ALVAN CLARK AND HIS SONS

ALVAN GRAHAM CLARK AND GEORGE BASSETT CLARK

A. G. (ON THE LEFT)
ALVAN CLARK
G. B. (ON THE RIGHT)

MARCH 1804

March 8, Thursday: Alvan Clark was born in Ashfield, Massachusetts.

1808

November 30, Wednesday: Spanish forces trying to stop the French advance on Madrid were defeated at the Somosierra Pass.

Maria Pease was born.

Friend Stephen Wanton Gould wrote in his journal:

> *4th day 30 of 11 M / My H at her fathers, I dined at mine & took tea with her, buisily occupied at Trade thro' the day - Attended the funeral of John Bull a relation of my Mothers —*

RELIGIOUS SOCIETY OF FRIENDS

1809

November 20, Monday: George Gordon, Lord Byron and Hobhouse left Ætolikon and arrived in Missolonghi.

France ended its occupation of Vienna.

Mary Clark was born.[1]

Friend Stephen Wanton Gould wrote in his journal:

> *2nd day 20th of 11th Mo// Alass another day of my life has passed over, & what returns I have made to My God for the blessing I know not - tho' I do not feel that I have done any thing that is much amiss - It is a season of famine with me, I cannot get hold of any thing, or but little of any thing, that is food of heavenly kind, for the Mind, & if in this state I can be preserved from Sin I shall be thankful, for in those days of fast it is, that Satan is the most buisy. —*

RELIGIOUS SOCIETY OF FRIENDS

1826

March 26, Easter Sunday: Through the agency of Sir George Smart, a Dr. Severin went to see Carl Maria von Weber in London. The doctor told Weber not to worry and prescribed pills and a rabbit skin to be put on his chest.

A constitution for Brazil was promulgated. It provided for a hereditary monarchy and a bicameral parliament.

Alvan Clark got married with Maria Pease.

In Newport, Rhode Island, Friend Stephen Wanton Gould wrote in his journal:

> *1st day 26th of 3rd M 1826 / Yesterday Afternoon Our friend Thomas Anthony & Wm Reynolds came from Greenwich, took tea & lodged with us — they also Dined with us today & attended both our meetings - Thomas's ministry was as a refreshing rain on parched land - The hearts of the brethren were comforted & much refreshed thereby, & were thankful on his account as well as our own that there were evidences of life yet remaining — Thomas I have long known & loved he was an early correspondent of mine, in tender Years, when we took sweet council together. — We took tea at Father Rodmans with them, & then I waited on them to*

1. Don't you suppose this sister of Alvan Clark would have been the "Mary Clark" who was the author of A CONCISE HISTORY OF MASSACHUSETTS, FROM ITS FIRST SETTLEMENT. IN THE FORM OF QUESTION AND ANSWER (1830), BIOGRAPHICAL SKETCHES OF THE FATHERS OF NEW ENGLAND: INTENDED TO ACQUAINT YOUTH WITH THE LIVES, CHARACTERS AND SUFFERINGS OF THOSE WHO FOUNDED OUR CIVIL AND RELIGIOUS INSTITUTIONS (1836), and THE EARLY LIFE OF WASHINGTON: DESIGNED FOR THE INSTRUCTION AND AMUSEMENT OF THE YOUNG (1838)?

D Buffum from whence they went to J Dennis's

RELIGIOUS SOCIETY OF FRIENDS

1827

February 14, Wednesday: George Bassett Clark was born in Lowell, Massachusetts to Alvan Clark and Maria Pease Clark.

1832

July 10, Tuesday: Alvan Graham Clark was born in Fall River, Massachusetts to Alvan Clark and Maria Pease Clark.

Providence, Rhode Island doctors Joseph Mauran, Thomas H. Webb, and Samuel Boyd Tobey journeyed to the city of New-York expressly for the purpose of observing the outbreak of the Asiatic cholera there, in order to make recommendations as to how their own community might best respond to this threat.

The US Department of the Treasury revived the US Coastal Survey.

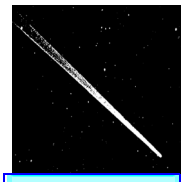
Samuel Sebastian Wesley was appointed organist at Hereford Cathedral. He would begin duties in September.

1843

March 22: Benjamin Peirce, the Perkins Professor of Astronomy and Mathematics, lectured on the topical topic of superstition and comets before a crowd of 1,000 in the Odeon Theatre in Boston. He jested that to some of us, such as the Millerite followers of the Reverend William Miller, such a new comet could be seen as prophesying "the end of all things to all of us," at least to the enlightened persons of his audience, "the generous spirits of Boston," it might be seen as prophesying the purchase of a decent telescope for Harvard College and a decent observatory in which to house it.[2]

The 15-inch telescope known as "The Great Refractor" that would be installed on Concord Avenue in Cambridge in 1847 would be ordered from Merz & Mahler of München, Germany during this year. For two decades this would be the largest and most significant telescope in the United States, equal to the finest in the world.[3]

An observer of the comet noted that "although the sky was very clear, the nucleus was with difficulty perceptible, from which it appeared that the comet was increasing its distance from us with immense rapidity." He indicated the tail extended about 37°.



SKY EVENT

2. Safe thoughts to contemplate, as this great comet which had been taken by some to prophesy the end of time was even then fading quickly into invisibility, with matters here on earth continuing to go on pretty much as before.

ASTRONOMY

3. It would be through detecting errors in the making of this fine instrument that the Clark firm of Boston would be emboldened to embark upon their career in telescope making.

ALVAN CLARK

1844

While his son George Bassett Clark was studying engineering, Alvan Clark developed an interest in the optics of large astronomical instruments.

A 5th edition of Ormsby McKnight Mitchel, A.M.'s revision to Elijah Hinsdale Burritt, A.M.'s THE GEOGRAPHY OF THE HEAVENS, AND CLASS BOOK OF ASTRONOMY; ACCOMPANIED BY A CELESTIAL ATLAS. BY ELIJAH H. BURRITT, A.M. FIFTH EDITION. WITH AN INTRODUCTION BY THOMAS DICK, LL.D., AUTHOR OF THE "CHRISTIAN PHILOSOPHER," &C (New York).

1846

The Clark family began the firm of Alvan Clark & Sons in Cambridge, Massachusetts, to develop and manufacture lenses for large refracting telescopes.

ASTRONOMY

1852

Johann von Lamont of Germany reported on 15 years of observations of the earth's magnetic field, providing the information that it fluctuated on a 10.3-year cycle. He did not notice that this fluctuation of the earth's magnetic field coincided with the sunspot cycle of the sun, but that information was provided in this year, independently, by Sir Edward Sabine in the British Isles, Rudolf Wolf in Switzerland, and Alfred Gautier in France. The study of relationships between solar phenomena and terrestrial phenomena had fairly begun.

ASTRONOMY

At some point during the early 1850s (I will for convenience insert the data element here), Alvan Graham Clark joined the family firm of Alvan Clark & Sons in Cambridge, Massachusetts in the development and manufacture of lenses for large refracting telescopes.

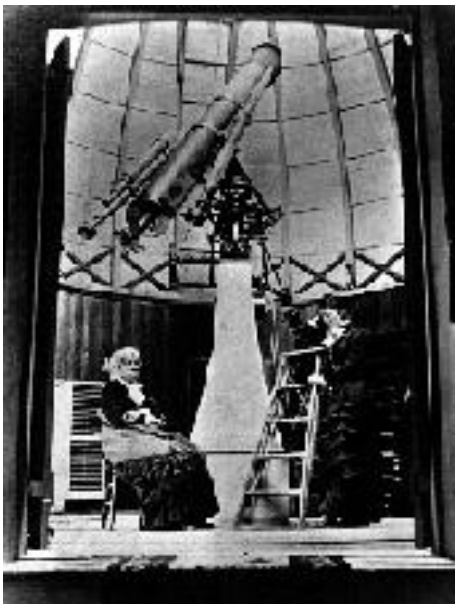
1858

During the late 1850s, Alvan Clark attracted attention to his company's lenses for large refracting telescopes by discovering two double stars.

ASTRONOMY

1859

A 5-inch Alvan Clark refractor telescope was purchased with funds contributed by the women of America, and presented to Maria Mitchell.



ASTRONOMY

ALVAN CLARK

ALVAN CLARK

"The needle is the chain of woman, and has fettered her more than the laws of the country."
— Professor Maria Mitchell

1862

Alvan Graham Clark used his newly constructed refractor, the largest in the world, to view for the first time Sirius, the white-dwarf companion to the Dog Star.

ASTRONOMY

1865

November 14, Tuesday: Henry Thoreau had commented on an observatory, that he had slept outside of while hiking in the summer of 1844, in A WEEK ON THE CONCORD AND MERRIMACK RIVERS:

> A WEEK: This observatory was a building of considerable size, erected by the students of Williamstown College, whose buildings might be seen by daylight gleaming far down in the valley. It would be no small advantage if every college were thus located at the base of a mountain, as good at least as one well-endowed professorship. It were as well to be educated in the shadow of a mountain as in more classical shades. Some will remember, no doubt, not only that they went to the college, but that they went to the mountain. Every visit to its summit would, as it were, generalize the particular information gained below, and subject it to more catholic tests.

ALVAN CLARK

ALVAN CLARK

Waldo Emerson, upon looking through the Alvan Clark telescope at this Williams College Observatory, made the following entry in his journal:

I saw tonight in the observatory, through Alvan Clark's telescope, the Dumb-Bell nebula in the Fox and Geese Constellation; the four double stars in Lyra; the double stars of Castor; the two hundred stars of the Pleiades.... I have rarely been so much gratified.
Of all tools, an observatory is the most sublime. And these mountains give an inestimable worth to Williamstown and Massachusetts. But, for the mountains, I don't quite like the proximity of a college and its noisy students. To enjoy the hills as a poet, I prefer the simple farmers....
What is so good in a college as an observatory? The sublime attaches to the door and to the first stair you ascend; – that this is the road to the stars. Every fixture and instrument in the building, every nail and pin, has a direct reference to the Milky Way, the fixed stars, and the nebulae, and we leave Massachusetts and history outside at the door when we come in.

1873

There was a new edition of Hiram Mattison's edition of Elijah Hinsdale Burritt's A PLAN OF THE SOLAR SYSTEM EXHIBITING ITS RELATIVE MAGNITUDES AND DISTANCES (New York: Mason Brothers).

ASTRONOMY

The firm of Alvan Clark & Sons of Cambridge MA provided a 24-inch lens for the US Naval Observatory in Washington DC (this telescope is still operational).

GEORGE BASSETT CLARK
ALVAN GRAHAM CLARK

1878

The firm of Alvan Clark & Sons of Cambridge, Massachusetts provided a 30-inch lens for the Pulkovo Observatory near St. Petersburg in Russia. (The facility would be destroyed during WWII.)

GEORGE BASSETT CLARK
ALVAN GRAHAM CLARK

1882

December 6: David Peck Todd (1855-1939) had made his way to Southern California to photograph the transit of Venus from the summit of Mount Hamilton, where a solar photographic telescope made by the Boston optical firm Alvan Clark & Sons waited among the stacks of bricks and timbers from which Lick Observatory was rising. As the transit unfolded on this day, the Amherst College astronomer obtained a superb series of plates under perfect skies. His 147 glass negatives would be carefully stored in the mountain vault, but astronomers would turn to other techniques for determining the scale of the solar system and these plates would remain untouched and eventually be forgotten.

ASTRONOMY

The project had been to measure accurately the distance between the earth and the sun, by means of a measurement of the transit of Venus. The idea was that, since we cannot measure this distance with a yardstick, we might substitute a clock. The proposal was to measure the distance with a clock, by noting the exact time at which the disk of Venus touched the edge of the disk of the sun, when observed by qualified observers positioned at various known locations on the surface of the earth. From the differences between these time measurements, we were to triangulate the exact distance to the sun. Previous observations had been unsatisfactory, but in this year the observations were good, and when the results came in, it was obvious that the entire project had been wrongheaded from the get-go. Venus's shape distorted so much as it passed over the limb or edge of the sun, that there was just no way to make an objective and accurate time measurement.

Thus, when the transit of Venus occurred again on June 8, 2004, astronomers simply didn't care.

The next transits will occur on June 6, 2012, while some of us will still be alive, and December 11, 2117, by which time assuredly all of us will be long since dead and buried.

1883

The firm of Alvan Clark & Sons of Cambridge, Massachusetts provided a 28-inch lens[4] for the University of Virginia at Charlottesville, Virginia (this telescope is still operational).

GEORGE BASSETT CLARK
ALVAN GRAHAM CLARK

4. Now you can appreciate why it is has been, in keeping track of the development of the science of astronomy, all along we have been keeping track as well of the development of techniques for the manufacture of glass.

1887

August 19: Four German warships arrived off Apia, Samoa and landed about a hundred soldiers. The government officials of King Malietoa fled as best they might.

Alvan Clark died in Cambridge, Massachusetts.

Spencer Fullerton Baird died at Wood's Hole, Massachusetts.

SPENCER F. BAIRD DEAD.

HIS LIFE WORK BROUGHT TO A CLOSE AT WOOD'S HOLL.

WASHINGTON, Aug. 19.—Prof. Spencer F. Baird, head of the Smithsonian Institution and the United States Fish Commission, died at 3:45 o'clock this afternoon at Wood's Holl, Mass., where he had been sick for some time. His body will be brought here for burial.

Spencer Fullerton Baird was of mixed Scotch, English, and German descent. His ancestors were preachers, surveyors, bankers, and lawyers of New-Jersey and Pennsylvania. One of them was so effective a war preacher during the Revolution that a price was set upon his head by the British Government, and it was after this robust patriot, the Rev. Elihu Spencer, that Prof. Baird took his distinguishing name. The father of the dead scientist was a lawyer of Reading, Penn. He is described as a man of high culture and close observation, and an ardent lover of outdoor pursuits. His sons inherited his tastes.

At the age of 14 Spencer Baird, with his elder brother William, commenced a collection of game birds found in Cumberland County, Penn., which afterward was made the nucleus of the present magnificent Smithsonian Museum. The brothers contributed papers to the Philadelphia Academy of Sciences, which received marked attention, and soon afterward the great ornithologist, Audubon, became interested in Spencer Baird, and established a friendship with him which continued until Audubon's death and did much to shape the future career of his gifted protégé. Audubon presented him with a large part of his collection of birds, and young Baird in return contributed many facts and specimens to aid in the production of Audubon's works.

Prof. Baird graduated from Dickinson College at the age of 17, and subsequently studied medicine in New-York, although he never followed that profession. In 1845, when he was 22 years old, he was elected Professor of Natural History of the college at which he had graduated. Two years later he became associated with the distinguished Agassiz, and projected with him a work on the fresh water fishes of the United States, which was never completed. During all this period it was his habit to make extended pedestrian tours for the purpose of extending his knowledge and enlarging his natural history collections. So great were his powers of physical endurance that he had been known to cover nearly 60 miles on foot in one day between sunrise and rest.

In 1850 Prof. Baird was elected Assistant Secretary of the Smithsonian Institution, with which his name and fame have since been indissolubly connected. On the death of Prof. Henry he became the head of the institution. In 1871 he was appointed by President Grant United States Commissioner of Fisheries, an office which added largely to his responsibilities and nothing to his compensation. The services he rendered in this capacity in increasing the food supply of the world would alone justify a national monument to his memory.

But Prof. Baird's history is the history of the systematic zoology of the United States. A chronological catalogue of his works, prepared by order of the Smithsonian Institution and only carried down to 1882, includes over 1,000 titles. His services to science and natural history were rewarded by medals from the Acclimatization Societies of Australia, France, and Germany. He was a member of the leading scientific associations of England, Austria, France, Germany, Holland, Portugal, and New-Zealand. Over 33 distinct genera and species in North, South, and Central America and the West Indies have been named in his honor.

The extent of Prof. Baird's labors and the practical service he has rendered as head of the Smithsonian Institution cannot be overstated. It is a melancholy fact that his last hours were embittered, and, according to the testimony of Prof. Goode, his assistant, and other associates, his life was perceptibly shortened by causeless imputation, instigated by a New-York newspaper, cast upon his administration of the large fund placed at his disposal as head of the Fishery Commission. There never was the slightest foundation for those charges. They were investigated by Mr. Randall's appropriation committee and found to be absolutely baseless, and the appropriation was continued without change. But the unjust suspicion struck home to Prof. Baird's sensitive mind, and, with a brain and constitution enfeebled by incessant and long-continued overwork, hastened his death.

The New York Times

1888

Alvan Graham Clark provided a 36-inch lens for the Lick Observatory atop Mount Hamilton in Southern California (this telescope is still operational).

1889

AUTOBIOGRAPHY OF ALVAN CLARK (with William Wallace Payne).

1891

December 20: George Bassett Clark died in Cambridge, Massachusetts.

1896

Alvan Graham Clark provided a 24-inch lens for the Lowell Observatory in Flagstaff, Arizona (this telescope is still operational).

1897

June 9: Alvan Graham Clark provided a 40-inch lens for the Yerkes Observatory at Williams Bay in Wisconsin (this telescope is still operational and the lens is still the largest refractor lens in the world), and in this year he died in Cambridge, Massachusetts (during his lifetime he had discovered a total of 16 double stars).

1995

Deborah Jean Warner's and Robert B. Ariail's ALVAN CLARK & SONS: ARTISTS IN OPTICS.

Those interested in the history of astronomy as well as those who appreciate a finely made telescope are likely aware of the contributions of the New England Yankee Clark family. Alvan Clark and his two sons, Alvan Graham and George Bassett created about 400 instruments between 1859 and 1958. They were arguably the finest telescopic instruments of their day. These telescopes found their ways into many private homes as well as the most illustrious observatories. Warner and Ariail have collaborated together to trace not only the history of the Clark enterprise, but also catalog the known Clark instruments and their whereabouts, making this an invaluable reference work for anyone interested in antique and historic scientific equipment.
Alvan Clark was a New England Yankee in every sense of the word. Both of his grandfathers where whalers on Cape Cod and he was a Mayflower descendant on his father's side. He showed little

interested in school, but he had unusually keen visual perception that manifested itself early on. He became an artist and supported himself by painting portraits in ink and watercolor soon after he left home. Later he studied engraving. But he felt he could not compete with the precision of photography, and by 1860 he closed the portrait portion of the business for good.

Clark became interested in astronomy through his future wife, Maria Pease, who was boarding with the family of Edward Hitchcock, a pastor of the Congregational Church. Hitchcock was also an avid amateur astronomer. Maria and Alvan were married in 1826 and had four children: George Basset (1827), Maria Louisa (1829), Alvan Graham (1832) and Caroline Amelia (1835). But he did not become a telescope maker until 1844 when general interest in astronomy heightened due to the comet of 1843. Clark's son George was attending Phillips Academy at Andover, in preparation for attending Harvard. The dinner bell broke and George decided to melt down this bell metal to make a reflecting telescope. Alvan observed his son's work with growing excitement until he could be a passive observer no more. Within a few years, Alvan Clark had made several metal reflecting telescopes with apertures up to 8 inches. In 1846 he began to make lenses and within one year had gained enough expertise to locate slight errors in the 15-inch at Harvard. By 1848 he sold his first telescope, a 5-inch achromatic refractor, to Putnam Free School in Massachusetts.

The boys joined Clark in the business. George was the mechanic and designer, while Alvan and Alvan Graham were the opticians. Reproduced engravings taken from Scientific American 1887 illustrate their workrooms. In these Spartan rooms, they made objectives for some of the largest refractor telescopes in the world, including the 40-inch lens at the Yerkes Observatory.

Eventually they expanded their business and took on additional assistants. One was Carl Axel Robert Lundin, a Swede who was hired at the age of 23 and remained with the company until his death 41 years later. Alvan himself was active in the testing and final work until just a few years before his death at the age of 83 in August 1887. Both of his sons soon followed him, George in December 1891 and Alvan Graham in June 1897. Because George died childless and Alvan Graham did not have what was considered then to be a suitable heir to carry on the business (his only son died at age 14 and his three daughters did not marry instrument makers), the business was incorporated in 1901 as "Alvan Clark & Sons." Lundin remained in charge of the optics and was later succeeded by his son. W.W. Dinwiddie supervised the mechanical department. The elder Lundin died in 1915 and Robert Lundin left the firm around 1928. The company went into decline during the Depression. Eventually it was sold to Sprague-Hathaway Manufacturing. The grinding tools and other metal items were sold for scrap iron during World War II and the rest of the company liquidated and sold at junk values in 1958. Despite this unhappy end of the company itself, the Alvan Clark & Sons legacy lives on in the telescopes they made. Part II of the book lists every known Clark instrument and its provenance, beginning with Mary Gertrude Mead Abbey, a "learned, cultured and ambitious woman" who bought a 5-inch refractor in 1871. Maria Mitchell (America's first woman astronomer) placed the order and the telescope is now at the Nantucket observatory that

bears her name. To read through the catalogue descriptions is to read fascinating bits of historical astronomical trivia complete with many black and white photographs. Part III lists the instruments by size and date of manufacture.
Parts IV (an essay concerning the Clark customers) and V (technical points concerning the smaller telescopes) offer further detail of interest to a Clark aficionado. For example, there are detailed descriptions of the signature changes of various instruments over the years. Finally, Part VI catalogues the known Clark portraits with several illustrations of his work. They reveal someone with a fine gift for detail, regardless of the medium in which he worked.

"It's all now you see. Yesterday won't be over until tomorrow and tomorrow began ten thousand years ago."

– Remark by character "Garin Stevens"
in William Faulkner's INTRUDER IN THE DUST

Prepared: June 15, 2013

ARRGH AUTOMATED RESEARCH REPORT

GENERATION HOTLINE

This stuff presumably looks to you as if it were generated by a human. Such is not the case. Instead, upon someone's request we have pulled it out of the hat of a pirate that has grown out of the shoulder of our pet parrot "Laura" (depicted above). What these chronological lists are: they are research reports compiled by ARRGH algorithms out of a database of data modules which we term the Kouroo Contexture. This is data mining. To respond to such a request for information, we merely push a button.

Commonly, the first output of the program has obvious deficiencies and so we need to go back into the data modules stored in the contexture and do a minor amount of tweaking, and then we need to punch that button again and do a recompile of the chronology — but there is nothing here that remotely resembles the ordinary "writerly" process which you know and love. As the contents of this originating contexture improve, and as the programming improves, and as funding becomes available (to date no funding whatever has been needed in the creation of this facility, the entire operation being run out of pocket change) we expect a diminished need to do such tweaking and recompiling, and we fully expect to achieve a simulation of a generous and untiring robotic research librarian. Onward and upward in this brave new world.

First come first serve. There is no charge.
Place your requests with <Kouroo@kouroo.info>.
Arrgh.