John Winthrop IV (1714-1779), is known today primarily as an astronomer, mainly for discovering one of the moons of Jupiter. He was one of the few American scientists from the Colonial Era to make contributions to astronomy using precise spherical trigonometry. Winthrop was one of 16 children in a distinguished family that traced its roots a century earlier, when his great-great-grandfather of the same name was a founder of the Massachusetts Bay Colony. A child prodigy who entered Harvard in 1728 at age 13 just when Greenwood began lecturing at the College, Winthrop received his A.B. four years later, finishing as class valedictorian. He returned to Cambridge in the fall to continue his studies, which culminated with a master’s degree in 1735 based on his disputation that it is not permissible for magistrates to impose hardships on anyone who maintained his own religious views. This was the first public sign of a protest against then prevailing Puritanical beliefs.

Three years later, in 1738, Harvard sought a notable scientist to succeed Isaac Greenwood as “Hollisian Professor of the Mathematicks and of natural and Experimental Philosophy.” The Corporation rejected longtime Tutor Nathan Prince because his vices extended even beyond Greenwood’s faults. Instead, that August the Corporation elected the 23-year-old intellect John Winthrop, although he still had to pass muster by two committees. In October a committee was chosen to test him “as to his knowledge of Mathematicks.” Two weeks later this group reported that he showed “very great proficiency … [and was] wel qualified to Sustain the office.” Fortunately, given his nontraditional views, the Board rejected a motion for a second committee to examine his principles of religion and instead ratified his appointment in December 1738, one day before he turned 24. The installation took place in January in a public gathering where Winthrop promised to abide by the stipulated rules of the Hollis professorship. He then delivered his inaugural oration—in Latin. Unlike his predecessor, he held the position a long time, 41 years altogether. Only one person publically opposed Winthrop’s election—the disappointed Nathan Prince.”

On the contrary, John Winthrop took the responsibilities of this chair very seriously. In addition to teaching such topics as plane and spherical trigonometry, mensuration of solids, and conic sections, he set about mastering Newton’s Principia Mathematica, thereby becoming one of the very few Americans able to understand calculus. Harvard records indicate that he lectured on the method of fluxions as early as 1751, thus adopting the terminology of Newton instead of
Leibniz. In a document from 1764 Winthrop defined the mathematical areas that the Hollis Professor should teach: geometry, algebra, conic sections, and plane and spherical trigonometry. Although calculus is not included in this list, his inventory contained areas of remarkable scope—the natural sciences (pneumatics, hydrostatics, mechanics, statics, and optics), principles of astronomy and geography, calculations of the movements of heavenly bodies, principles of a sundial, and the arts of navigation and surveying. This striking breadth is reinforced by some of the volumes contained in his personal library, which included works by Barrow, Descartes, Huygens, and Maclaurin as well as Newton.

The main mission of a Harvard professor at the time was teaching so Winthrop had to carve out time for his scientific endeavors from these duties as well as personal responsibilities. In 1746 he married Elizabeth Townsend. Her stepfather was Charles Chauncy, a 1721 Harvard graduate whose great-grandfather of the same name was the second president of the College a century earlier. This couple thus represented a generation of colonialists that was inching farther and farther away from Great Britain.

Winthrop also mentored students in the laboratory located on the second floor of Old Harvard, where he “established for the first time America’s independence in scientific development, and also gave to Harvard College her early prominence in scientific investigations.” The modern laboratory, as we know it today, did not exist then so students were reduced to observing experiments without actively engaging in them. Equipment was just not generally available, even to the professor of natural philosophy. Yet in 1746 Winthrop gave the first practical demonstration of electricity and magnetism in America, using instruments that were obtained for him from London by none other than Benjamin Franklin. This emerging breed of American scientist felt no need to travel abroad for education or for research.

Socially Winthrop was a product of his era in another way. Although a slave owner, he was aghast at the spectacle of a slave woman burning at the stake for murdering her master. A historian from fifty years ago reported, “When his own slave boy, George, died of the measles, he was mourned as one of the family, not as an unfortunate investment. His successor, Scipio, was watched over like the white children of the family.”

Winthrop’s wife died suddenly in 1753. To overcome loneliness, he began to visit other colonial scientists he had only corresponded with beforehand. One year later, for instance, a journey took him to Yale to meet William Johnson, to Princeton, then located in Newark, to visit
President Burr, and to Philadelphia to meet with Benjamin Franklin and his compatriots in the American Philosophical Society.

Back in Cambridge in 1756, Winthrop married the widow Hannah Fayerweather Tolman, whose brother had graduated from Harvard in 1743. Hannah Winthrop was “a geyser of patriotism” even though her husband initially supported strong ties to Great Britain. He opposed a movement to form an American “Philosophic Society” beyond the one foundering in Philadelphia because “our Country has hardly arrived yet to a state of maturity” like the Royal Society in London. However, during the war scare of 1759, he agreed to the Massachusetts Bay Colony governor’s request to update the Admiralty chart of Boston harbor that had been made in 1705. And Winthrop became indignant at the subsequent Stamp Act and Massacre, which compelled him to add his name to the list of candidates for Province Council in 1773. His reply to Benjamin Franklin’s congratulatory letter upon his successful election evinced an ability in matters political as well as scientific: “If the Ministry are determin’d to inforce these Measures, I dread the Consequences: I verily fear they will turn America into a field of blood.” By this time John Winthrop’s patriotism matched his wife Hannah’s, and his bold public pronouncements on redressing perceived injustices made him a popular figure.

Yet Winthrop was as uncomfortable in this role as he had been in administrative affairs at Harvard. When President Edward Holyoke died in 1769, the Hollis professor resisted the call to assume the reins long enough until Samuel Locke was selected a year later. But that administration ended badly during four years. By that time Winthrop’s political activities amidst debilitating effects of asthma obliged him to resist firmly once again, and he was delighted when Isaac Greenwood’s protégé Samuel Langdon accepted nine months later.

In April 1776 Winthrop wrote to John Adams in Philadelphia, where utterances of independence still remained whispered, “Our people are impatiently waiting for the Congress to declare off from Great Britain. If they should not do it pretty soon, I am not sure but this colony will do it for themselves. Pray, how would such a step be relished by the Congress.” Congress declared Independence three months later. The resulting war was hard on the Winthrop family as well as Harvard College. He and his family first moved to the Fresh Pond area of Cambridge, located a distance away from the fighting in Boston. Then they moved farther, to Andover, where skirmishes with British troops occurred before independence was declared. However, when Harvard prepared to move to Concord, the Winthrops returned to Cambridge to pack the
scientific apparatus and books in the library. In Concord, they occupied a structure that came to be called the Nathaniel Hawthorne house in 1852.

By late 1778 Harvard had relocated back to Cambridge and the Winthrops returned to their little wooden house nearby. But John Winthrop’s physical condition worsened and he died the next May, deprived of seeing the Colonies’ ultimate victory and participating in the critical Constitutional Convention. Forty years earlier, just a year after assuming the Hollis professorship, he had observed sun spots that led to his first known scientific investigation. The notes he recorded on that occasion were transcribed by the prominent Harvard librarian Frederick G. Kilgour. Winthrop began (the italics are his):

1739 April 19th at Boston. Walking on the Common a little before sunset, the air being so hazy that I was able to look on the sun, I plainly saw with my naked eye a very large and remarkable spot. Its shape was oblong and the length of it was perpendicular to the horizon. I observed it several minutes till the sun was actually set. … The next day, Friday, coming back to Cambridge, I looked at the sun with an 8 foot telescope from 6 A.M. till sunset and discovered not only the same spot which I saw before but several others in his disk.

Winthrop’s notes afford the modern reader an appreciation of how long such observations took. From our vantage point, the observations themselves are not the essence—rather it is the drawing of a conclusion from the evidence and then the establishment of a proof for its theoretical underpinning. The notes suggest a connection between sun spot activity and the aurora borealis, which addresses the issue of isolating a conclusion from observations, but there is no record of Winthrop following up this study; it was not until the middle of the 19th century that Joseph Lovering and Elias Loomis helped establish the relationship between sun spots and auroras.

John Winthrop began his astronomy investigations in 1739 with a telescope that Thomas Hollis himself had obtained from the famous astronomer Edmund Halley. That instrument enabled Winthrop to observe a solar eclipse and to become the first American to view the transit of Mercury. His findings were published in the *Philosophical Transactions* of the Royal Society. Because this scientific periodical became such an important outlet for Winthrop’s research, we turn to it now before discussing his published scientific work.
Endnotes:


6 As quoted on *Ibid*, p. 368.


8 Frederick G. Kilgour, Professor John Winthrop’s notes on sun spot observations (1739), *Isis* 29 (1938), 355-361.