One winter night in the mid-1930s, my father had reserved the 100-inch to photograph the ninth satellite of Jupiter, which he had discovered while a graduate student at the University of California. Since the satellite was very far from Jupiter, its orbit was subject to many perturbations and it had to be observed frequently in order to keep it from getting lost. Incidentally, it was also possible that another satellite might be found.

For several months prior to the scheduled observation, Dad had told me many times about the importance of getting a good plate. First, a guide star had to be carefully observed and tracked to overcome slight periodic errors in the telescope drive and to compensate for atmospheric refraction. Second, the plate holder had to be moved at precise intervals in order to correct for the differential motion of Jupiter. And all this had to take place over an exposure of a couple of hours.

It was obviously a task that could be accomplished only by a very careful and experienced observer. As the scheduled day approached, however, I became convinced that I was up to the task and asked permission to make the exposure. Dad expressed doubt that such an opportunity should be entrusted to a raw recruit, but said he would think about it. Finally he agreed, with apparent reluctance, to let me make the exposure.

On the afternoon before the event, we had a dress rehearsal at the Newtonian focus of the 100-inch and I felt that I was ready. When night came and Jupiter was well up in the eastern sky, we went to the dome, loaded the plate holder, and climbed the steps to the platform. After inserting the plate holder and moving the telescope into position, I sat down in the observing chair, located the guide star, and prepared to begin the exposure.

Dad then bid farewell and retired. All went well and I could see that this was going to be a piece of cake. As time went on, however, I began to realize why Dad had left the platform. IT WAS COLD! Of course I couldn’t leave the chair to stomp around the platform in an effort to keep warm. I had to stay glued to the eyepiece in order to make the differential corrections. Remember, this was before the days of down jackets and warm, light clothing — no electrically heated flying suits, either. Somehow I survived the numbing experience and finally inserted the dark slide, at which time Dad reappeared on the platform, warm and comfortable. We developed the plate in a warm darkroom and I partially thawed. Close examination of the plate did reveal the ninth satellite, but no others. That had to wait for a later day.

In retrospect, I’m sure that Dad, who had been through this chilling experience many times before, knew all along that he would let me make the exposure. He didn’t want to give me the opportunity to back out, but led me down the long garden path to the coldest experience I have ever had.

Don’s father, Seth Nicholson, went on to discover the 10th, 11th, and 12th satellites of Jupiter with the Mount Wilson 100-inch telescope, tying Galileo’s record of discovering four Jovian moons. More about Don is on page 6.

This account appeared originally in the December 2000 Reflections.
SOLAR OBSERVER STEVE PADILLA PROFILES IN LOS ANGELES TIMES

Los Angeles Times reporter Thomas Curwen and photographer Al Seib did a very nice profile of Steve Padilla, published on October 28, 2013, entitled “Capturing the Mysteries of the Sun One Drawing at a Time.” The article described in evocative detail what it is like to work on Mount Wilson and Steve’s ongoing dedication to continuing the tradition of sunspot drawings dating back to 1917 through observations taken from the 150-foot solar tower. The 150-foot solar tower is overseen by UCLA professor emeritus Roger Ulrich, who was quoted in the article: “The problem is,” Ulrich says, “we don’t know what’s going on inside the Sun. The drawings won’t answer that, but they can help us understand the cyclical nature of sunspots.” Ulrich went on to warn that the telescope’s annual budget of $250,000, cobbled together from grants from NASA and the National Science Foundation, runs out in the spring [of 2014], and “odds of getting more money from NASA are long.” Thus, a nearly 100-year-long scientific record is in jeopardy of being suspended. The drawings are used by the Space Weather Prediction Center in Boulder, Colorado, to help forecast solar flares. The agency correlates findings from Mount Wilson with similar observations from Australia, Italy, and New Mexico. As Curwen notes, “It’s one of those jobs that’s easy to overlook until all hell breaks loose, as it did when a solar storm caused a blackout in Montreal, tripped sensors on the space shuttle, and led some to believe a nuclear attack had begun.” The Times article may still be available at www.latimes.com through their search engine.

KEEP UP WITH MOUNT WILSON OBSERVATORY ON FACEBOOK

Have you visited Mount Wilson Observatory’s new Facebook page? You can get there by going to the main Observatory website, www.mtwilson.edu, and clicking on the “Facebook” link. Check back frequently for news about the Observatory and items of astronomical interest.

DEEP SPACE NETWORK 50TH ANNIVERSARY

NASA’s Deep Space Network has been the critical link between Earth and deep space probes for 50 years. A free talk entitled “The History and Future of Space Communications: Celebrating 50 Years of the NASA Deep Space Network” will be presented at the Jet Propulsion Laboratory on Thursday, February 13, and at Pasadena City College on Friday, February 14, both at 7 p.m. Information: www.jpl.nasa.gov/events/lectures.

FEYNMAN LECTURES NOW FREE ONLINE

Nobel Prize-winning theoretical physicist and polymath Richard Feynman taught a freshman physics course from 1961–1963 at Caltech that was published in 1964 in three volumes as The Feynman Lectures on Physics by Feynman and fellow physicists Matthew Sands and Robert Leighton. As described by Rob Phillips in Nature on December 5, 2013, “Feynman’s physics is about simplicity, beauty, unity, and analogy, presented with enthusiasm and insight that bursts from the page.” The lectures retain their popularity and have garnered a universal following among physics students, but also among legions of the public who just want to learn about physics. Read and enjoy for yourself — two websites feature all the lectures:

www.feynmanlectures.info/
www.feynmanlectures.caltech.edu/

FOMWO Membership

Friends of Mount Wilson Observatory offers a variety of tax-deductible membership levels and benefits. For information on how to become a FOMWO member, visit www.mtwilson.edu. Also see page 8 of this issue of Reflections for more ways to support the Observatory. We welcome donations and volunteer efforts of all kinds, and we thank you.
Reflections by the Director

You may have come across the materials on our website comprising our proposed Second Century Campaign, a very ambitious plan for developing a major visitor center on the mountain along with a variety of outreach programs on- and off-site. As with any such plan, the motivations are wide-ranging, but inevitably return to our need to develop new and expanded income streams to ensure the health of our stewardship of the Observatory while providing the Southern California community with new opportunities to inspire future scientists and celebrate the greatness of Mount Wilson Observatory. Of course, our supporters will ultimately tell us what they need from us by virtue of the nature of their gifts.

My own personal perspective on the Second Century Campaign continues to focus on the Observatory’s heritage and the irresistible call to preserve that heritage for those who come after us. In that vein, I thought I would devote this quarter’s column to sharing with you the introductory section I wrote in the lengthy action plan document for the campaign entitled “A Prelude on Preserving Mount Wilson Observatory.” Here it is:

What is the value in preserving Mount Wilson as a science heritage site?

It is inevitable and appropriate to ask some “what if” questions. What if founder George Ellery Hale had never abandoned his Yerkes Observatory, in its poor mid-continent observing climate, to build a radically new kind of celestial outpost high above the orange groves of coastal Los Angeles? Would someone else have constructed the succession of telescopes Hale built — the 60-inch and 100-inch Mount Wilson reflectors from which an astronomical revolution was unquestionably launched — and then, eleven years after his death, Hale’s 200-inch giant on Palomar intended to reach well beyond the grasp of the 100-inch to probe the very edge of the universe and the beginning of time? History strongly suggests that the answer is “no.”

Would we yet know a universe vastly larger than ever before imagined and filled with countless galaxies racing apart from each other as the result of that truly universal event prosaically dubbed the Big Bang? What would now be the frontiers of our knowledge of the astronomical universe? Would we today still be confronting the puzzling dilemma encountered by a young Edwin Hubble on Hale’s mountaintop in the early 1920s?

We can blithely reassure ourselves that, surely, some other visionary would have stepped into the void and led us down the path to where we are today had Hale, his brilliant staff, his unrivaled instruments, and the succeeding generations of their astronomical descendants not already cleared the way for us. Nevertheless, one must ask… Would we really know what we know today had those great telescopes on Mount Wilson never been erected?

This unanswerable question is the underlying essence of the incomparable science heritage of Mount Wilson Observatory. How can we not preserve and venerate this place as hallowed ground in the human quest for understanding? What aspect of human excellence and achievement is more worthy?

Hal

Harold A. McAlister, Director
Mount Wilson Observatory
Mount Wilson Winter Memories

Festive Days of Christmas

During the twenties and early thirties, my family often spent the Christmas holidays at the Kapteyn Cottage on Mount Wilson. Those were festive occasions and with a little luck we might get snowed in and miss a few days of school. Part of the ritual was cutting and decorating the Christmas tree. My sisters and I would start sometime in the previous summer scouting the mountaintop for the ideal specimen. We usually found one somewhere in the area northwest of a line between the Museum and the 100-inch. When the holidays finally arrived, and with Dan Tracey, the resident ranger, conveniently looking the other way, we headed with Dad for the tree. After quickly cutting it, we brought the tree to the cottage. There it was decorated under the supervision of my older sister, after which it filled a large part of the small, but still the largest, room in the cottage.

— Don Nicholson

A Christmas Gift from Dr. Stromberg

The Observatory never closed for holidays, not even Christmas. If it was the dark of the moon, my father, Roscoe Sanford, would be scheduled for a five- or six-night shift. However, he never spent Christmas Eve or Christmas night observing because Dr. Stromberg (who had no children) would take those nights so that Dad could spend Christmas with us five kids. Winter nights were some of the best for observing. If there was a winter snowstorm and it was Dad’s turn to observe, he would take the stage (the truck that delivered supplies) as far as it could be driven up the toll road (there were no snowplows) and then he would hike in the snow to be at the Observatory for the excellent viewing conditions that would occur after the storm. I vaguely remember being up at the Kapteyn Cottage when it snowed and from somewhere Dad found a sled and pulled me around on it. I was probably three or four years old.

— Jane Sanford Lewis

Santa Visits Mount Wilson

I lived in the cottage directly below the 6-inch instrument with my parents, Milton and Helen Humason, from 1917 to 1921. Dad and I found a Christmas tree near the toll road (there were no snowplows) and then he would hike in the snow to be at the Observatory for the excellent viewing conditions that would occur after the storm. I vaguely remember being up at the Kapteyn Cottage when it snowed and from somewhere Dad found a sled and pulled me around on it. I was probably three or four years old.

— Jane Sanford Lewis

While I cannot remember that anything very special was made of Christmas for the observing staff at the Monastery, I am sure that the basket of food taken to the galley for midnight lunch on Christmas Eve was something a little out of the ordinary. I do remember one particular Christmas when my mother and stepfather, Norma and Arthur Wright, who ran the Monastery in the early thirties, let me wrap my own presents. I was given a number of boxes of miniature animals and the temptation to peek into the boxes before they were wrapped was irresistible. We lived then in the small, but comfortable, quarters next to the kitchen. There was a bulletin board with places for the observing staff to put notices indicating their needs for meal service for the day — whether they would be present for breakfast, lunch, or dinner.

All this was after my stepfather had to give up his position as night assistant on the 60-inch because of severe asthma. In retrospect, life was pretty quiet for a young girl on the mountain. It did have its rewards, however, and while it was far from a Christmas experience, the wonderful pool at the Hotel was a great summer attraction.

— Joanne Wright Zavick

Over the years from 1994 to 2004, Reflections has printed these brief memoirs of Christmas on Mount Wilson by the sons and daughters of scientists and staff members who lived and worked on Mount Wilson. They give a unique perspective on what it was like to be a youngster on the mountain in winter in those days gone by.

Edison R. Hoge, courtesy Virginia Hoge
went sledding on Jones’ Hill (in back of the 100-inch). A fellow just doesn’t forget a Christmas like that. Because the tree was too large for our cottage, Dad cut it off some 4 feet above the ground. From this 4-foot remainder, two symmetrical shoots developed and grew vigorously. I was janitor at the Observatory during the summer of 1933 and recall noting this substantial double tree at that time.

— Bill Humason

Snowy Days on Mount Wilson

My recollections of Mount Wilson in the early 20s are of being pulled on a sled while it snowed and another time of Mother worrying if Daddy would have to fight fire, as a fire was burning in the back country at that time. Other memories are of the thrill of riding to the top of the 150-foot tower and walking the catwalk around the 100-inch dome. Echo Rock with no rails at that time was exciting.

Staying at the Kapteyn Cottage meant we had to be quiet in the morning while night staff slept, drinking canned milk (ugh!) because there was no ice box, and being restricted to the immediate back of the cottage because of the drop off in front of the cottage. It was not a “vacation” for my mother with five kids!

In winter in Pasadena after every storm we judged the snow depth at Mount Wilson by whether the snow was down to Henninger Flats or had covered the “T” below Henninger Flats. We knew it would mean a long hike for the astronomer going up that day since the Observatory truck would only get to the snow. The road would not be plowed.

We took our visiting flatland relatives to Mount Wilson on the old toll road, a scary ride they never forgot even though they were thrilled with the view when they reached the top.

— Jane Sanford Lewis

Snowbound in the Kapteyn Cottage

It was Christmastide 1920 and my parents, Drs. Hannah and Edison Pettit, had recently come out to Pasadena from Yerkes Observatory, where they had both earned their PhD’s. Edison had joined the Mount Wilson Observatory staff, where he stayed for the next 40 years. Their first Christmas in sunny California was to be spent with their infant daughter, Helen, in the Kapteyn Cottage “on the mountain.”

Like the Donner Party, they were unaware of the then-unpredictable winter weather in the Sierra Madres. It chanced that everyone else associated with the mountain had gone down the primitive toll road to Pasadena, leaving them alone. Well, it snowed and it snowed and it snowed. When it finally stopped, they were snowbound. When their food was gone and hope was fading, a relief team reached the Observatory. Strong arms helped Edison carry Hannah and her baby across the face of the mountain, down a trail, and out to safety. Although this happened before I was born, my parents often told me the story, and I tell it now to you so that it will not be forgotten.

— Marjorie Pettit Meinel

The Mount Wilson Hotel

Responding to our article about the Mount Wilson Hotel in the September 2013 Reflections, Richard Andersen, now living in British Columbia, wrote the following. Mr. Andersen visited the Observatory as a high school student in 1947-1950, and was permitted to participate in observations at the 150-foot solar tower with Joe Hickox and the 100-inch telescope with Bill Miller. Mr. Andersen wrote a series of articles entitled “Observatory Memories” for Reflections in 1999.

All of [Reflections] was interesting but I was particularly fascinated by the section about the Mount Wilson Hotel. I stayed in that hotel many times. The building portrayed in the [postcard] color image was clearly part of the hotel as it existed in my time. By then the stone fireplace appearing on the end of the building was an interior structure and a lecture room extended the building towards the west from where the photo was taken.

The fireplace was on the west side of a comfortable lobby and, in winter, had a fire burning in it continuously. I warmed myself in front of it on many cold snowy days. The hotel was a rundown ramshackle establishment but much of its charm was associated with that condition. I have fond memories of the place.

— Richard Andersen
HAPPY 95th BIRTHDAY TO DON NICHOLSON

The strongest living link Mount Wilson Observatory has to its great heritage is through Don Nicholson, who turned 95 on Wednesday, October 16, 2013. Don’s father, Seth, was among the early astronomers hired by founder George Ellery Hale to work at this wonderful place.

Seth Nicholson, whose primary responsibility was as the solar observer at the 150-foot solar tower telescope, tied Galileo in his discovery of four moons of Jupiter and enjoyed a distinguished and prominent career in astronomy internationally. Thus, as a boy, Don grew up amidst the greats we know of today — Hubble, Humason, Michelson, and all the luminaries who passed through the world’s greatest observatory — thinking of them simply as his Dad’s co-workers.

After retiring from his own technical career, Don has devoted himself to Mount Wilson first as a key member of the Mount Wilson Observatory Association and presently as the Associate Deputy Director for Public Affairs of the Mount Wilson Institute. He continues to conduct inspiring training sessions for the cadre of Mount Wilson docents and regularly meets with the Mount Wilson Institute Board of Trustees to provide his insights on how we might improve our programs of public outreach. Don is an inspiration to all of us devoted to this mountaintop, and we value his insight, his wit, and his wisdom immeasurably.

The photo above is from a recent lunch get-together with Observatory Director Hal McAlister at Caltech’s Athenaeum. In case you can’t tell, Don is the young man on the left.

Happy Birthday, Don, with love and admiration from your Mount Wilson family.

Hear the Glass Armonica Again

During the Transit of Venus event at Mount Wilson Observatory in June 2012, guests enjoyed hearing William Zeitler perform on a glass armonica. Mr. Zeitler wrote “Our Last Transit of Venus” in honor of the 2012 event, giving its first live performance on transit day at Mount Wilson. As Bob Eklund wrote in the June 2012 Reflections, “The glass armonica is an ethereal-sounding instrument played with the hands touching rotating disks of glass. Benjamin Franklin invented this instrument in 1761, when the first of the two famous 18th-century transits occurred. Rotated by a foot-pedal, it consisted of 37 glass bowls mounted in an iron spindle. The sound was provided by touching the rims of the bowls with moistened fingers.”

Southern Californians can again hear this fascinating instrument played by Mr. Zeitler in spring 2014. A concert entitled “Music of the Hemispheres: Ben Franklin and the Glass Armonica” will be presented on Saturday, March 15, at 8 p.m. at St. James Episcopal Church, 1325 Monterey Road, South Pasadena, and on Sunday, March 16, at 3 p.m. at All Saints Episcopal Church, 504 North Camden Drive, Beverly Hills. The program will include works by W.A. Mozart, traditional Scots and Irish tunes, musical Americana, and readings from Benjamin Franklin’s letters, speeches, and publications. The concerts are presented by Les Surprises Baroques, a Southern California–based organization that specializes in “innovative historically informed performances of Baroque music on period instruments.” More information can be found at www.lesurprisesbaroques.com. Mr. Zeitler, the glass armonica virtuoso, has recently completed a book, The Glass Armonica — The Music and the Madness. Information about Mr. Zeitler’s recordings (he has released seven albums of original compositions written for the instrument) and books may be found at www.williamzeitler.com.

The glass armonica being played by William Zeitler on transit of Venus day at Mount Wilson. Image from the webcast provided by Mike Simmons.

Mr. Zeitler as Benjamin Franklin performing on the glass armonica.

DON NICHOLSON, SUMMER 1935.
During the Great Depression, Don took a job at the Mount Wilson Hotel, having duties of room clerk, bellhop, busboy, lifeguard, and operator of the hotel’s Tinsley 12-inch Cassegrain telescope. In his wry manner, Don wrote: “I chose the objects to be viewed in the evenings and was in a position to flaunt my knowledge of astronomy to an admiring public.” (From “The Job from Heaven,” Reflections, December 2004.)
Exploring the Towercam  by Bob Eklund

No doubt you’ve already looked at the view from Mount Wilson via the Towercam, that little video camera perched atop the 150-foot solar tower (obs.astro.ucla.edu/towercam.htm). And if you’ve looked once or twice, you may think there’s not much else to see. Think again, because the Towercam has secrets for you. For example, it can:

• Show you the current weather at Mount Wilson’s 5700-foot elevation.
• Let you see above the clouds, when it’s all socked in with a marine-layer cloud cover in the city (inspiring, on a soggy gray morning).
• Give you incredible views of sunrises and sunsets.
• Give a snapshot of Los Angeles basin air quality and cloud cover.
• Let you sip a “moonlight cocktail” of the full Moon rising over the San Gabriel Mountains.
• Give you a peek at what’s happening right now (a new image is downloaded automatically every two minutes) at the Observatory.

The Towercam is owned by UCLA and operated by Mount Wilson Observatory’s 150-foot tower crew. Images can be downloaded, but remember that they are copyrighted by the UCLA Department of Physics and Astronomy.

Check out the view, especially at sunset and twilight time, and enjoy!

FAREWELL, COMET ISON

Dubbed the “Comet of the Century” shortly after its discovery, comet ISON was anticipated to blaze like the full Moon in the sky — that is, if it survived its passage around the Sun on November 28, 2013. ISON got lost in the Sun’s glare while being tracked by the Solar and Heliospheric Observatory (SOHO) and Solar Dynamics Observatory (SDO). Alas, only a dim ghost of ISON survived the comet’s skim by the Sun. A headless streak emerged into view out from the other side of the encounter. Though the “ghost” traveled along the comet’s originally prescribed track, it faded steadily, with no sign of cometary activity. More history is at www.isoncampaign.org/.

Comet ISON streams toward the sun from the lower right in this image from the ESA/ NASA Solar and Heliospheric Observatory (SOHO) mission, captured at 3:07 a.m. EST on November 27. A coronal mass ejection is seen under the Sun.

This is a timelapse series of images of comet ISON as viewed by SOHO. This image is a composite, with the Sun imaged by NASA’s Solar Dynamics Observatory in the center, and SOHO’s two coronagraphs showing the corona. The most recent image in this is from 5:30 p.m. EST on November 29.

ISON at 1 o’clock in SOHO’s field of view on December 1 — a wispy reminder of what was hoped to be the Comet of the Century.
OBSERVATORY STATUS
The Observatory and Skyline Park are closed to visitors for the winter. Traditionally, the Observatory opens to visitors starting in April from 10:00 a.m. to 5:00 p.m. daily to December 1, weather permitting. Watch for the re-opening of the Observatory in spring 2014, as well as the Cosmic Café at the Pavilion, offering fresh-made sandwiches and Observatory memorabilia, open Saturdays and Sundays from 10:00 a.m. to 4:00 p.m.

GUIDED WALKING TOURS
Docent-led walking tours are on hiatus until spring 2014. When the Observatory re-opens, the walking tours will be held on Saturdays and Sundays at 1:00 p.m. Guests on these tours are admitted to the telescope floor directly beneath the historic 100-inch telescope.

SPECIAL GROUP TOURS
Group daytime tours may be available during the winter. Reservations are required and a modest fee is charged. For information, please visit the Observatory website — www.mtwilson.edu.

LOOK THROUGH THE 60-INCH TELESCOPE
Mount Wilson's 60-inch telescope provides incredible views of some of the most beautiful objects in the night sky, and is among the largest in the world accessible to public viewing. Visit www.mtwilson.edu for information.

DIRECTIONS TO MOUNT WILSON OBSERVATORY
From the 210 freeway, follow Angeles Crest Highway (State Highway 2 north) out of La Cañada Flintridge to the Mount Wilson–Red Box Road; turn right, go 5 miles to the Observatory gate marked Skyline Park, and park in the lot below the Pavilion. Walk in on the Observatory access road (far left side of parking lot) about 1/4 mile to the Observatory area. The Museum is opposite the 150-foot solar tower. The U.S. Forest Service requires those parking within the Angeles National Forest (including Mount Wilson Observatory) to display a National Forest Adventure Pass. It can be purchased for $5 (one day) or $30 (season) at the Cosmic Café at Mount Wilson, or at Clear Creek Ranger Station, Red Box Ranger Station, or major sporting goods outlets. Passes are also available for purchase online at National Forest websites. Display of a National Parks Senior Pass or Golden Age Passport is also acceptable.

FRIENDS OF MOUNT WILSON OBSERVATORY MEMBERSHIP

Please visit www.mtwilson.edu for information on FOMWO membership and benefits.

THREE WAYS TO SUPPORT MOUNT WILSON OBSERVATORY
Mount Wilson Observatory receives no continuing state or federal support. You can help ensure the continued operation of this science heritage site with your tax-deductible gift in one of three ways —

★ Join the Friends of Mount Wilson Observatory (FOMWO) to receive a variety of member benefits and stay informed on the latest scientific and other activities on the mountain. All levels receive a membership packet, a one-year subscription to Reflections, a Mount Wilson—Window on the Stars video, and a 10 percent discount at the Cosmic Café as well as on Observatory merchandise purchased at the Café.

★ Contribute to our Fire Recovery Fund to assist with repairs resulting from the massive 2009 Station fire, to provide resources for mitigation of our continuing exposure to fire danger, and to make up for income losses due to long-term closure of the Observatory to public access.

★ Contribute to our Second Century Campaign. As Mount Wilson continues into its second century, a capital campaign is being developed to preserve this great Observatory for future generations. The major element of the Second Century Campaign is a wonderful new Visitor Center that will transform Mount Wilson into an important Southern California destination.

Please visit our website at www.mtwilson.edu for more details. Your support is deeply appreciated and is essential to the preservation of this world-class treasure of science and engineering. We thank you!