

Lewis Swift

Marathon's connection to the stars

by Jim Rienhardt

Aug., 2008

Lewis Swift was born February 29, 1820 in the village of Clarkson, Monroe County, NY. He eventually made his way to Rochester, NY and then California, yet he is buried in the Marathon Cemetery. Lewis Swift made Marathon his home for a period and continued to have connections to the area as he made his way to fame. He later retired to Marathon where he lived out the remainder of his life.



At the time of his birth the village of Clarkson was considered a frontier settlement. Swift's father, also named Lewis, was a pioneer and Lewis Jr. learned pioneering skills and resourcefulness. Lewis Sr. invented a prize-winning hay rake and opened a rake factory to produce his invention.

Lewis Jr. was the sixth of nine children. At age 13 he fractured a hip, probably in a farming accident, and was unable to walk without crutches for some time. The accident and inadequate surgery left him permanently lame. This unfortunate accident was turned into an advantage in that, no longer able to do farm work, he was able to put his time into study. At age 15 he began attending the newly opened Clarkson Academy.

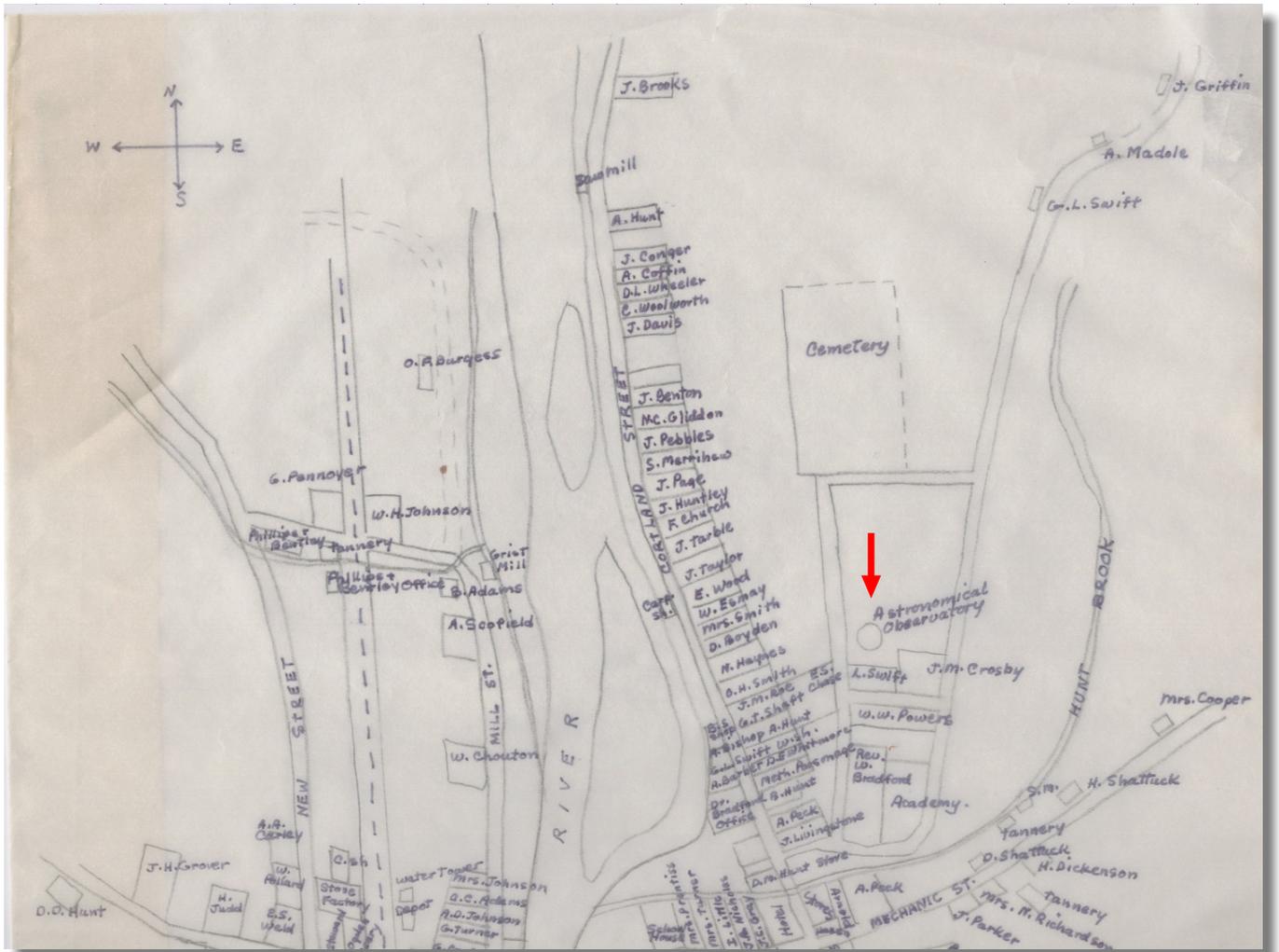
In 1843 came The Great Comet of that year which was a rare bright comet. It was bright enough to view in day light and the tail covered a large portion of sky. Swift was very impressed by this: "The comet's broad tail reached from the horizon to the very middle of the heavens; the sight dazzled me." He had also viewed Halley's Comet five years earlier. These sights must have impressed him and stayed in his memory. His pursuit of comets later in his life would bring him fame.

While living in Clarkson, Lewis probably made numerous trips to nearby Rochester which offered more opportunity than his rural home community. Here he followed the development of the telegraph. His interests in this device lead him to learn more about the developing field of electricity and magnetism. Following his interest he built apparatus to demonstrate the principles and wonders of these and set off demonstrating and lecturing with cousin George Swift of Marathon. Joining with Ezra Cornell, the Swifts traveled to Chicago to demonstrate the telegraph and form a stock company for the establishment of a telegraph line. The investors there were unimpressed and a deal was never sealed.

Eventually, he became bored with touring and returned to New York State where he married Lucretia Hunt in 1850 and settled on the family farm in Clarkson. Lucretia was the daughter of Asa Hunt and Sarah Johnson. The Cortland County village of Hunt's Corners was founded by William's father Asa Hunt.

Farming was not for Lewis, however, and he soon set off on a lecture tour demonstrating the new discoveries of the microscope with the aid of an invention of his own to project the image, allowing a large audience to view. The admission price of 20¢ gained the attendee such wonders, according to a flier announcing the demonstration as: "...Brown Sugar under the Microscope. – A Fly will extend from floor to ceiling showing 8,000 eyes."

In 1854 (or 1851) Lewis opened a hardware store in Hunt's Corners, NY. During his tours lecturing and demonstrating the microscope he also sold many instruments, such as microscopes, telescopes, barometers, magnets, etc. and, therefore, was acquainted with the selling of merchandise, so the hardware store may have been a logical step.



1863 map

During this time as a shop keeper Lewis bought his first astronomy books. Following instructions in these books he built his first telescope. This was a 3 inch refractor telescope with a hand made brass mount. With this telescope he began a systematic sky survey, most likely scanning for comets like the ones that had impressed him so many years earlier.

Lewis read much about astronomy and tried to keep up with the latest in the field. His keen interest compelled him to travel to Rochester in 1857 and 1858 to attend lectures by the director of the Cincinnati Observatory, Ormsby Mitchel. Mitchel played a leading role in establishing an observatory for the Cincinnati College completed in 1845. The observatory was one of the most advanced in the United States at that time.

Having broken his 3 inch refractor lens, Swift purchased a 4 ½ inch “comet seeker” telescope from

optical craftsman Henry Fritz. The size of these telescopes refers to the diameter of the objective lens. The larger the diameter the more light the lens collects and fainter objects can be seen. Comets are very faint when far from the sun, and to discover a comet before someone else, a larger lens is a decided advantage.

Once his new telescope was delivered he built his first observatory near Marathon. This first observatory may have been located near what is now known as Greek Peak in Virgil, NY not far from the village of Hunt's Corners.

In 1862 Lewis moved his family to Marathon. An 1863 map notes Swift's Astronomical Observatory to be located near his home on what is now Swift Street in Marathon. This observatory was a roof top construction on his barn. His first comet "discovery" followed soon after the observatory was completed, but he found that several others had observed it before him.

In the same year that Lewis Swift moved to Marathon, he made his most famous discovery. While looking for a comet that had been announced in the New York Times, Lewis noticed another faint object in the same region of sky. Another astronomer, Horace Tuttle of Harvard, had also observed this comet. After some controversy and debate, the details were sorted out and the comet became known as Comet Swift-Tuttle. This is a periodic comet and was last seen in 1992. If you missed it, it is predicted to reappear in 2126. Leave a note for your descendents!



Lucretia Hunt Swift monument, Marathon Cemetery

The following year his wife of 13 years, Lucretia, died. The Hunt family cemetery plot contains a monument with a plaque commemorating her. Lewis married his second wife, Caroline Topping, from Long Island in 1864. One son of this marriage, Edward, would discover his own comet in later years.

Lewis maintained a friendship with Prof. G. W. Hough at the Dudley Observatory in Albany, NY who helped secure his claim as co-discoverer of Comet Swift-Tuttle. In 1869 he was invited to travel to Illinois with an expedition from the Dudley to observe the total solar eclipse.

In 1872 Lewis left Marathon and moved to Rochester, NY. His first residence in Rochester proved unsuitable and he moved shortly to a house on Ambrose Street, away from the glare of street lights. Still, this site had limited sky view due to nearby houses and trees. Even so, he was able to spot a newly discovered comet and share viewing of it with interested neighbors. Swift discovered yet another comet that same year. This discovery attracted interest from influential people in the Rochester area.



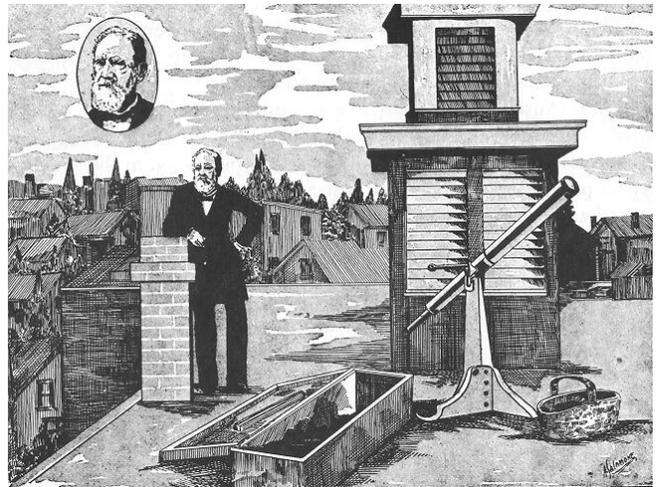
Lewis, Caroline, and son Edward age 13

Now being famous in his own backyard, and elsewhere, opportunities began to open up. An offer to use the Powers Block tower in the city for his observations proved unsuitable. Then came an offer from Congressman Selye to use his estate at Lake View Park near Rochester. His viewing sessions at this location attracted enough attention that many visitors would drop by. This fame gained Lewis an invitation as a guest lecturer at a lecture series hosted by Rochester University and acceptance of an article he had written by the *Union & Advertiser* on Mars. The article on Mars attacked the current popular notion that Mars was attempting to send us messages. Much of this controversy was bolstered in later years by the claim of canals and intelligent life on Mars by another well known astronomer, Percival Lowell. Swift was right, though, and Lowell and others were wrong - there was no life on Mars.

Now respected as an astronomer, the optical firm of Bausch & Lomb invited him to inspect their first telescope. In 1876 Bausch & Lomb hired him as an optical consultant for the manufacture of telescopes.

His willingness to hold public viewing and give free lectures made Lewis even more popular and respected. As the time for the annual Perseid meteor shower approached, Swift organized a public meteor watch and gathered valuable data on the shower due to the participation of so many willing observers. He loved to share his interests with others as many amateur astronomers do today.

An invitation soon came to mount his telescope on top of the roof of Duffy's Cider Mill, providing unobstructed views of the sky. Lewis would spend clear nights on the roof of the mill, with no protection from the elements, sometimes staying the entire night. Imagine the difficulty of the lame astronomer ascending three ladders to the roof, carrying his telescope eyepiece and objective lens in a basket. The telescope tube remained on the roof stored in a box.



Roof of Duffy's Cider Mill

Once again the objective lens was broken and another 4 ½ inch lens was purchased from Alvan Clark & Sons. This lens had superior optical properties to the former 4 ½ inch and with it he soon discovered another comet, designated 1877III. Comets were recorded by the year of discovery and a roman numeral for the order of discovery. Currently, the designation is the year of discovery and a letter/number code for the partial month and order of discovery.

Swift was a prolific discoverer of comets. When he spotted what he thought was a new one he would descend the ladders to a horse and buggy to go to the city where he would telegraph the Dudley Observatory, and then the observatory in Vienna. Then he waited. Waited for confirmation that he was the discoverer. Many times others had beaten him to it, but six times between 1877 and 1881, he was successful in being the first. The first three gained him a gold metal award from the Imperial Academy of Science in Vienna.

His success in discovery he attributed to a special eyepiece lens designed for him by a local Rochester optician. No special eyepiece, though, could be a benefit without the careful observation, persistence and observing skills of this astronomer.

Comet hunters often find many blurry-looking objects in the sky that are not comets. To reduce the

wasted time in studying these unmoving objects, nebulae, galaxies and star clusters, it is helpful to catalog these objects so they can be avoided during comet searches. Swift began the task of cataloging these in his star atlas. This effort became a consuming endeavor and took most of his observing time.

Swift continued to make discoveries and observations that proved important to astronomy, such as measurements of the transit of Venus. The transit is the crossing of Venus between the Earth and the Sun so that Venus is actually seen crossing the face of the sun. Venus transits occur rarely in cycles, two close together and then spanning over 200 years before the next pair of occurrences. Swift's transit observations would have had to be in the year 1874 or 1882. These observations were important in helping astronomers determine the distance between Earth and the Sun. Between the years of Venus transits, in 1878, he discovered a comet which brought him his second gold medal. The most recent transit was in 2004 and will occur again in 2012.

There is often controversy and skepticism of astronomical discoveries. This is the natural process of science and helps to reduce the occurrence of false claims and mistaken observations. Swift was not immune to the scrutiny of others or to making mistakes.

Solar eclipses are important events for making observations near the sun. During a total eclipse the solar corona becomes visible. This hot, wispy outer layer of the sun cannot be seen unless the sun is completely covered. Anything else near the sun would be visible at this time also. If a planet orbited the sun in an orbit much closer than Mercury then it would be observable at this time. Theorized by many respected astronomers and supported by calculations of the French astronomer Le Verrier, there may be a planet actually existing in this region. Swift viewed an object near the sun during the eclipse of July, 1878 and declared the discovery of the planet Vulcan. Swift's fame rocketed with this announcement. Unfortunately, no one was ever able to view this "planet" again and it was later proved nonexistent.



By the time the error was revealed, Swift's well established reputation saved him major embarrassment. The fact that he could make mistakes and admit it was further evidenced when he declared that a pitcher in a baseball game could not cause a thrown ball to curve. He had been questioned about this by a fan who swore that the ball did not travel in a straight line. He later witnessed a demonstration showing that it was indeed possible and his willingness to admit to the mistake gained him more respect.

In 1879 he was elected a Fellow of the Royal Astronomical Society of Rochester, and in the same year awarded an honorary Ph.D. from the University of Rochester. He would now be known as Dr. Swift. In this year he also became a Fellow of the American Association for the Advancement of Science, and in 1881 received a silver medal and monetary award from the Institute of France.

An observatory for Swift was proposed to be built in Rochester at a cost of \$6,000, plus the cost of the 9 inch telescope, another \$1,500. Raising the funds proved to be difficult. Nearly half of the funds had been raised in 1879 when Hulbert Harrington Warner offered to build an observatory at the cost of \$20,000, provided that Swift and the people of the city of Rochester would commit to funding a better telescope, a 16 inch refractor, at an estimated cost of \$12,000. Warner would match dollar for dollar any funds raised for the telescope and also set up a fund to pay Swift to run the observatory. Fund raising went well after this and soon \$12,500 had been raised for the telescope.

Swift's travels gained him a fuller appreciation of what a fully equipped observatory might include, such as a

spectroscope, a sidereal clock, as well as other apparatus and an astronomical library. Warner's patent medicine business was prospering and he set aside \$100,000 for the construction of the observatory. Warner bought property for the observatory not far from his home on East Ave. Construction of the observatory building was completed in 1882 and the 16 inch diameter, 22 foot length Alvan Clark telescope was installed. The finder scope mounted on this telescope had a diameter of 3½ inch, larger than the first telescope that Swift crafted for himself years earlier.

Before the completion of the Warner Observatory, and while still observing from his cider mill location, Swift discovered two more comets in 1881. Again he was awarded a silver medal and 540 francs by the French Academy of Sciences. Lewis had been running a hardware store in Rochester and now, in 1882, with the completion of the Warner Observatory, closed the business and became a full time astronomer.

Every part of the observatory was first class from the elevator that carried Swift to the observing tower to the furnishings of the observatory and Professor Swift's living quarters in the same building. No one could ask for more.

The Vienna Observatory discontinued its award of a gold medal to the first discoverer of new comets in 1881. Warner decided that his new observatory should then take on this task and announced an award of a gold medal and a cash reward of \$200. Dr. Swift was appointed the judge of these awards. Now Lewis was *the* authority on the comets which fascinated him as a youngster and eventually brought him fame.



Warner "Castle"
East Ave., Rochester



rpf00023.jpg Rochester Public Library Local History Division

The first full year of operation of the observatory was 1883 and Swift discovered another comet in this year. He did not discover another until 1889, but his primary mission was now to record additions to the lists of nebulae compiled by the famous astronomers Caroline and William Herschel. Swift charted more than 1200. The new list was combined with Herschel's and others into the New General Catalogue by Danish astronomer Dreyer in 1888.

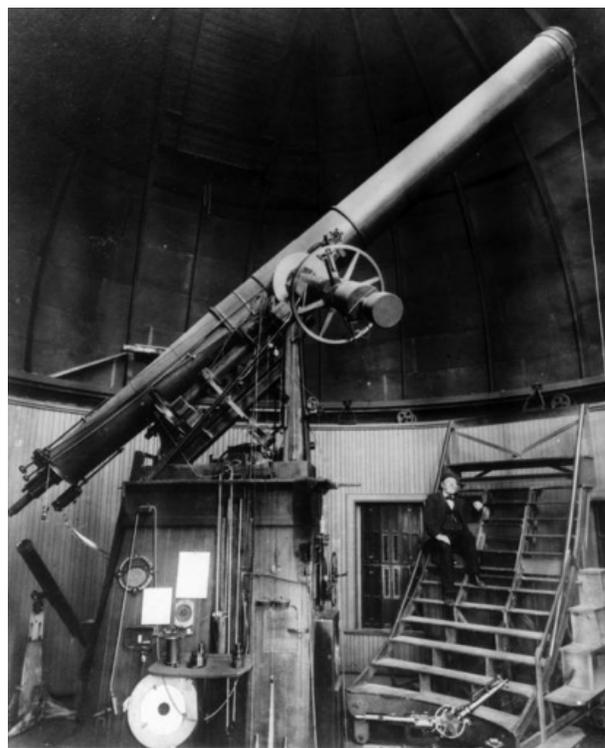
True to his personal goal of making astronomy available and understandable to the public, the Warner Observatory was open to the public for free on Tuesdays and Thursdays. Other times visitors could gain access through the purchase of a 25¢ ticket. The observatory soon became a major tourist attraction. The observatory was a leader in public outreach. It was the first major observatory regularly open to the public.

It was the first observatory of any size in the world to which the public was welcome, and many entered to enjoy their first close-up view of the heavens. Visitors to the city were invariably driven out to see it; many, over the years, came to Rochester expressly to visit the observatory. In recognition of the public service of the Warner Observatory, the state legislature passed a bill exempting it from taxation.

-*Rochester History, ob sit*



Interior of the Warner Observatory



Lewis Swift also gave lectures outside of the observatory and wrote numerous articles for the *Sidereal Messenger*, the *Cosmopolitan*, European journals and 52 “Simple Lessons in Astronomy” for the *Union & Advertiser*.

By 1888 the activity at the observatory began to decline and Swift became increasingly annoyed with the Rochester weather. To make matters worse, by 1892 the construction of the new Third Presbyterian Church next to the observatory blocked a major portion of sky from view. A trip in 1889 to the new Lick Observatory in California and a taste of the weather and viewing with the 36 inch refractor there must have also added to Lewis’ desire to move on. In 1893 Rochester’s electric lights surrounding the Warner Observatory created enough light pollution to make observing nearly impossible. Swift and Warner were feeling that the people of Rochester had lost interest in their prized observer and observatory.

Lewis Swift planned to take the 16 inch telescope and accept an offer to join the faculty and install it at Westminster College in Denver, Colorado. Warner forbade Swift to remove the telescope, and Westminster rescinded the offer, apparently more interested in the telescope than in Swift. To appease Swift, Warner paid for a trip out west. While there he visited Lick Observatory again and his astronomer friend Edward Emerson Barnard who convinced Lewis that he should move west.

After cataloging another 60 nebulae and discovering another comet in 1892 Swift and the Warner Observatory were dealt a final blow during the financial panic of 1893. Warner's business failed and he could no longer support the observatory and Swift. The Warner Observatory was demolished in 1931 after sitting vacant for nearly 40 years. The decorative stone gate, however, remains.

Fortunately for Lewis Swift another wealthy individual, Thaddeus Lowe, who was building a resort on Echo Mountain near Pasadena, offered him a position. The resort included two hotels, a museum, a zoo, horseback riding trails, and an observatory. After considering numerous other offers, Lewis decided to join Lowe. Now in 1893 at age 73, he moved west with his wife Caroline and son, Edward. Pasadena welcomed him with ceremony.

During the first year at Echo Mountain Lewis' son Edward made his first comet discovery. It turned out to be a comet that was discovered earlier in 1844. This fact though was not realized until 1963.



Lowe Observatory

Lewis was impressed with the sky view from the Echo Mountain observatory that he wrote an article for Popular Astronomy Magazine in 1896. In this article he comments on a star cluster that he has observed, "In that small space there are many thousand stars. . . , suns every one, no doubt doing the same service as our Sun, warming, lighting, guiding and fertilizing a system of planets where people no doubt are dwelling the same as here".

The Lowe Observatory was destroyed by a wind storm in 1928. The 16 inch objective lens of the Lowe Observatory telescope was installed in a refurbished telescope at Santa Clara University.

In 1901, Swift's failing eyesight forced him to retire from observing. During his long career he had discovered 13 comets and 1248 previously uncataloged nebulae. Many of his papers were lost and the Lowe Observatory nearly destroyed in a wildfire of 1900.

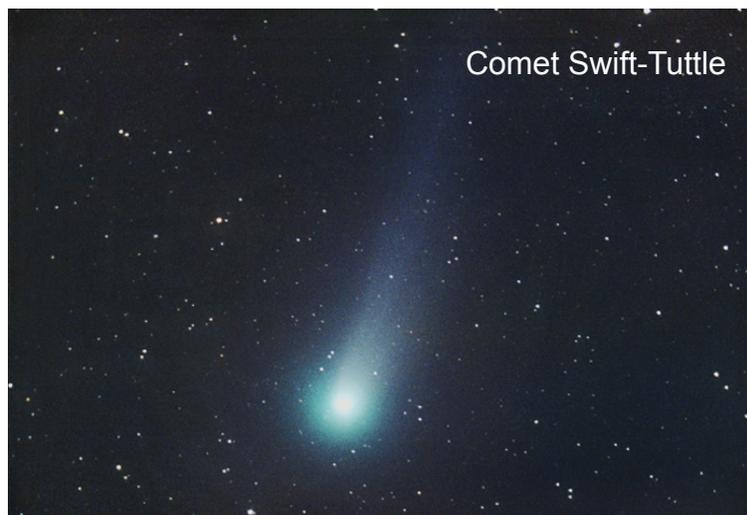
Swift remained in California for another three years after retiring, helping to plan the construction of the Mount Wilson Observatory. At age 84, in 1904, he returned to Marathon to live with his daughter, Mrs. Walter Brink.

Lewis Swift died in 1913 at the age of 93. The location of his favorite 4 ½ inch "comet seeker" telescope is unknown as well as most of his observing books. These, it is thought, were given to his son Edward. Some of Swift's "mechanical devices used in his early lectures" were supposedly donated to Cornell, but I have found no one at Cornell who knows of these items.

Lewis Swift was an amateur astronomer who gained fame and employment doing what he loved. He enjoyed sharing his knowledge and wonder of the night sky with anyone who would show an interest.



Cemetery at Marathon, NY
Hunt family plot. The three upright
stones in the foreground are Caroline
Topping, Lewis Swift, Lucretia Hunt.



Comet Swift-Tuttle

Thanks to Marathon Historian, Pat McConnell
and to Sabrina Renner for editing

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