Fire and Ice: The Reverend George Fisher, RN, Arctic Scientist and Educator

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Fire and ice – an unheard of mixture, but this whimsical phrase aptly fits George Fisher's life from his teenage years through early adulthood.

Fisher was born on the last day of July 1794, in Sunbury, Middlesex, England, the son of surveyor James Fisher and his wife Henrietta. When James died three years later, Henrietta was left to raise a large family. Having received little early education, by the age of 14 George entered the office of the Westminster Fire Insurance Company in 1808 – humble beginnings that were to have monumental consequences for the young man.

The Fire Office

In that day, each of the insurance companies, or fire offices, established fire brigades. Firemen were paid a set retainer, plus extra for attending training and fires. The London insurance companies hired their firemen almost exclusively from the watermen who operated water taxis on the Thames.

In addition to firemen, companies also hired porters, who were responsible for salvage at fires. Fisher was a clerk, and may also have been a porter; his "devotion to uncongenial duties won the respect and rewards of his employers." This was in part a medallic reward, as he was honored with a silver medal from his masters.

At one of the firm's very early meetings, it was determined that its symbol would be the "Portcullis and Plume and Feathers." Consequently, the obverse of Fisher's 40 mm medal features a portcullis atop a rectangular base. A portcullis was a heavy iron grating which hung in or over the gateway of a medieval castle or fortress, and was lowered by chains to prevent the entrance of an enemy. The portcullis image was borrowed from the crest of the town of Westminster, while the tuft of feathers in a crown come from the arms of the Prince of Wales (later King George II). Interestingly, the Prince actually once helped battle a fire at the French Chapel and Library, in Spring Gardens, near Westminster. A sturdy rectangular base displays the word "ESTABLISHED," with the date "MDCCXVII" (1717) below, and the designer's initials "I.P." immediately below. The whole design being encircled by "WESTMINSTER FIRE OFFICE". The reverse displays engraved script and Old English lettering, framed within an oak wreath: "M^{r} George/Fisher/Elected/17th Aug.^{t} 1809". At the base of the wreath is "I.P.," the designer's initials.

These fire medals are quite rare, and the author has spied only a few examples over many years; notably, they were sometimes also issued in gold to directors of the company.

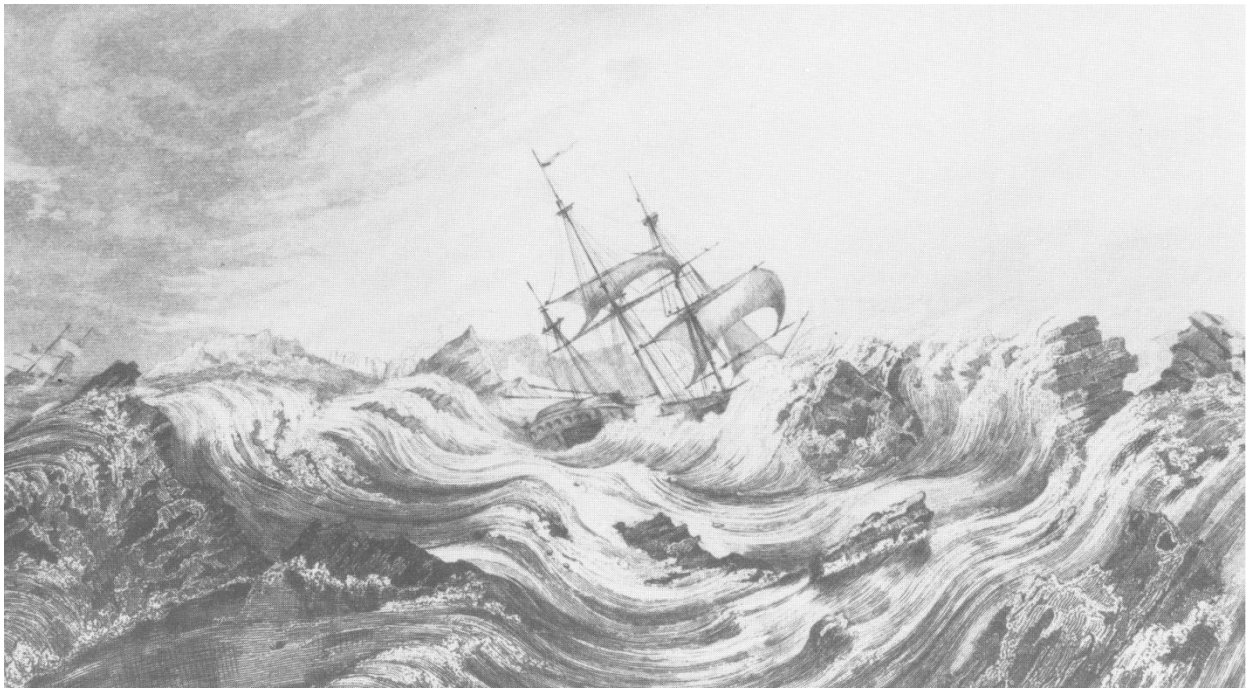
The Westminster Fire Office Medal and Arctic Medal 1818-55 (unnamed) of the Reverend George Fisher, FRS, FRAS. (courtesy of DNW auctions, London, 2008; ex-Glenn M. Stein Collection)

Through the Fire Office, Fisher came in contact with some of the eminent scientists of his day, including the likes of the chemist Sir Humphry Davy and naturalist and botanist Sir Joseph Banks, who were just two of the many who fostered Fisher's "ardent desire for knowledge [and] strong mathematical and scientific tastes". At the time, a clerical appointment was a typical path to a university assignment, and young Fisher entered St. Catherine's College, Cambridge, in 1817.

North Towards the Pole

Fisher's studies were interrupted by serious illness, which continued to plague him in later years, but the ardent student persevered, and excelled to such an extent that he garnered an appointment as one of two astronomers on a forthcoming Arctic expedition. The recommendation came from none other than the President and Council of the Royal Society, a learned organization for science founded in 1660. The Society claims to be the oldest such organization still in existence, and is a voluntary body, operating as the academy of sciences of the United Kingdom and the Commonwealth.

In part, the expedition grew out of reports from Greenland whalers that open water extended much further north in 1816 and 1817 than in previous years, and the Admiralty dispatched four ships on April 25, 1818: HMS *Alexander* and HMS *Isabella* sought the North-West Passage, while HMS *Trent* and HMS *Dorothea* (Fisher's ship) were ordered to sail over the very top of the globe. Fisher's branch sought to jump off from the Svalbard Islands (located some 500 miles north of Norway), sail northward to reach the Bering Strait, and then on to the Pacific Ocean. This chosen course was due to the belief in an Open Polar Sea. This theory persisted even until the final decades of the nineteenth century, with some people believing that, while the Arctic was ringed by ice, if one could navigate through the ice it was possible to cross an ice-free Arctic Ocean, and even sail across the North Pole.



HMS *Dorothea* in the Arctic – a somewhat fanciful image from a sketch by Lieutenant Beechey. (Beechey, 1843)

Within Admiralty instructions for the expedition, it was obvious the Royal Society placed great faith in "Mr. Fisher, who is represented to us as a gentleman well skilled in Astronomy, Natural History, and various branches of knowledge". He was provided with instruments to make observations concerning the length of a pendulum vibrating seconds – for the determination of the Earth's shape – and to make other scientific observations.

Just four months prior to the expedition's departure, the first edition of Mary Shelley's novel *Frankenstein* was published anonymously in London. Fictional explorer Robert Walton's meeting of Frankenstein while on a North Pole expedition was not part of the narrative frame in Shelley's first draft in the summer of 1816. This polar element was added in some form sometime between September/October 1816 and April 1817, during a period "when both the history and the future of polar exploration were subject to increasingly fervent discussion in scientific circles and popular journals in England."

Shelley understood that expeditions of the late 18th and early 19th centuries "carried a dedicated scientist on board who worked to understand the behavior of the compass in the polar regions and to make notes on arctic flora and fauna." To this end, "she has Walton list the scientific justifications for his expedition: "I may there [at the North Pole,] discover the wondrous power which attracts the needle; and may regulate a thousand celestial observations, that require only this voyage to render their seeming eccentricities consistent forever.""

The passionate Walton also hungered for glory on his quest, but became cocky, and believed his sheer force of will could defeat the ice that locked the ship in its grip. Eventually learning to temper his desire for glory, in order to protect those for whom he was responsible, Walton decided to escape the crystal prison and sail for home – a lesson Victor Frankenstein did not grasp until it was too late.

The *Trent* and *Dorothea* reached their rendezvous at the northwestern point of Spitsbergen Island, and after surveying the harbor, the ships left on June 7, but were soon trapped and helplessly adrift. After eventually finding refuge at Fair Haven, another attempt by the pair on July 6 penetrated to 80º 34'N – their farthest northern point on the voyage – but here a mass of white boulders blocked any further progress, as they were again surrounded by menacing giants.

The expedition beset in ice off Red Hill [Bay], June 4, 1818, from a sketch by Lieutenant Beechey. (Beechey, 1843)

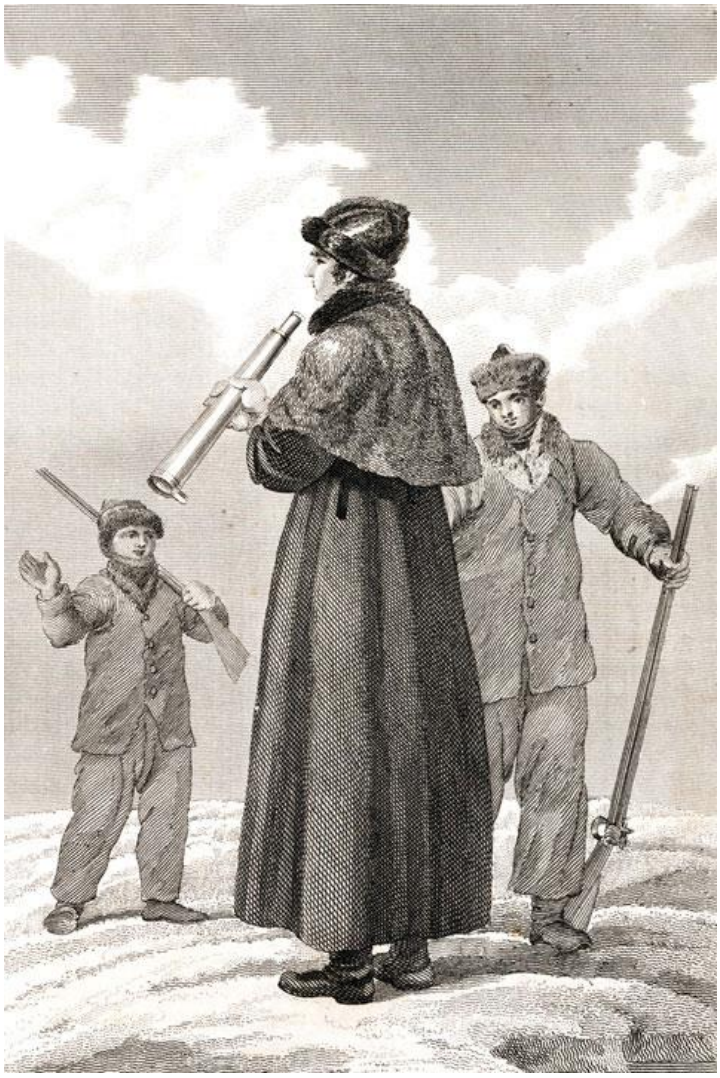
After the explorers freed their vessels, a gale sprang up, causing severe damage to their wooden homes. Retreating to Fair Haven, temporary repairs were carried out, and the expedition sailed for home on August 30. Never again did any Royal Navy vessels attempt to sail across the Arctic Ocean.

In spite of the unforgiving ice and sea, based on experiments on the length of the pendulum at Spitsbergen, Fisher reaped a scientific harvest from the experience. An abstract of these experiments eventually saw print in an appendix of *A Voyage of Discovery Towards The North Pole*, written by the *Trent*'s artistically talented Lieutenant Frederick W. Beechey. In addition, the results of Fisher's observations of the ships' chronometers were embodied in his paper, "On the Errors in Longitude as determined by Chronometers at Sea, arising from the Action of the Iron in the Ships upon the Chronometers," which he read before the Royal Society on June 8, 1820.

Polar Chaplain and Astronomer

Shaking off his harrowing experience in the icy deep blue, Fisher returned to St. Catherine's College to earn his BA in 1821 (and afterwards an MA in 1825). He also appears to have specially taken Holy Orders to become a naval chaplain, thus entering a select group. There were not enough chaplains for shrunken post-Napoleonic War requirements, and as a result, in 1820 the Navy Board decided to "encourage" chaplains to volunteer. The approach taken was recommending to the Church that it should grant "acting orders" to deacons, who would in turn be accepted for service in the Navy. In general, however, the Board declared it desirable that candidates should be in priest's orders. In spite of this effort, by 1824, the whole chaplains' list consisted of only 17 "retired" and 39 "active" names in all.

After becoming the Reverend George Fisher, R.N., the Frozen Zone beckoned the holy man once again. As before, he was recommended by the Royal Society to be the astronomer for an Arctic expedition, this time on William Parry's second attempt at sailing a North-West Passage.



Winter dress of officers and men on British Arctic expeditions of the period. (Anonymous, 1821)

In April 1821, HMS *Fury* (Fisher's ship) and HMS *Hecla* were sent by the Admiralty to search for a passage along the west coast of the unknown Foxe Basin (northernmost Hudson Bay), north of Repulse Bay. Parry became the first to sail through Frozen Strait, and by late August, finding no way through Repulse Bay, he probed the fringes of Melville Peninsula northward.

Hudson Bay, Foxe Basin and Baffin Island (Mills, vol. 1, 2003)

Haviland Bay, Bushnan and Vansittart Islands, Gore Bay and Lyon and Hoppner Islets were some of the new features affixed to European maps during this time. Sailing as far as Ross Bay by boat, the two inlets were scrutinized before it was decided to make winter quarters off southeast Melville Peninsula, at Winter Island.

Cutting into Winter Island, October 1821. (Lyon, 1824)

A portable observatory, embarked on the *Fury*, was set up ashore during the winter and Fisher had supernumerary able seaman Henry Siggers as his servant. Numerous wide-ranging experiments were conducted; among them were those of value to navigators in high latitudes, including comparative tests of compasses and numerous observations to determine refraction when stars were observed near the horizon in very cold weather. He also measured the velocity of sound, the contraction of a series of different metal bars at low temperatures, and the behaviors of various chemicals. In fact, the following year, Fisher's discovery of the liquefaction of gases (especially chlorine) took place – one year before the noted English chemist and physicist Michael Faraday, who is usually credited with being the first to liquefy chlorine. History is sometimes blind to achievements in far-off places.

The importance of a careful study of Inuit culture was not lost to Parry and his men, and they made detailed observations from the time the Inuit visited the ships on February 1 throughout the winter. After breaking out of winter quarters on the second day of July, it was an Inuit map of the region that guided the expedition northward, until the Inuit were again encountered at Igloolik.

Pressing farther north, the entrance to Fury and Hecla Strait unfolded before Parry, but a wall of ice barred his way. Not to be outdone, Parry struck out overland and confirmed the strait led west into open sea – “in fact, this was the entrance to the southernmost possible North-West Passage (but modern knowledge confirms that ice conditions made it impassible to sailing vessels).”

Parry returned to Igloolik Island and established winter quarters at that place, where the expedition again had close contact with the Inuit during the winter of 1822-23. Fisher once more set up the portable observatory ashore, and patiently continued his valuable experiments.

(top) Inuit braced to haul in a harpooned walrus, (bottom) Eskimo sleds. (Parry, 1824)

Leaving winter quarters in August 1823, Parry made a second unsuccessful attempt to sail through Fury and Hecla Strait, but the fear of scurvy plagued his mind, so he abandoned the effort and returned home. This was the last major attempt to find the North-West Passage through Hudson Bay, and the search for an elusive passage continued in more northern latitudes.

Parry's journal specifically praised Reverend Fisher's advancements in the departments of science:

I have the most sincere pleasure in offering my testimony to the unabated zeal and perseverance with which under circumstances of no ordinary difficulty from climate, and in spite of frequent ill health, he continued to pursue every object which could tend to the improvement of Astronomy and Navigation, and to the interests of Science in general.

Indeed, the last 300 pages of Parry's 800-page published journal contain observations of weather, position and astronomy by Reverend Fisher. As a testament to his fine work, Cape Fisher, on the southwest end of Winter Island, was named in his honor.

Over the course of two Arctic expeditions, Fisher had conducted pioneering work on the physical, chemical and physiological consequences of the Arctic climate. Even the cause of an Arctic splendor – the *Aurora Borealis* – was theorized on by Fisher, who clung to the general belief that the *Aurora* was an electrical phenomenon. Like his contemporaries, he had no inkling that its true origin was a stream of ionized solar particles made visible upon reaching Earth's atmosphere.

High Honors and the Royal Hospital School at Greenwich

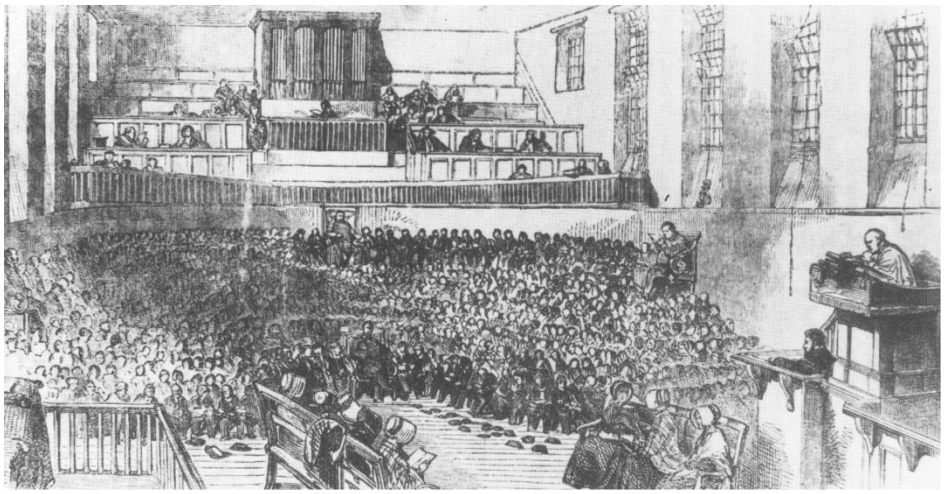
Fisher's scientific diligence paid off, and at only 31 years of age he was elected a Fellow of the Royal Society (FRS) in 1825. In that same year, he became the Chaplain of Stansted, Essex. Two years later, he was also elected a Fellow of the Royal Astronomical Society (FRAS), and became the Chaplain of Ampthill, Bedfordshire. Fisher several times acted as Vice President of the latter organization and was a member of the council from 1835 until 1863. Though Fisher was also made a Fellow of the Royal Geographical Society (FRGS) in 1830, he resigned in 1840.

From 1827 to 1831, Reverend Fisher was employed as Chaplain to HMS *Spartiate* (1827-30) and *Asia* (1831), continuing his magnetic observations in London, Ryde, Malta and various ports on the coast of the Mediterranean. On his return, he was assigned to HMS *Victory* at Portsmouth from 1832-33, after which he retired from the Navy on half-pay.

Various biographical sources state that in 1834, Lord Auckland (First Lord of the Admiralty) offered Fisher the choice between living in the village of Falstone, Northumberland, or the Chaplaincy and Headmastership of the Royal Hospital School at Greenwich, and he took up the latter appointment of the Upper School on Dec. 4, 1834.

The children of officers and men of the Royal Navy, Royal Marines, and the Merchant Service, were clothed, boarded and educated in two separate schools of the Royal Hospital School, the Upper School and Lower School; and there was also a girls' school. Boys in the Upper School

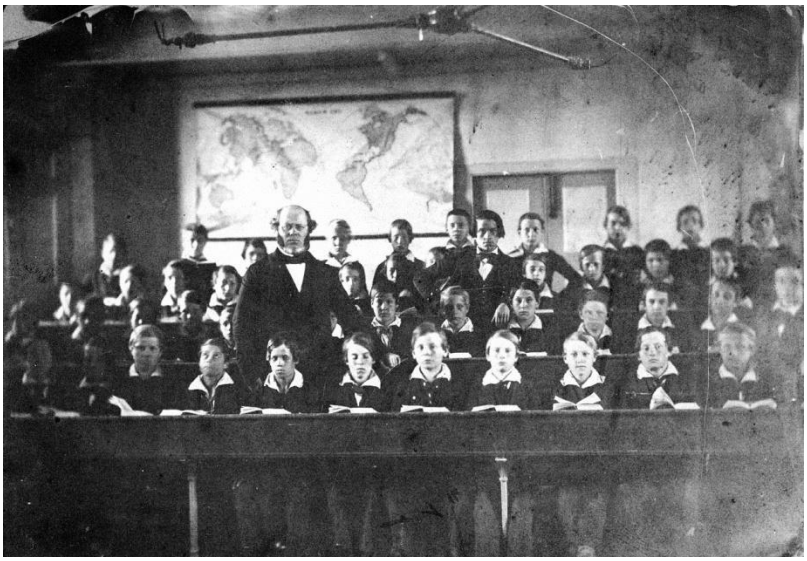
trained to become officers in the Royal Navy and Merchant Service, while those in the Lower School became naval sailors, and the girls were destined for domestic service.



The Royal Hospital School Chapel in the West Wing, c. 1845. (Turner, 1990)

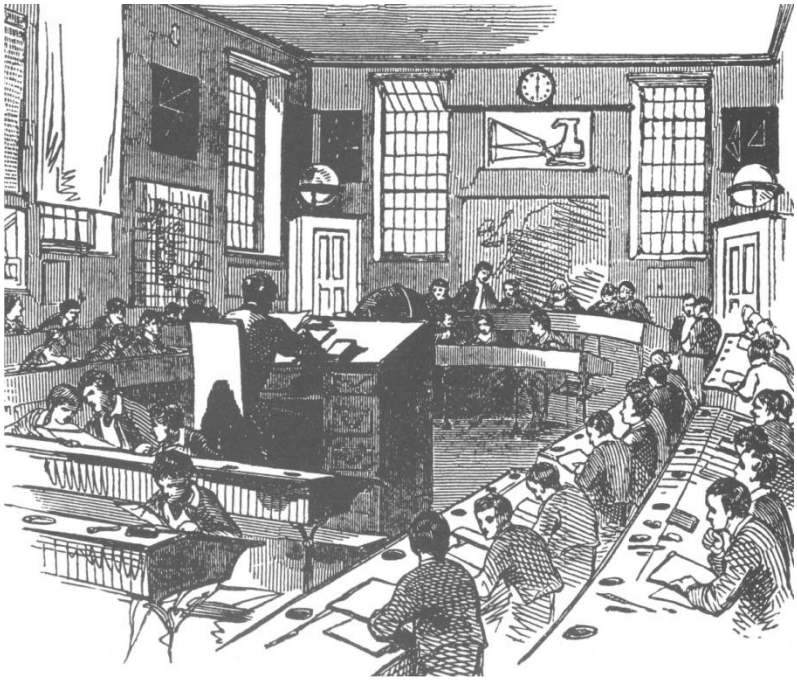
In July of 1837, Fisher married Elizabeth Alicia Woosnam, and they had two daughters and a son, but Elizabeth died in 1846 when only 38 years of age. The eldest daughter, Alice Fisher (1839-88), took up nursing in 1873, at the late age of 34. In a dramatic personal move, she traveled across the Atlantic to occupy the superintendent's post at the Philadelphia Hospital in Pennsylvania, USA, in November 1884, but passed away only four years later.

In 1840, Fisher was criticized by the Earl of Minto, Admiral Sir Charles Adam, KCB, Lieutenant Governor of Greenwich Hospital, for neglecting his spiritual duties. The following year, Edward Riddle was appointed Headmaster of the Upper School, while Fisher was still the overall Headmaster and Chaplain. During the same year the girls' school was closed.



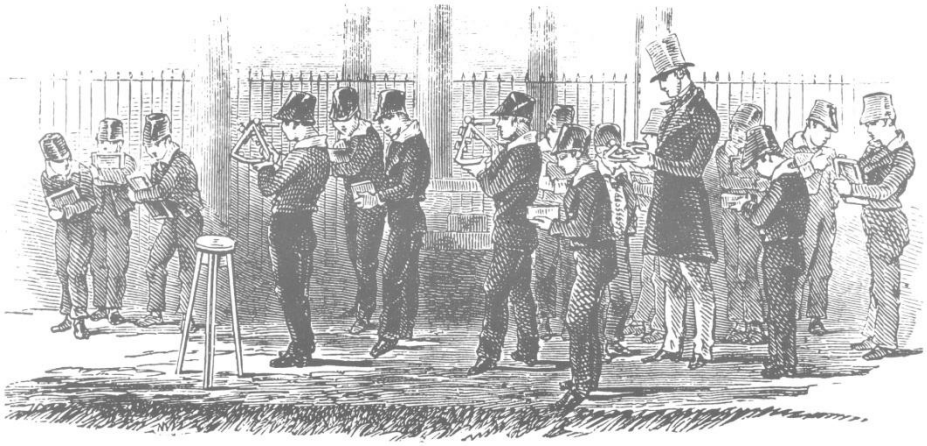
Headmaster John Riddle, with his pupils, 1855 (The Arts Council of Great Britain postcard, 1970s)

Edward Riddle, FRAS (1786-1854), was an astronomer, mathematician and teacher of navigation. A highly esteemed educator, his authoritative and important 1824 work, *Treatise on Navigation and Nautical Astronomy, Etc.,* was used throughout the world, and ran to eight editions. Edward's only son, John Riddle, FRAS (1816-62) was also an astronomer, mathematician, and teacher of navigation, and became his father's successor as Headmaster of the Nautical School. Royal Hospital School Archivist Professor Bernard de Neumann sheds further light on one aspect of the senior Riddle's work: "Edward Riddle did much research during his time at Greenwich into what we today call computational complexity, and which nowadays is used to study the efficiency of computer algorithms. Before the days of electronic, or even mechanical computers, his work attempted to minimize the "computational effort" required of navigators, and the physical effort of lugging around large books of trigonometric and logarithmic tables, that were a prerequisite to handling the navigational transforms."



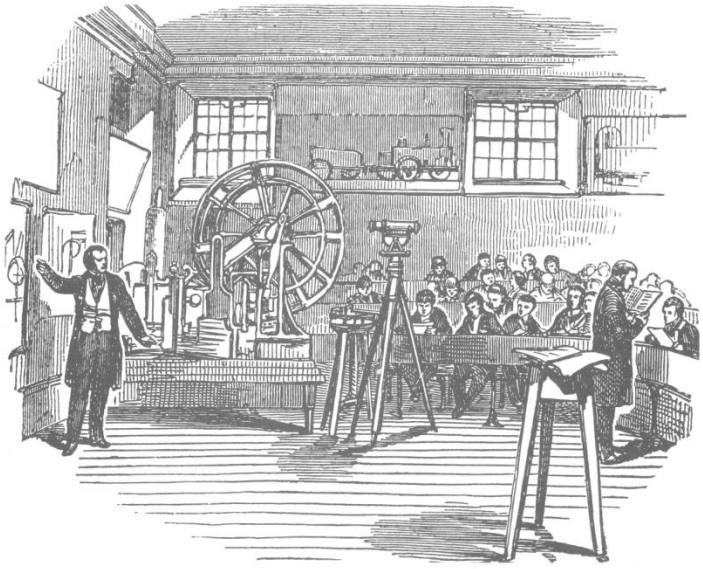
Upper School – the Reverend J. Hill's classroom, Mathematics and Optics, 1848.
(*The Illustrated London News*, Feb. 19, 1848)

The Headmastership of the Lower School was vacant, and Riddle moved to the Headmastership of the Nautical School (a new higher school to instruct 200 of the ablest pupils). As *The Illustrated London News* reported in 1848, "The [Nautical School] course includes Algebra, Plane and Spherical Trigonometry, (both theoretical and practical), Navigation and Nautical Astronomy; instruction in the use of the Sextant, Reflecting Circle, Azimuth Compass, and the Artificial Horizon, and the number of Observations recorded, is, at least, 100,000 per annum." Two newcomers, William Graham and Thomas Irvine, became Headmasters of the Upper and Lower Schools respectively.



Taking and recording sextant observations, 1848. (*The Illustrated London News*, Feb. 19, 1848)

Following a reorganization in 1848, and in acknowledgement of his pioneering work in numerical educational attainment assessment, Fisher was made Principal, while retaining his post as Chaplain. His contributions extended to writing textbooks on algebra and geometry, in order to introduce modern methods into the school, and Fisher's books led Edward Riddle to drop his coverage of these mathematical aspects from his book. Much of Fisher's work was statistical in nature, which he applied to such problems as measuring the effect of iron on chronometers. Fisher also worked with Riddle to plan a new astronomical observatory for the school, which was begun early in 1849, but not completed and in full operation until the summer of 1859. Fisher supervised its use, and observed the solar eclipse of July 18, 1860. In that same month, the schools were reorganized into the Nautical School, and Sections A, B, C, each with their own Headmaster, and Fisher was appointed Principal Master, in overall charge of teaching.



Lower School – a lesson on steam machinery (Mr. E. Hughes, Headmaster), 1848.
(*The Illustrated London News*, Feb. 19, 1848)

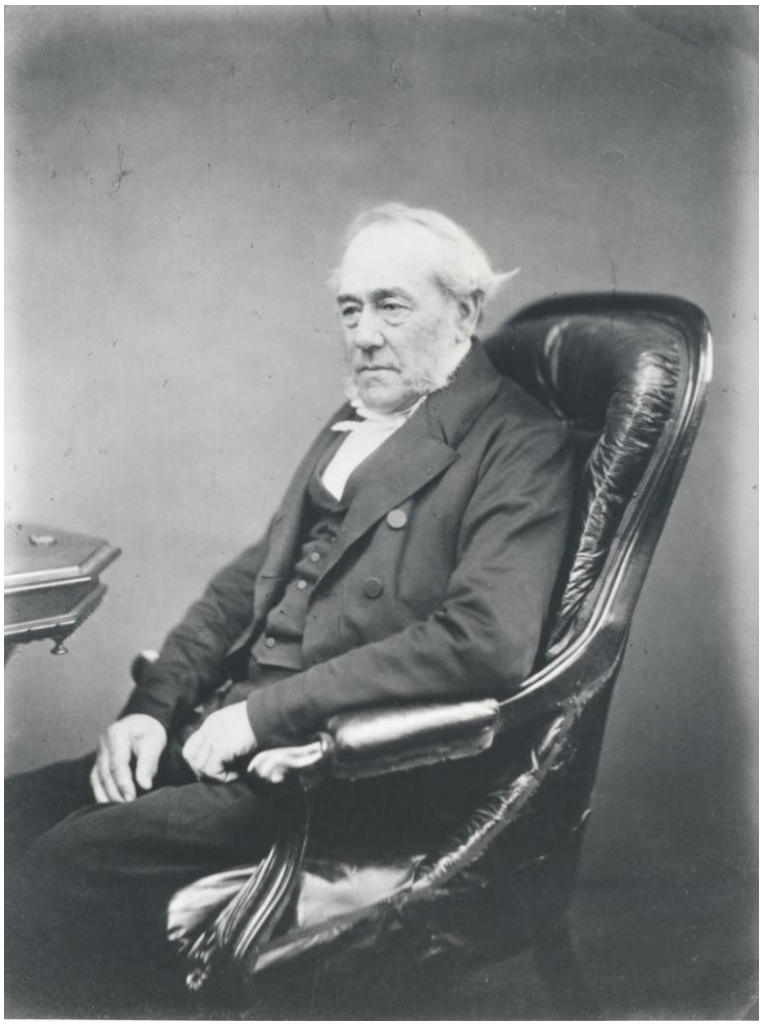
Many years before, Fisher had found an institution in much need of guidance, but by his fortitude in carrying out schemes for the good of the establishment, “his calm demeanour, his tact and even-handed justice,” the Royal Hospital School became what one professor described as “second to no other similar school in Europe,” assuming a highly practical character as a “hot-bed of navigation”. It was supplying other navigation schools with teachers, who in turn filled the ranks of the Merchant Service and Royal Navy (along with naval instructors for the latter). Quite a number of former students took part in surveying and explorative expeditions, as trained navigators, surveyors, and astronomers (also being a traditional source of human computers for the Royal Observatory, Greenwich). Notably, two former students were explorers lost on the Franklin Expedition: Second Master Henry Foster Collins (*Erebus*) and Second Master Gillies Alexander Macbean (*Terror*).

Arctic Honor

Fisher claimed his Arctic Medal 1818-55 in May 1857, and along with the Fire Office medal, these were his only medallic entitlements. He had the distinction of being the only chaplain entitled to the first Arctic award, and one of only two astronomers – the other being Major General Edward Sabine, RA (1788-1883), a veteran of three expeditions.

The author originally acquired the pair of medals in October 1992, from the late Len Matthews, a well known and highly respected British collector and researcher. Matthews related how he purchased the medals in a London charity auction during the summer of 1990, having discovered them at the bottom of a box of family documents, with no other material relating to them

The Arctic Medal 1818-1855 (unnamed) attributed to Fisher. (courtesy of DNW auctions, London, 2008; ex-Glenn M. Stein Collection)



The Reverend George Fisher, FRS, FRAS, c. 1860. (courtesy of The Royal Society)

The Twilight

Fisher retired in 1863, sold many of his books, and moved to Rugby, Warwickshire. During his later years, the Reverend continued to contribute to practical knowledge by publishing a valuable paper within the seventh edition of Edward Riddle's *Navigation*, entitled "Circular Arc Sailing," "a highly practical and instructive attempt to modify great Circle Sailing when the latitude into which a ship would be led is so high as to render navigation dangerous."

Nearly 80 years of age, Reverend George Fisher passed away on May 14, 1873. "Always of singularly childlike and contented disposition, the companionship of those dearest to him, and his books, were all he needed for happiness," noted one obituarist.

Fisher's most lasting achievement – for which he is still recognized – was his idea to evaluate and measure the attainment and progress of his pupils numerically, a system which, with some modification and extensions, remains in use today throughout the world. Thankfully for posterity, his granddaughter, Miss A.B. Darnell, also presented an extensive collection of his

scientific notes, observations, and Royal Hospital School letter books to the National Maritime Museum in 1958, in addition to his scientific instruments (which are held in the Museum's Navigation Department).

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