

DISCOVERING JOHN BRASHEAR AND HIS FORGOTTEN TIME CAPSULE

By Liz Simpson and Anne Madarasz



The simple, brass box has a shallow lid and was soldered shut.

HHC Collections, L2015.50. Photo by Liz Simpson.

On March 24, 2015, as workers from the Jadell Minnifield Construction Company demolished the last wall of the John A. Brashear Astronomical & Physical Instrument Works building on the North Side, a small, brass box appeared in the wreckage. Placed in the cornerstone of that building more than 120 years ago, the box contained almost 60 documents, photos, and objects. Those material contents were carefully assembled by John Brashear, likely in 1894 after the building was completed. Brashear was a largely self-taught astronomer and instrument maker who rose to the peak of those professions in Pittsburgh through his hard work and desire for perfection. The material contents of the time capsule are much more than a simple record of the man, his building, or the times. They provide an intimate look at Brashear's career and life,

documenting the people who helped him achieve his dream of building scientific instruments to explore the stars.

John Alfred Brashear was born to Basil Brown and Julia Smith Brashear in Brownsville, Pa., on November 24, 1840. His maternal grandfather, Nathaniel Smith, was a mechanic, tinkerer, and musician who helped to foster John's interests in those subjects. He also taught John to recognize the constellations and provided his first exposure to learning about the wonders of the night sky by taking him, at age 9, to meet a fellow amateur astronomer visiting their hometown of Brownsville. Brashear recalled his first glimpse through the small homemade telescope that "Squire" Joseph P. Wampler brought for the townspeople to look through: "young as I was, the scenery on the moon



The complete contents of the Brashear time capsule were carefully unpacked and documented in the Grace M. Compton Conservation Lab upon their arrival at the History Center.

HHC Collections, L2015.50. Photo by Liz Simpson.

and the rings of Saturn impressed me deeply.”¹

Brashear pursued some basic schooling, then as a teenager went to work as an apprentice in the pattern shop of steamboat builder John Snowden & Sons, where mechanical work and manual labor came more naturally to him. After his apprenticeship, work took him to Louisville, Ky., building engines for the city waterworks before the onset of the Civil War.² At age 21 he made his way back to Pittsburgh via Brownsville and settled into the city with various jobs, first as a millwright at the rolling mill of Zug & Painter in today’s South Side and later briefly in the mold shop of Adams & Co., a glass factory.

While working at Zug & Painter, Brashear boarded at the home of Thomas Stewart and his daughter Phoebe. Brashear was also the choir director at the local Methodist church



John A. Brashear Astronomical & Physical Instrument Works located at 2016 Perrysville Ave. in Observatory Hill. Brashear and his workmen placed the time capsule in the cornerstone of this building on August 14, 1894 and it was not discovered until the building’s demolition on March 24, 2015.

University of Pittsburgh Archives, Allegheny Observatory Records, 1850-1967, 6422.15.01.A0.

Learn More Online



John Brashear’s fascinating autobiography



Conservator Csilla Crisanti was called in to the History Center to carefully open three envelopes in the time capsule that were sealed with adhesive. Here she applies steam to a narrow strip on the back of an envelope before gradually prying it open.

Photo by Liz Simpson

where Phoebe taught, so the two came into contact frequently. Brashear recalls that, “Perhaps that was one of the most important episodes of my whole life; for an affection between us soon ripened into love, a love which abideth.”⁷³ John and Phoebe married in a modest ceremony on September 24, 1862, and after putting away some savings, they made plans to build their own home on the South Side slopes to remain close to the mills. Together they would climb the hill to their plot of land on Holt Street where Phoebe “would help him put the boards in place, and either hold a lantern while he drove the nails or else hand the lantern up and drive nails herself.”⁷⁴ The two also shared a deep love of the stars and, as soon as their home in the South Side was completed, they set out to fashion their own telescope in 1872. At night, in a small workshop behind their home after working

long hours in the mill, Brashear pursued his true passion: fashioning a quality lens and building his own telescope.

Brashear came of age as a scientist and inventor as the discipline of science emerged in America. Many noted inventors of his time, such as George Westinghouse and Thomas Edison, did not have extended formal schooling. They were tinkerers or mechanics whose observation and exploration of the physical world, matched with a creative and questioning mind, led them to new ideas. Structured programs to teach and share scientific learning at the university level were just beginning to form; the Massachusetts Institute of Technology, founded in 1861, began to offer classes in 1865.⁷⁵ MIT’s emphasis on industrial science and its use of hands-on experimentation encouraged work in applied science and mirrored the processes of amateur

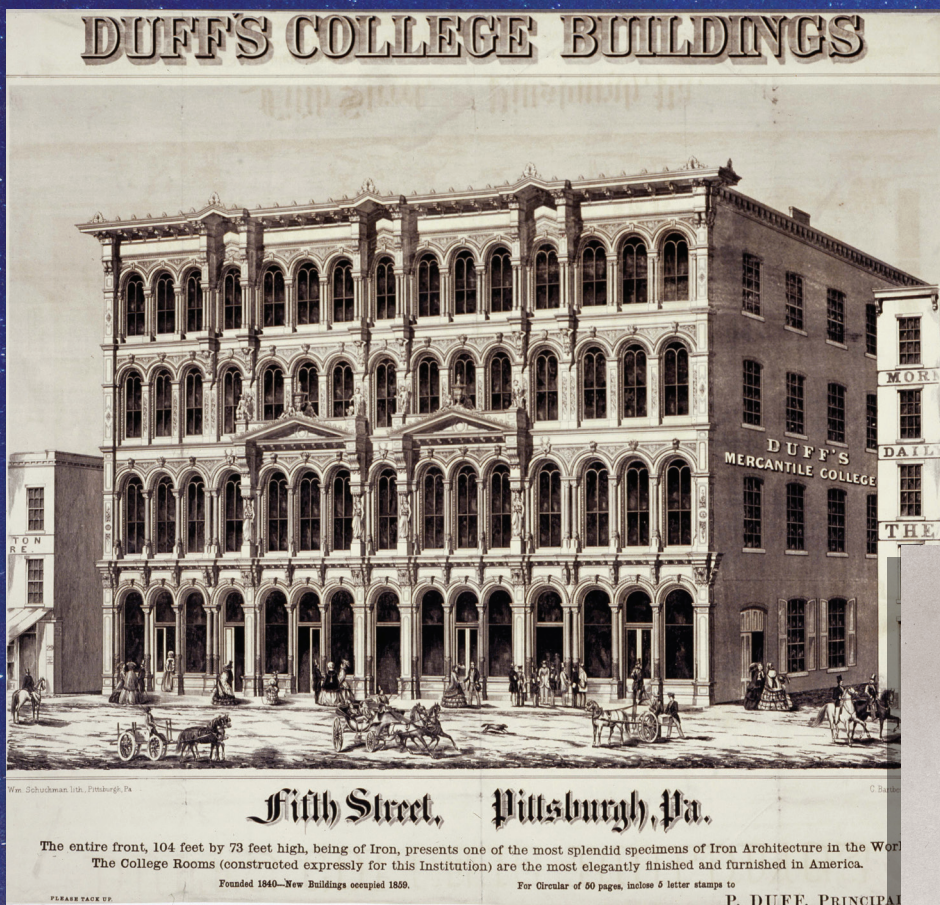
scientists such as Brashear, who, through trial and error in his workshop laboratory, came to a new understanding of how to study the stars

Brashear relied on his relationships with other men of inquiry to further his studies. The letters to and from his contemporaries inside the time capsule document the importance of these connections to his life and career. After several setbacks, John and Phoebe completed their first five-inch refractor lens and were ready to have it examined by an expert. In a letter dated October 11, 1874, Brashear mustered the courage to write to Samuel Pierpont Langley, the first director of the Allegheny Observatory and a professor of astronomy at the Western University of Pennsylvania (now the University of Pittsburgh), to ask him to evaluate the quality of the lens and for his advice on improving it. As an amateur it must have been incredibly intimidating for Brashear to approach an established man of science like Langley. Brashear described when they met: “with fear and trembling, I unwrapped from a red bandana handkerchief my first five-inch objective which my wife and I had made. His encouragement then and afterwards made my subsequent work easier by far.”⁷⁶ From that meeting Brashear was introduced to the larger scientific world and several wealthy patrons of the sciences.

Chief among the reasons for Brashear’s continued experimentations in making lenses and telescope apparatuses was his relationship with and monetary support from William Thaw, Sr. As a vice president for the Pennsylvania Railroad, Thaw became a wealthy patron of the sciences, donating generously to the Allegheny Observatory but also to many other causes throughout the country. Thaw first took notice of Brashear’s astronomical expertise after reading of his findings and observations in local newspapers. The two were introduced to each other in person by Langley at the Allegheny Observatory and their dedication to advancing the knowledge of the stars bonded



“They were tinkerers or mechanics whose observation and exploration of the physical world, matched with a creative and questioning mind, led them to new ideas.”



Brashear came to Pittsburgh around 1855 at age 15 to attend Duff's Mercantile College, the first business school in the country. He returned home to Brownsville, Pa., after only a few months, as he was more suited for vocational training rather than studying bookkeeping.

HHC Detrie L&A



In 1867 Samuel Langley arrived in Pittsburgh to assume his post as the first director of the Allegheny Observatory. As evidenced in a letter in the time capsule, it wasn't until 1874 that Brashear built up the courage to contact Langley and ask to meet for advice on his first lens. This meeting where Langley shared his books and enthusiasm with Brashear, helped professionalize his work and introduced him to the larger world of science.

Library of Congress, LC-H261-9495-A

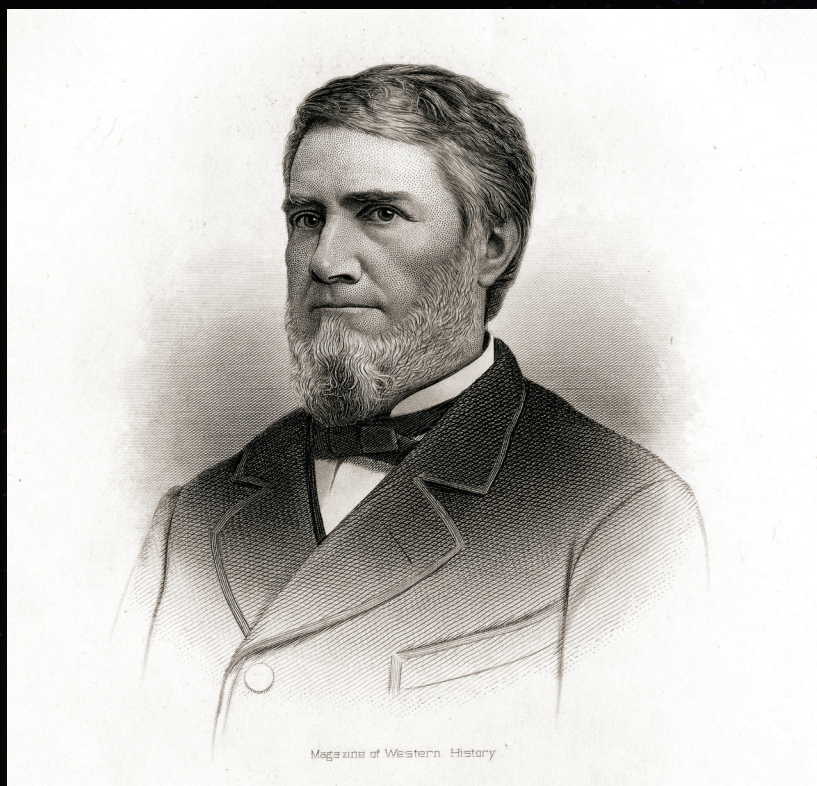
them. Thaw recognized Brashear's dedication to his craft and funded the enlargement of the shop behind his home that allowed him to produce more optical parts and do more complicated work for other astronomers. By 1881, the new shop was complete and Brashear was able to quit working at the mill to focus on making telescope equipment full time.

Helping Brashear too was his son-in-law, James McDowell, who had worked in the Bryce glass factory. With McDowell's skill and eye for perfection, their superior lenses, prisms, and mirrored surfaces were sought by the most advanced scientists in the U.S. and Europe. By 1885, the volume of work was too much for Brashear and his five assistants to handle and Thaw suggested that they move their business

to a new, larger building.⁷ In the spring of 1886, Thaw allowed him to build on a plot of land he owned on Perrysville Avenue near Allegheny Observatory where the air was also much clearer to observe the night sky. Brashear and his men designed the new building and its machinery to produce and test a variety of very precise lenses and instruments — Brashear “had never dreamed of having anything so nice.”⁸ Without ceremony on August 14, 1894, Brashear and his employees placed the time capsule box in the cornerstone of that building with the hope that it would be discovered some time in the future.

The letters, photographs, and ephemera in the time capsule give rare insight into the people that John Brashear held dearest in his life and work while also demonstrating the

breadth of his impact on Pittsburgh and the scientific world. To Brashear, the memories of “his friends in this profession are to-day treasures of greater worth than gold or precious stones.”⁹ We are fortunate that Brashear decided to place so many pieces of his life into this box so that one day others might learn from and be inspired by his accomplishments. As Brashear writes in a letter that was found at the top of the time capsule, “I hope when I’m gone that these pieces will never be forgotten by those in whose hands I leave it.” With this time capsule, his legacy and desire to share his knowledge of the beautiful world in which we live is now firmly preserved at the History Center. 



William Thaw, Sr., philanthropist and one of the Pennsylvania Railroad's vice presidents, became the patron of Brashear's astronomical pursuits after being introduced to him by Langley. Without his aid, it would have been impossible for Brashear to continue his meticulous and costly work.

HHC Detre L&A.

See also “At Long Last, a Recreation Park Photo Comes to Light” in the Spring 2016 issue of *Western Pennsylvania History*.

Liz Simpson is the Assistant Editor/Assistant Registrar at the History Center who has worked to record and photo document the contents of the Brashear time capsule.

Anne Madarasz is the Vice President of Museum Exhibits and Collections/Co-Director of the Western Pennsylvania Sports Museum at the History Center.

¹ John A. Brashear and William Lucien Scaife, ed., *John A. Brashear: The Autobiography of a Man Who Loved the Stars* (Pittsburgh: University of Pittsburgh, 2001), 8.

² *Ibid.*, 15.

³ *Ibid.*, 19.

⁴ “‘Uncle John’ Brashear,” *The Monthly Evening Sky Map* 6, no. 61 (New York: Sky Map, 1912).

⁵ MIT Libraries Archives, “Top Ten MIT History Facts,” <https://libraries.mit.edu/mithistory/mit-facts/>.

⁶ John A. Brashear, 131.

⁷ *Ibid.*, 92.

⁸ *Ibid.*, 96.

⁹ *Ibid.*, 38.

NOW

YOU CAN EXPERIENCE THE EXCITEMENT OF

**OPENING JOHN BRASHEAR'S
TIME CAPSULE FOR YOURSELF.**

« Simply open the gatefold to explore a selection of
the most meaningful items that were found inside.



John A. Brashear,
Astronomical & Physical Instrument Works,
Allegheny, Pa. U.S.A.
CABLE ADDRESS: BRASHEAR, ALLEGHENY, PA. ASSOCIATES: JAMES McDOWELL, ONEIDA, NEW YORK

Aug 14

The corner stone of this building was laid Aug 14th. Without ceremony and the boys of the shop and the workmen and myself being the witnesses, my good wife being away in a few days next the first of Nov. Then at P.O. I have a wish to express and that is that in this building devoted to the advance of scientific research that every piece of work shall be made as perfect as human hands and human brains can make it. No force ever to be made for imperfect work. I hope when I am gone these precepts will never be forgotten by those in whose hands I leave it. J.A. Brashear

All photos HHC Collections, L2015.50.

Letter written by John Brashear on August 14, 1894, the day that the time capsule was placed into the cornerstone of his new astronomical workshop building on Perrysville Avenue. It was deposited "without ceremony and the 'boys' of the shop and the workmen and myself being the witnesses." Brashear states his wish "that every piece of work shall be made as perfect as human hands and human brains can make it, no excuse ever to be made for imperfect work. I hope that when I am gone that these precepts will never be forgotten by those in whose hands I leave it." It was Brashear's desire for perfection that made his products so valuable to scientists.



Cabinet card of John Brashear. On the back, Brashear writes, "The 'Governor' or 'Pa' as the boys of the shop call him. At the building or rather laying of this corner stone he is 53 years 9 months and 20 days old. August 14, 1894."

Brashear was a beloved figure in the community and invited neighbors to visit him and look through the telescope he had in his home on Holt Street in the South Side. In his autobiography he writes, "I think that all my life I have been partial to old people and children, and it has always been a source of genuine pleasure to contribute to their happiness.... It is sharing the good I have received with the 'other fellow' that makes life worth living."¹

Cabinet card of Effie Afton McDowell, adopted daughter of John and Phoebe Brashear and wife of James McDowell.



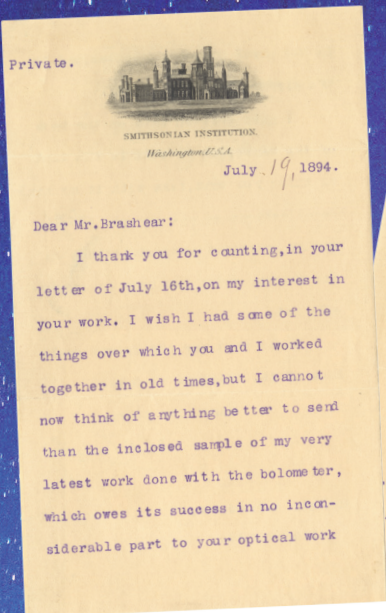
Cabinet card of Brashear's wife, Phoebe. Brashear writes on the front of the image, "My Dear 'Girl' - 'Ma' as we all call her. To her we give all credit for our success—she deserves it. J.A. Brashear."

Recalling their work to create their first five-inch lens in their little workshop behind their house on Holt Street in the South Side, Brashear writes:

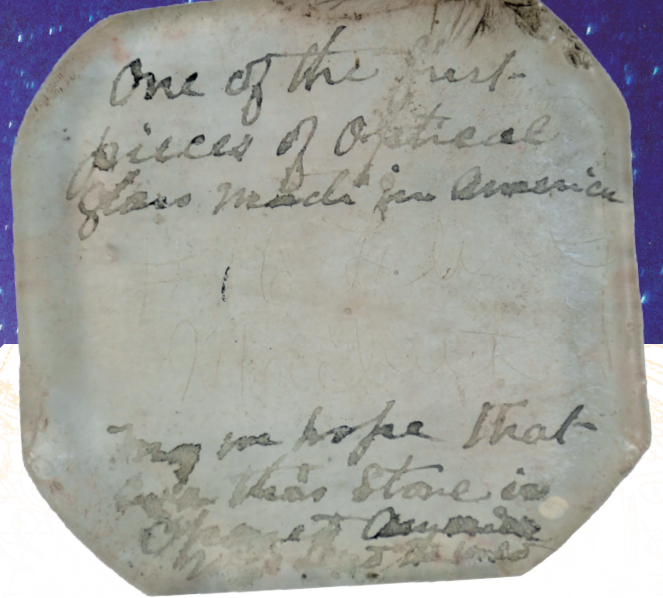
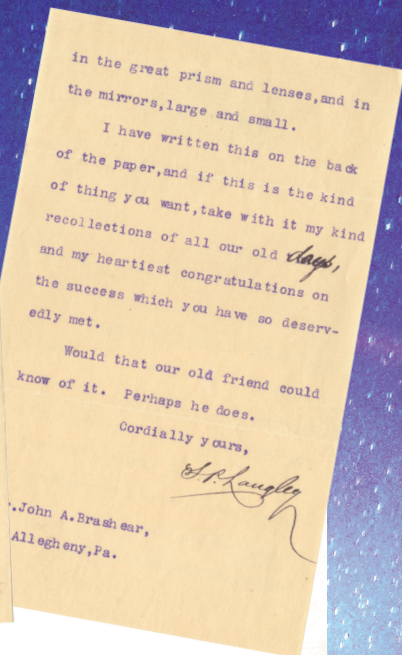
Night after night I came home from the rolling mill to find steam up and everything in readiness for work in the little shop. Ma kept the engine oiled, the tools and bottles in order, and the room neat and clean. After supper was over and the dishes washed, she would come back to help me in my mechanical work and later in my observations. Her material assistance was valuable, but the inspiration I had from her which helped me over the rough places of life to the next step is completely beyond my poor words of appreciation. She was a helpmate in the fullest sense of the word.²

Also included in the time capsule is a lock of Phoebe's hair and on the envelope Brashear writes, "It was she who stood by me through the darkest hours and whose good cheer & helping hands and loving sympathy were prime factors in my success."





Letter from Samuel P. Langley on Smithsonian Institution letterhead, dated July 19, 1894. Brashear received this letter to be placed in the time capsule almost 20 years after first writing to Langley for advice. Langley became the third Secretary of the Smithsonian in 1887, splitting his time between Washington, D.C., and the observatory in Pittsburgh. For three years, Brashear assisted Langley's investigations into the laws governing flight by making the mechanical apparatuses that he used in his testing.⁵



This small, rough piece of glass has “#16 Flint Macbeth” etched on the front. The inscription in ink is difficult to decipher but it appears to read, “One of the first pieces of optical glass made in America. May we hope that when this stone is opened America will lead the world.”

Obtaining quality optical glass became one of the main challenges Brashear faced in making lenses. Much of what he used had to be ordered from Europe, so the glass took months to arrive and was often damaged in transit. This piece is likely from a factory opened by George Macbeth, a Brashear friend, in 1891. A Pittsburgh glass manufacturer who specialized in lamp chimneys, Macbeth bought a 13-acre piece of land in Elwood, Indiana, and built a two-furnace factory. He relocated about 150 glass workers from Pittsburgh to man the operation and they began producing lead glass chimneys. In one part of the facility called “The French House,” probably in deference to French master glassman Edmond Feil, Macbeth began experimenting with the production of glass for lenses. With experimentation, some quality optical glass resulted. It is known that Brashear used Macbeth glass for the lens of a telescope made for the Tokyo Observatory and other later projects. Production halted after Feil left and Macbeth failed to find an accomplished glassman to replace him.



Photograph of the “Boys of the Shop,” 1893, found inside the back of the book, *In Memoriam William Thaw*.

C. James McDowell married the Brashear's adopted daughter, Effie, in March 1880. McDowell worked for Bryce Glass Company and later brought his knowledge of glass making and polishing to Brashear's company. Upon the opening of the new Allegheny Observatory with equipment made by his company, Brashear praised McDowell's work, writing that he “left no stone unturned that we might have the very best.”³

M'. “Jackie” John A. McDowell was married at 22 and listed as an optician at Brashear's company. Later, on company letterhead, he is referred to as the treasurer. Jackie died in 1920 at age 39 from influenza.

M. “Walt” James W. McDowell was listed with the Brashear company personnel and worked on lenses. He died of pneumonia in 1916 at the age of 32.

Walt and Jackie were Effie and James' children and the grandchildren of the Brashears.

J. Charles Harry Brashear was the adopted son of John and Phoebe. He was an associate in Brashear's company and later died of typhoid fever after contracting it on vacation in 1896.



Cyanotype of the Western University of Pennsylvania (now University of Pittsburgh), 1893, taken by John Brashear, who asks on the back, “What will it be in — when this stone is opened. May it be a second Harvard or Yale.”



Cyanotype of the Allegheny Observatory spectroscope. Brashear writes on the back, "One of our best Spectroscopes. Made for 'Allegheny' U.S. Naval and Yerkes Telescopes."

The new field of astrophysics created many customers for the Brashear factory. Instruments could be ordered from a standard catalog or custom made to meet the customer's specific needs. The Allegheny spectroscope was used by James Keeler to discover that the rings of Saturn were made of particles.

To My Friend
Professor Brashear
with every good wish
Andrew Carnegie

Clipping from one of the many books that Brashear borrowed from Andrew Carnegie. Brashear could not reach Carnegie in time to ask for a contribution for the time capsule since he was in England and decided to include this small piece that he already possessed. Carnegie was among Brashear's personal friends and one of the sponsors of the new Allegheny Observatory, donating \$20,000 to the project. From 1898 until 1912 when the new observatory opened, Brashear worked almost single-handedly to raise the \$300,000 needed for the new building and equipment.

Albumen print of the employees of Brashear's Mechanical Department, August 1894.

Written on the back are the names of the men, all makers of telescope mounts, tubes, dials, and focusers. The text reads, "With the best wishes for success and a long and useful life to our employer, and The hope that this building shall stand for many generations, serving the purpose for which it is being erected, The Advancement of science, We deposit our names into this cornerstone."

Etched into the underside of the lid of the metal time capsule box is the name E. Miller, likely Edward Miller, who is seated at the top of the steps on the left. It is probable that he is the person who fabricated the box.

Employees Mechanical Department
August 1894
Jas. Keeler foreman
Jas. Keeler
Wm. B. Hartman
Charles Miller
Robt. Keeler
George Henderson
Ed. Miller
With the best wishes for success
and a long and useful life to our
employer, and
The hope that this building shall
stand for many generations, serving
the purpose for which it is being
erected, The Advancement of science,
We deposit our names into
this cornerstone.



WARNER & SWASEY
CLEVELAND, OHIO, U.S.A.
July 21, 1894.
John A. Brashear,
Allegheny, Pa.
Dear Sir,-
Learning that the corner stone for your new building for
the construction of scientific instruments is about to be laid, per-
mit us the honor of depositing in the sealed box just a word of con-
gratulation and congratulation for the great success which you have at-
tained in optical work and the construction of astronomical in-
struments. The erection of your factory seems to us symbolical of your
own progressive career, for as each brick is laid in place and the
building rises higher and higher, so has it been with your reputa-
tion and the quality of your work. We trust that you may be spared
these many, many years to carry out your earnest labors in your new
factory, and bring still greater honors upon your name, and benefits
upon the scientific world.
It will be interesting to the people who may open this box
a hundred years hence to know that you have carried the work of the

Letter to Brashear from W.R. Warner and Ambrose Swasey to be placed in the time capsule. Warner & Swasey made mechanical parts for telescopes that were ordered by Brashear. In their letter they write:

It will be interesting to the people who may open this box a hundred years hence to know that you have carried the work of the optician to that stage of perfection which enables the largest Telescope Objective to excel the small ones in space penetrating power by the full

amount of their proportionally increased area, and we hope that those people a century hence will carry the work, so far advanced by you, to a still higher degree of perfection, if that is possible, and to build Telescopes even larger than those of the present date. Whatever they may do, they will look back with grateful pride to what you have accomplished, for you have given them all the secrets which you have wrought out from nature's laws, so we can truthfully congratulate both you and your successors in the coming centuries on the work you have done, and on the splendid building you are erecting for carrying this work to a still higher degree of perfection.

The largest Tele-
constructing power
nature's laws, and we
to a still higher degree of perfection, if that is
date. Whatever they may do, they will look back with grateful
secrets which you have wrought out from nature's laws, so we can
truthfully congratulate both you and your successors in the coming
centuries on the work you have done, and on the splendid building
you are erecting for carrying this work to a still greater degree of
perfection.
Most sincerely yours,
W.R. Warner,
Ambrose Swasey

Book from William Thaw, Sr.'s memorial, 1891. Samuel Pierpont Langley, director of the Allegheny Observatory, introduced Brashear to William Thaw, Sr., who was a patron of the observatory. Believing in Brashear and seeing the passion behind his optical work, Thaw funded many of his endeavors and paid for his new factory on Perrysville Avenue in which the time capsule was placed.

Inside the front cover of the book is a note from Brashear ruminating on his friend and the building the day before the time capsule was deposited: "May this structure be dedicated to the noble work of making only the best instruments for aiding in pushing outward the bounds of human knowledge.... Perhaps when this is read again it may be [a]

greater Pittsburgh." Reprinted in the book is a letter that Brashear wrote about Thaw after his death that also appeared in the *Chronical Telegraph*.

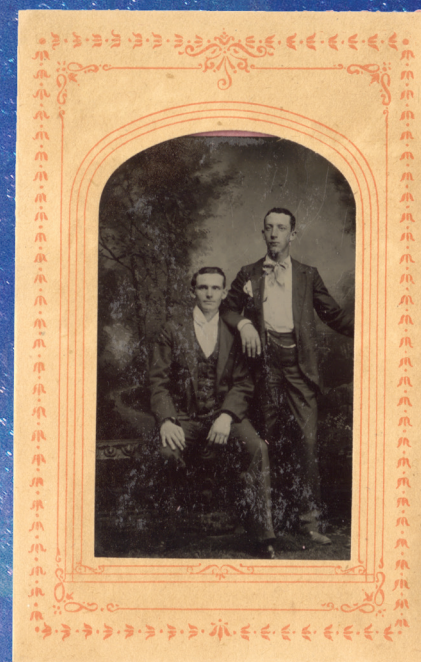
In Memoriam William Thaw.

Aug 13th 1894
In this memorial appreciation
made by one affectionate friend
and the highest merit of praise
can give to one of our
One whose later life was devoted to
closing part to all making no dis-
crimination from among the many
and this was not only seen in his
great philanthropy but in his love
of truth and one phase of truth
he cared for and fostered was scientific
truth, to him the building of the
structure was more than that, also
knowing not only for financial help in
days of our need, but of a kind of
advice also it was of so much value
from the structure in the last months
of his life he had been in the
building in the last months of his life

Allegheny Pa
Charles H. Brashear is read again
24 May 1894 from Pittsburgh



Blueprint drawn by Brashear and his associates showing a section of his new brick astronomical workshop at 2016 Perrysville Avenue, 1894. The time capsule Brashear created resided in this building's cornerstone until March 24, 2015, when it was discovered during demolition of the building after a partial wall collapse caused by a storm.



Tintype of Charles Harry Brashear and his friend Walter Dearth, taken July 1894. This piece was sealed inside an envelope in the time capsule and was one of the items that the History Center had carefully unsealed by a conservator. This is likely the last professional portrait of Charles Harry before his death in 1896.

Letter from
Prof. S. P. Langley
in answer to a question
of the curves of the
J. A. Brashear. Held at about 23° 29' west
S. Side Pittsburgh.
Oct. 11. 1874
Allegheny Observatory,
Allegheny, Pennsylvania.

Dear Sir,
I have your letter of the 6th. You
appear to have computed correctly as far
as you have gone. The interior curves
should have a common radius of about
12 inches. Your difficulty may come
from expecting an exactness which the
approximate rules given are not meant
to furnish. In any case, the actual
correction for color in a large glass is
a process of "trial and error" on the
part of the maker, who uses his theoretical
curves in the first grinding and polishing,
but expects (unless he have great ex-
perience) to need to alter them, till by trial
he gets the requisite spectrum. I should
be pleased to give you any aid
I can, and should rather recommend

Allegheny Observatory,
Allegheny, Pennsylvania.
187

you to try other curves than Herschels.
It is so nearly impossible to
convy by letter the kind of infor-
mation you need, that I, feeling
an interest in the success of
your labor, should be pleased
to have you call on me here
if I can be of service. I
should be glad to see any
optical work you have done, and
shall be here on ~~Monday~~
Monday Evening (the 19th)
Yours obs Servt
S. P. Langley
Director

Letter dated October 11, 1874, from Samuel P. Langley, then director of the Allegheny Observatory, to Brashear in response to a question he asked about the curves of the first five-inch lens that he and his wife made. Langley says that, "I, feeling an interest in the success of your labor, should be pleased to have you call on me here if I can be of service. I should be glad to see any optical work you have done."

This may very well be the first piece of correspondence between these two men whose work would be intertwined for decades. Brashear recalls in his autobiography that his first visit to the observatory was in 1876, but we now know from this letter that they were in contact two years earlier, in 1874.⁴

¹ John A. Brashear and William Lucien Scaife, ed., *John A. Brashear: The Autobiography of a Man Who Loved the Stars* (Pittsburgh: University of Pittsburgh, 2001), 61, 153.

² *Ibid.*, 61-62.

³ *Ibid.*, 143.

⁴ *Ibid.*, 128.

⁵ *Ibid.*, 130.