

Not My Fault: From Charles II to Charles III: a British legacy of support for science

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As Queen Elizabeth lies in State, I have been thinking all things British. Our daughter Clara did her undergraduate studies in London, and we visited at least once a year between 2007 and 2013.

We did so much in London – opera, theatre, museums, markets. We ventured north for hiking and even tried out a canal boat in Bath. But my favorite place was Greenwich, not surprising as that was where we spent the most time while our daughter attended Trinity College of Music, a music conservatory that occupies Greenwich’s King Charles Court (commissioned by the last King Charles in 1660).

It never became the palace that Charles II had planned, but rather a hospital for wounded sailors. In the 19th century, the building was incorporated into the Royal Naval College, arguably the best-preserved baroque complex anywhere in the world. I’m sure you’ve seen the buildings as they provide the backdrop for more than 50 films and TV series including *Les Miz*, *Pirates of the Caribbean III*, and *Bridgerton*.

There is so much history here that the whole of “Maritime Greenwich” was declared a World Heritage site in 1997. King Charles Court was built near the foundations of the much older Tudor palace where Henry VIII, Mary I, and Elizabeth I were born. Admiral Nelson lay in state in the Naval College’s Painted Hall after succumbing to wounds in his victorious Battle of Trafalgar in 1805. We sat close to the spot where his catafalque rested when Clara graduated in 2013.

Greenwich Park was established in the 15th century in the hills above the Royal Naval College. Charles II commissioned construction of the Greenwich Observatory in 1675. Tourists visiting the Observatory today are told that it was the first structure in Britain built purposely specifically for science.

Greenwich gives clues as to how a small island nation came to dominate much of the world. The Naval College and the Greenwich Observatory provided the underpinnings of Britain’s rise as a naval power. The legacy remains today through the prime meridian and universal coordinated time (UTC). The day still dawns at Greenwich.

Britain was a relative latecomer to ocean exploration. A fascinating account of the Royal Navy’s rise is given in Arthur Herman’s book “How the British Navy Shaped the Modern World.” Spain and Portugal were the dominant naval powers well into the 16th century, with Britain using ships as troop transport and not as a tactical weapon.

That changes during the reign of Elizabeth I and the subsequent growth of British overseas trading companies. The pirating exploits of Francis Drake and the defeat of the Spanish Armada give rise to the study of naval warfare as a science. Unlike Spain and Portugal where sea commerce was driven solely for the enrichment of the crown, in Britain, private corporations become the primary motive for naval supremacy. The East India Company was formed in 1600 and the footholds established in Southeast Asia would become the nucleus of the British Empire. Sir Walter Raleigh in the late 16th century wrote, "Whosoever commands the sea, commands the trade; whosoever commands the trade of the world commands the riches of the world, and consequently the world itself."

According to Herman, Britain simply outspent other world powers to naval supremacy. The Naval College is one sign of this investment. But the British also invested in the science of navigation. Greenwich Observatory was built for the specific purpose: to reduce shipwrecks. This required astronomy and detailed mapping of star positions.

The global coordinate system goes back to the Greeks. Eratosthenes proposed the concepts of latitude and longitude in the 3rd century BCE. Latitude, the position north or south of the equator, was a relatively simple trigonometry calculation and could be determined by triangulating the positions of the sun and stars. Longitude, positions east and west, was easy enough to determine on land; you simply walked the distances. But it was far more challenging in the ocean where distances were much more difficult to measure.

The British government established the Longitude rewards competition in 1714 to stimulate research and a solution to the longitude at sea problem. Many astronomers tackled the problem, but it was clockmaker John Harrison who finally came up with an accurate resolution.

Harrison's solution is a bit like a word problem in math. Distance equals speed over time. If you know the time where you are (from the noon sun for example), and you know your speed, you can figure out how far away you are from a harbor if you know the difference between your time and the time in the harbor. If a ship sets a Harrison clock to the time in Greenwich and keeps it running the whole trip. They note noontime while at sea then measure the difference between the two times. Voila!

We toured the chronometer room in the Greenwich Observatory which features John Harrison's clocks. They are beautiful intricate devices that had to measure time accurately in an environment of changing temperatures and pressures and a heaving ship. If you can't make it to Greenwich, I highly recommend David Sobel's book "Longitude: The True Story of a Lone Genius Who Solved the Greatest Scientific Problem of His Time."

Many factors contributed to the rise of British naval supremacy. I believe Charles II had much to do with creating an environment for science and research. He is a fascinating monarch. One who had to tiptoe lightly considering the demise of his father Charles I who lost his head in the Civil War. He not only commissioned the Greenwich Observatory but in 1660 granted the charter for the Royal Society, an organization supporting the sciences that continues to flourish to this day. Today's patron of the Royal Society is Charles III.

Charles III inherits a very different nation than Charles II, with far less power to make change. But he does have a bully pulpit. Called "the climate king" by some in the media for his five decades of environmental activism, he may use his voice more vociferously than his mother to address climate change, carrying on the legacy of his 17th century predecessor in supporting science for humanity.

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