The Great Cincinnati Object Glass

Ormsby MacKnight Mitchel, born in Union County Kentucky in 1809, graduated from West Point Military Academy in 1829 ranking fifteenth in a class of forty-six, ranking thirteen places below Robert E. Lee of Virginia and two places below Joseph E. Johnson, another Confederate General Officer.

Mitchel, long interested in astronomy, gave many public lectures on various astronomical topics and in 1842 conceived the idea of a large Public observatory for the citizens of Cincinnati, Ohio. The Cincinnati Astronomical Society was formed for the purpose of establishing the first Astronomical Observatory in America although several feeble telescopes were in limited use. Fueled by Mitchel's enthusiasm, the Society sent Mitchel to Europe in order to select a suitable telescope, visit observatories, and learn observational methods from Europe's finest institutions.

Mitchel visited Greenwich, England and there met and established a warm friendship with the Astronomer Royal, Sir George Airy, who gave him permission to visit the Greenwich Observatory at all hours. There was not in all of England an object glass worthy of the Cincinnati Astronomical Society nor would Cauchoix of Paris promise anything within three or four years. Mitchel then traveled to Munich to visit the Institute founded by Fraunhofer who had advanced the art of making telescopes more than any man since Galileo. There Mitchel found a glass composed of two (2) elements, precisely positioned, ground and polished to an unbelievable accuracy. He immediately returned to Cincinnati to raise the $9,000.00 required to purchase this magnificent telescope. The Object Glass was eleven inches in diameter and had a focal length of sixteen and one-half feet. It was to be the largest telescope anywhere in the Western Hemisphere!

By June, 1843, Mitchel had sent the final payment for the great telescope to Merz of Munich, successors to Fraunhofer. All the moneys had been raised by public subscription. On November 9, 1843, former President John Quincy Adams and longtime Champion of Astronomy in America came to Cincinnati

and gave a speech commemorating the laying of the cornerstone for the Cincinnati Observatory atop Mount Adams.

Work proceeded on the observatory and on April 14, 1845, Mitchel was rewarded with First Light through the Great Cincinnati Refracting Telescope. Many of Cincinnati's citizens from every walk of life marveled at the wonders of the Heavens made visible with this wonderful telescope.

In 1846 Henry Twitchell of New Hampshire climbed up to Mount Adams and knocked on the observatory door in search of work. Twitchell had no formal education but was something of a mechanical and optical genius. Twitchell became Mitchel's right-hand man and when Mitchel left for travels in Europe or various lectures, he left Henry Twitchell in charge of the Cincinnati Observatory.

Although Mitchel accommodated the citizens of Cincinnati who had given moneys to establish this first American Observatory, the need to utilize this great instrument for pure scientific research became apparent to him. In the 1850's the Board of the Cincinnati Astronomical Society expressed disfavor with Mitchel's request to utilize the telescope for this purpose and Mitchel in 1854 returned to Europe not only to visit his old friend, Sir Airy at Greenwich Observatory, but also to sell Railroad bonds. By the sale of Railroad bonds, Mitchel made a quite substantial fortune.

By 1860, however, the soot from river steamboats and the general industry pollution located in Cincinnati made Mt. Adams almost totally useless for astronomical observations (A similar circumstance occurred for Royal Observatory, Greenwich, England in the 1950's.) Mitchel requested that the observatory be moved to a more suitable site; however, the Board of the Cincinnati Astronomical Society did not accept this suggestion any more than they had accepted his need for an additional telescope for scientific research.

In the spring of 1860, Mitchel accepted the invitation of the Dudley Observatory at Albany, New York to become its new Director. Henry Twitchell continued as Director at Cincinnati a year longer, but left to work at an optical concern in order to support his wife and three children.

The rest of Mitchel's story is a quick tragedy. He was appointed Brigadier General in charge of Volunteers at Cincinnati, Ohio, but even though he served with distinction, army politics stranded him in Port Royal, South Carolina where he died of Yellow Fever on October 30, 1862.

During the Civil War the Cincinnati Observatory on Mt. Adams lay dormant and was occupied by an individual variously listed as a dealer in sewing machines, an optician and a professor. His name was William Davis whose daughter married a local educator, Andrew Rickoff. Meanwhile, the steps of the observatory began to rot, one of the large Doric Columns of the front Portico toppled over, the roof leaked, the lens of the Great Refractor was burnished (scratched), and two eyepieces were missing. It was even rumored that a changeling was slipped into the place of the Great Object Glass. The new President of the Cincinnati Astronomical Society, Alphonso Taft, father of the President and Chief Justice, reported to the Society in June, 1867 that it would take two thousand dollars to put everything back in working order and another two thousand dollars for instruments.

In February, 1868, Cleveland Abbey was appointed Director of the Cincinnati Astronomical Society. He was an honor graduate from the New York Free Academy and worked under Gould at Harvard where an even larger Merz Object Glass of fifteen inches had been incorporated into the Great Harvard Refractor in 1847. Cleveland Abbey was just back from two years at Pulkova, Russia with the second Struve. Within a month Cleveland Abbe complained to the Society not only about the telescope but also general conditions which made observing useless. In disgust, Cleveland Abbey turned to Meteorology and left Cincinnati in 1869 to found the United States Weather Bureau. One of the members of the Society said, "The whole thing is dead and a disgrace to the city." The Object Glass and remaining eyepieces were removed for safekeeping.

In the spring of 1871, the newly formed University of Cincinnati offered to start an observatory if it could receive the Great Refractor and all the observational records. The cornerstone of the new observatory atop Mount Lookout was laid on August 28, 1873.

In 1875, Ormand Stone came from the Naval Observatory in Washington to the Directorship and to revive Mitchel's study of double stars. Almost immediately, due to the burnishes (scratches) and poor performance of the object glass, he arranged for it to be sent to the Alvan G. Clark Company of Cambridge, MA in 1876 to be refigured. The diameter was decreased to ten inches and the focal length was shortened to sixteen feet. In 1884, Ormand Stone accepted the position as Director of Leander McCormick Observatory at the University of Virginia in Charlottesville.

Jerome G. Porter formerly of the United States Coast and Geodetic Survey assumed the Directorship of the Cincinnati Observatory in 1884 until his retirement forty-six years later in 1930. Everett I. Yowell served as Director from 1930 to 1940 and Elliot S. Smith served as Director until he was succeeded by Dr. Paul Herget in 1943.

The above narrative history of the Great Cincinnati Telescope is a compilation of several published accounts.

Were it not for the printed advertisement concering an Object Glass for sale by one Andrew Rickoff of 1894 date and penciled notation 'purchased by Smith College 1896' sent me with an original copy of the specifications for the telescope and observatory dome by Warner & Swasey which accompanied the Smith Colledge Telescope, I would have remained sure that the provenance of the Object Glass was from Alvan G. Clark of Cambridge, Massachusetts. After all, Ms. Deborah Jean Warner of Smithsonian had attributed the Object Glass to the Clarks in her book: "ALVAN CLARK & SONS -ARTISTS IN OPTICS". Earlier, at Yerkes Observatory, I had independently come across the same annual report by William C. Winlock "ANNUAL REPORT: "ASTRONOMY FOR 1886 SMITHSONIAN INSTITUTION…1887", (p. 155.)

Quite by chance I telephoned the Astronomy Department of the University of Cincinnati and reached Mrs. Anne Herget, wife of Dr. Paul Herget and one of the most delightful personages with whom I have ever been in contact. No, Mrs. Herget had never heard of a William Davis connected in any way with Cincinnati Observatory. In a few days, however, I received a letter from Mrs.

Herget to the effect that she had found my Mr. Davis and that he had been a caretaker of the Cincinnati Observatory facilities during the Civil War and would I like to borrow her copy of the MINUTES OF THE CINCINNATI ASTRONOMICAL SOCIETY? I lost no time in telephoning Mrs. Herget to accept and thank her for her kind offer and to thank her for her kindness. Over the years, we have visited by telephone many, many times, but Dr. Paul Herget passed away just before they had both planned to visit me in Jackson and to see the Object Glass in my possession.

Prior to returning Mrs. Herget's copy of the MINUTES, I had my secretary transcribe a copy since the originals were written in longhand. I also made a Xerox copy. The MINUTES told me very little I had not known; however, it did provide a clue to the provenance of a second object glass at Cincinnati. Obviously, if I have an Object Glass and there was an Object Glass sent by Professor Ormand Stone to be refigured by the Clarks and that same Object Glass remains in the possession of the University of Cincinnati today, there must have been a second object glass. Since no optical glass was made outside of Europe during this period, at least a crown glass and a flint glass blank must have existed in Cincinnati prior to 1865.

I have spent my entire adult life in astronomy as founder and President of ObservaDOME Laboratories, Inc. I have had the privilege and pleasure of observing with some of the world's finest telescopes both antique and modern. It is with this background that I am confident to judge that the object glass in my ex-Smith College telescope was NOT made by William Davis or anyone else unless there were documented accounts in the literature of previous object glasses of smaller size and quality attributed to that maker. Many Professional Astronomers visit Observa-DOME to witness operations and performance of their respective observatory domes prior to subsequent disassembly for shipment. Many ask to observe with my antique telescope and unless inclement weather interferes, their requests are granted and without exception they comment on the exquisite definition of this object glass. These comments reinforce my judgment as to the exceptional quality of this object glass.

I believe that the object glass I have is the original Merz object glass and that the object glass refigured by the Clarks in 1876 was originally made by Henry Twitchell utilizing optical glass blanks procured in Europe by Professor Mitchel either during or after 1854. When William Davis was dismissed as caretaker in 1865, the MINUTES reflect that he removed a transit instrument made by Henry Twitchell claiming that the instrument was his property. I suspect he changed the object glass as well.

We know that Andrew Rickoff took many liberties with the truth in his praise of the late William Davis in his advertisement for the sale of the object glass to Smith College as well as liberties with the truth in writing Davis' Obituary in 1878.

One might well ask, if Davis had made such an exceptional object glass, why did he not try to sell or dispose of it during his lifetime? Such a large object glass would have a substantial monetary value, moreover, why did Andrew Rickoff wait until late in the year of 1884 to advertise it for sale to the astronomical community? Considering the cost of an observatory structure, not to mention the equatorial mounting, pier and telescope tube required to mount and utilize this object glass, one could not imagine such a valuable article to be in private hands with no hope of its utilization.

The answer is twofold: First, until the object glass in possession of the University of Cincinnati had been refigured by the Clarks in 1876, anyone would have suspicions if its provenance led to Cincinnati. Second, Andrew Rickoff had to wait until Professor Ormand Stone left Cincinnati, otherwise Professor Stone would have immediately and competently unmasked the theft of the Cincinnati object glass.

Professor Stone did just that from his new post as Director of McCormick Observatory in his letter to his successor, Professor Porter dated April 28, 1885, a transcript copy of which follows. Unfortunately, former Governor Cox, the new Chancellor of the University of Cincinnati, for political reasons, chose not to pursue the matter further.

Transcribed copy:

“University of Virginia April 28, 1885

My Dear Professor Porter:

When I went to Cincinnati, I found the Object Glass in a dilapidated condition, some one evidently tried to polish it with emery or some other hard substance. I had it refigured by Alvan Clark & Sons after which it performed better. For some months I have seen an advertisement (in various places) of an object glass claimed to be made by “Prof.” Davis who has use of the observatory after Prof. Mitchel’s departure. Not long since I received the enclosed circular, which I wish you would preserve and return to me when done with it! I had already had my suspicions aroused by the advertisements that the glass on sale was THE ORIGINAL OLD MUNICH GLASS! and this circular and its contents have deepened the suspicion. A few weeks ago I wrote to Merz to send me some evidence which would enable me to reach some positive conclusion. Of course, the data given (considering that the Cincinnati glass was refigured) would not be conclusive if applied to the glass in your possession. It would, however, if applied to the glass advertised by Andr. J. Rickoff. Of course, the family are not probably at fault and it would be cruel to visit vengeance on them for any wrong doing by their father. Moreover, the whole question is thus far only one of SUSPICION. Still if the glass in their possession is the original Munich Glass it ought at least to be recovered (if better than the other after Clark’s work upon it and the $500 expended in refiguring the other ought to be repaid to the observatory.) If Gov. Cox has accepted the Presidency of the University, I would suggest you show him this letter and the enclosed papers and ask his advice. He is a thoroughly just and liberal man and you need not fear to give him your WHOLE CONFIDENCE in regard to any matter connected with your work. Did you receive those resolutions in regard to the NAME of the observatory? With kind regards to all our old friends and especially to our neighbors at Mt. Lookout.

I am very truly yours,

Ormand Stone

I hope you will not consider me a meddler in these matters if so, and in any event use your own judgment as to their importance.

OS"

Transcribed copy of Advertisement circular:

"Yonkers on-theHudson

To Astronomers:

When the management of the Cincinnati Observatory was committed to Prof. William M. Davis, he gave his first attention to the improvement of the instruments then in use in that institution. He brought to the task a profound knowledge of the science of optics and eminent skill in the construction of scientific instruments. He first replaced the old transit instrument by a very much larger one which attracted much attention at the time. This was followed by a chronograph and other desirable additions to the apparatus of the establishment. He finally proposed to construct an Equatorial which should correct some defects in the instrument already in place. He had, however, done little more in this direction than to make the object glass when his health failed him and he was compelled to desist from any further prosecution of his designs. At the time of his death, in 1878, the glass came into the possession of his daughter, who now wishes to sell it.

This brief account of the glass seemed to be necessary to satisfy the inquiries which will be made as to its history. In regard to its quality and value it seemed desirable to obtain the opinion of a competent and impartial judge. Having obtained the consent of Prof. Young of Princeton, I sent it to him for a thorough test. For the purpose he had a suitable tube constructed and attached it to the 23-inch equatorial.

The result of the examination is given in the following extracts from his letter, dated November 11, 1884

“The focal length from the inside flange of the cell to the image is 16 feet six inches, within about 1/4 inch.

****”As the result of a considerable number of tests on stars (Andromeda especially) and on Saturn and Neptune, I have the pleasure to report that in my opinion the glass is an excellent one, fully equal to the majority of those of its size, and surpassed by only a very few.

“In detail I find:

“I. As to material. - This seems to be excellent. There are no veins or striae that are easily seen in examining the lens by placing the eye in the focus of a bright star, and none of any consequence.

“II. Finish of surface in respect to polish. - This is good. There are some spots upon the flint lens such as often form in consequence of water getting between the lenses, and, as mentioned before, there are some rather bad scratches, due to careless handling sometime. These spots and scratches, however, do no observable harm to the image, beyond causing a little stray light.

“III. Figure: - This is very good–entirely satisfactory. If anything, I think the spherical aberration is just a trifle over corrected, but not enough to make me quite positive as to the fact; certainly not enough to injure the image perceptibly.

“IV. Achromatism. - The color correction is satisfactory. In this respect there is, however, and can be, no absolute standard among opticians. If we take the Clark or Merz correction as a standard, this lens is a trifle under-corrected; but if compared with Schroder lenses it is over-corrected. The outstanding color is a little redder than is the case with Clark or Merz lenses; but on account of the long focal length of the lens this outstanding color is hardly noticeable at all, and is certainly much less offensive than in the shorter focal length lenses now usually made.

“The views of Saturn with this lens are simply exquisite. On Nov, 9th I examined the planet with special care. Nothing better could be asked as

regards sharpness and freedom from color, with powers ranging up to 500. The satellite Enceladus was easily and even conspicuously visible. Mimas (which could be seen with difficulty in ther 23 inch) was not visible.

“The glass was tried carefully on Andromedae. The little star was well defined and its color finely shown. The disc, with power of 500, was well elongated and at times notched, but not quite divided. I would have tried higher powers, but did not happen to have deeper eyepieces conveniently at hand.

“Altogether I consider the glass, as said before, an excellent one, and well worthy of a permanent mounting and constant use.

(Signed), C.A. Young

The following comparison between this glass and the objective of the equatorial at Cincinatti is taken from a description which appeared in the Cincinnati Commercial shortly after this glass was placed in use:

“But a still better penetrating and defining test is to be found in the great nebula of Orion, known as the trapezium, from the circumstances that there are four stars forming an irregular quadrilateral in a very dark space within the nebula. Near two of these stars are still another two, so faint that only the best instruments can find them out. When years ago, Prof. Mitchell announced that he could see the sixth star of this group, through the Fraunhofer, it excited a good deal of enthusiasm. Both glasses revealed them, very plainly; but there is a seventh star in a dark nebulous mass, just below the trapezium, which has been seen through the Davis glass, and which the Fraunhofer lens has failed hitherto to bring out.

“For defining and penetrating qualities, the new was fully equal to the old lens, though slightly smaller in diameter. The test was made upon several binary or double stars with uniform satisfaction.”

For achromatic qualities the Moon and the planet Venus were selected. The planet, seen through the new lens, was stripped of halo, and came out sharp and clear; the color was scarcely perceptible, decidedly less than in the Fraunhofer.

In conclusion the writer says: “For achromatic purity and penetrating power the Davis lens is in all respects equal and in some superior to the Fraunhofer, and when mounted will make one of the finest in the country.”

The cost of this “Fraunhofer” lens was about $3,000.

The Price. – The price now asked for objectives of the size of this glass–a little over 11 inches–is from $1,350 to $2,500. The price set upon this is $1,200, payable by draft on New York.

ANDR. J. RICKOFF,

Yonkers, New York”

Transcribed copy of Governor Cox’s letter to Professor Porter:

“University of Cincinnati

President’s Office

Cincinnati, 13 July,1885

My Dear Professor:

In reply to yours of yesterday, I send back Prof. Stones’ letter with the circular etc. We have no doubt sufficiently tested the grounds of doubt as to the object glass, and I am glad that the evidence is in the whole so satisfactory. It is pleasant to be assured that everything is right.

Very sincerely yours,

J. D. Cox

Prof. J. G. Porter

Observatory”