The Thousand Steps

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Quarrying in Jacks Narrows and Silica Brick Operations in Mount Union

In the latter half of the 1800s, the American iron and steel industry experienced rapid changes in steel production. New types of steel furnaces were being used to meet emerging technologies. Modern furnaces needed refractory liners able to withstand higher temperatures. Domestic fire clays could not meet this standard, but silica brick (aka, refractory brick, firebrick) could be heated to 2,300 degrees and yet would retain excellent load-bearing qualities without spalling or cracking. Previously, the United States had to import silica products mostly from Wales, at the time the largest producer of silica products in the world.

In 1899, the first major silica brick plant in the United States opened in Mount Union, Pennsylvania as the **W.H. Haws Fire Brick Company** headquartered in Johnstown, Pennsylvania. They made 60,000 bricks per day to be used mainly in coke ovens for making iron, and later for steel. Within a year, **Harbison-Walker Refractories Company** (herein H-W) of Pittsburgh purchased and operated the Mount Union plant, producing thousands of silica bricks each day. In 1901 a competitor, **Mount Union Silica Brick Company**, opened to produce 50,000 bricks per day. By 1903, H-W added plant #2 to increase production to 140,000 bricks per day, making it the largest producer in Mount Union.

Interestingly, in 1904 another silica brick company, **Federal Refractories,** opened a plant in nearby Alexandria, Pennsylvania.

In 1911, a third company opened in Mount Union, called **Mount Union Refractories**.

The **East Broadtop Railroad** was a narrow gauge rail line that supplied coal and coke to H-W in Mount Union. All the while the **Pennsylvania Railroad** hauled the completed bricks to market, mainly to distant places such as Johnstown, Pennsylvania and Pittsburgh. Eventually, the **Harbison-Walker Railroad** was started. More on this later.

<u>Harbison-Walker Refractories Company along the Juniata River</u>

H-W production depended upon having a large supply of raw material used in brick making, called Tuscarora quartzite. H-W located their plant at the southeastern end of Jacks Narrows, the split in Jacks Mountain where the Juniata River flowed through. Geologists estimated the Tuscarora quartzite strata to be 400 feet thick in this area. The rock was almost pure silica with traces of titanium, aluminum oxide, clay and lime. The quartzite was called ganister, a slang word Welsh miners used to describe a hard rock strata often separating veins of coal.

To surface mine the ganister, H-W built a narrow gauge railroad, called the Harbison-Walker Railroad. It was much like rail lines used by the logging industry of the era. The south side of

Jacks Narrows between Mount Union and Mapleton was mined first. Empty rail cars were pulled to the work areas by mules. After each rail car was loaded with 3 tons of ganister, they coasted down to a main track by gravity. Small steam locomotives, called dinkies, hooked up the rail cars to shuttle them to the Mount Union plant.

As the surface stone was depleted, switchbacks were used to elevate the cars on the mountainside. When the distance on the switchbacks became limiting, incline planes were constructed wherein a 2-inch steel cable connected two counterbalanced rail cars on two tracks; loaded cars going down the incline brought the empties up. At the top of the incline was a structure called a shive shed where the cable was wrapped in a figure-8 around two large steel drums. A friction brake activated by a windlass tightened wooden brake shoes against the steel drums to slow the ore cars descending the incline. The first incline ran from the Mount Union plant up to a bench at the edge of Jacks Narrows. The cars were realigned and sent up a second and third incline along the ridge line. Additional dinkey locomotives were utilized at the tops of each incline. On the Mapleton end of the narrows, quarry workers built an incline from the plant level track, later referred to as the Fire Trail, up to a bench above Mapleton. The top of the incline today is marked with three crosses. The ganister was quarried from the peak above Mapleton by no less than three refractory companies: H-W as described; Haws Fire Brick, which utilized a quarry with an incline down to the hill above Mapleton; and North American Refractories, which had a quarry and incline in Scrub Gap.

By 1917, the rock floes on the south side of Jacks Narrows were exhausted. H-W's last quarry near Mapleton closed. In anticipation of the need for more ganister, H-W began construction of a bridge across the Juniata River. It was a unique bridge with a curving northern end, crossing over the William Penn Highway and aligning itself with the mountain. An estimated one million tons of loose ganister lay on the north side of the Narrows. The same procedure was used by hand-loading rail cars and gravity feeding them to the dinkey. A ledge named Big Incline was built on the eastern end of the narrows as the quarrying moved higher on the mountain. When the floe stone was depleted on the adjacent levels, a second incline was built atop Big Incline and named Little Incline. At the top of Little Incline, quarrying curved around the mountain on its western side, using rail switchbacks to climb to the top of the mountain. This area was called Mill Creek Quarry because it faced the village of Mill Creek. Ganister quarried here was transported a great ways: down the switchback rails, around and into the narrows, down Little Incline, down Big Incline to the main line and finally shuttled across the Juniata River to the Mount Union plant.

At the plant-level rail on the Mount Union side of the Juniata River, quarry men extended the main line to the western end of Jacks Narrows, ending at an incline that ascended a ridge on the western flank of Jacks Mountain. Ganister was gathered from the ridge to Flush Run above Mill Creek. H-W workers named the area Mapleton Quarry because it faced the town of Mapleton. By the 1930s, the last of the floe stone was quarried in the Mapleton and Mill Creek Quarries.

During peak production, there were over 270 men working in H-W quarries. Each man had a 16-pound sledge for breaking rocks, a wire brush for removing dirt and rubber gloves since cloth gloves would not last. To break up the rock strata, ganister was often dynamited using a mud-capping technique. After dynamiting, workers broke the rocks into manageable sizes they could hand-load into the waiting rail cars. Workers chose the ganister to be loaded by color. The color

identified impurities such as high alumina and iron oxides. Only pure stone was placed in the cars, the rest discarded. The loaded cars were moved to the main track where they would be picked up by the dinkey. Each worker loaded three tons of ganister into each car, loading a total of six cars for a day's work. Every worker had a unique number stamped onto small brass tags, and after loading a car, he would attach his tag. The tagged cars were then shuttled to the Mount Union plant and weighed. Workers were paid by the ton.

Surface quarrying was less expensive than deep quarrying since it saved having to remove topsoil and blasting bedrock. The drawback of surface mining was that it was labor intensive. As labor costs increased, deep quarrying became more feasible.

In the late 1920s, H-W began replacing the steam driven dinkies with gasoline-powered engines. The two dinkies on the mountain were replaced first, then finally the two at plant level.

By the mid 1930s, the surface ganister was depleted on both sides of Jacks Narrows. On the eastern side of the Juniata River, H-W proceeded to open a large quarry at the top of the mountain. Known as the Ledge Quarry, it utilized the existing Big Incline and Little Incline to move the ganister down the mountain to the plant. The ganister at Ledge Quarry was still chosen and loaded into the rail cars by hand, but the cleanup of tailings was done by a diesel powered shovel that loaded side dumping rail cars. The tailings (waste rock) were dumped into the adjacent hollows.

In 1938, a stone shed was built below Ledge Quarry to house the gasoline dinkies and serve as a maintenance facility. The dinkey shed had a mechanic's pit and a crane that could remove the engines from the dinkies for servicing. Electrical service was extended up to the dinkey shed and Ledge Quarry. During World War II, several work shifts were scheduled to meet nationwide demand, using floodlights for night shifts.

Workers had a difficult commute to Ledge Quarry. A H-W safety rule prevented them from riding on the dinkey or rail cars, so to reach the work site workers had to climb Jacks Mountain daily, usually by climbing up Big and Little Inclines. The inclines were traveled mostly by employees from Mount Union and southeast of town. Employees from Mapleton used a worn foot trail directly up the hollow to the quarry, since the inclines were out of their way to travel.

<u>The Thousand Steps Arrive</u>

The 1936 Flood washed out the dinkey bridge at Mount Union, severing the rail line from Ledge Quarry to the plant. The bridge was never repaired. Instead, ganister was sent down the inclines and moved westward to a staging area at the eastern foot of Sand Plant Hill. Rail cars off-loaded to dump trucks which shuttled the ganister to the plant. The temporary routing created a bottleneck, so to help adjust the quarry's output the quarry superintendent at the time, John Shaffer, had workers construct a safer way to access Ledge Quarry. The foot trail used by Mapleton employees was improved using old dinkey traces connected by stone steps. The project was not completed all at once, but done in stages commensurate with available work in the quarry. This trail became known as *The Thousand Steps*.

In 1950, a new quarry was opened on the southeastern side of Jacks Mountain, behind the H-W Mount Union plant and aptly named *New Quarry*. A stone crusher was built at the bottom of New Quarry with a conveyor belt system. Ganister was loaded into trucks which moved the stone to the bottom of the quarry where it was crushed, then moved down to the plant on a conveyor belt. Two years after New Quarry was opened, Ledge Quarry was closed, equipment removed, tracks torn up and the area abandoned, ending all operations in Jacks Narrows and on the north side of the Juniata River. New Quarry met H-W needs until the Mount Union plant closed in 1986.

The Standing Stone Trail and the Thousand Steps

Evolution of the Standing Stone Trail

In 1974, the Standing Stone Garden Club hosted a speaker from State College, Dr. Thomas Thwaites, an avid trail builder and hiking advocate. Thwaites spoke about the Mid State Trail and his involvement in its creation. Since one of the best known hiking trails in America was the Appalachian Trail, one Garden Club member asked Thwaites if the Mid State Trail would hook to the Appalachian Trail. His answer was, "No," but the question stuck in the back of his mind.

During the 1970s, the Appalachian Trail in Pennsylvania was having severe difficulties. Land surrounding the trail corridor was not only being developed and subdivided, but posted against hiking. To alleviate this problem, various hiking groups discussed the possibility of moving the Appalachian Trail route onto a more western ridge. As a result, the Tuscarora Trail was created. Remembering his earlier Garden Club discussion, Thwaites conceived the idea of a trail to link the Tuscarora Trail with the Mid State Trail and thus connect it with the Appalachian Trail. He revealed his idea to the Keystone Trails Association (KTA), a state federation of hiking clubs. Along with a small committee of KTA members, Thwaites began plotting a potential route. Together they worked with state agencies and private landowners to receive permission to build this new trail, called the Link Trail. Ground work began in 1980 by flagging the route south from Greenwood Furnace State Park. The goal was to reach Cowans Gap State Park where the trail could connect to the Tuscarora Trail. By 1985, the Link Trail was complete, linking the two parks, a distance of 73 miles.

To negotiate Jacks Narrows, Link Trail planners needed a route to descend Jacks Mountain and cross over the Juniata River. Most of the land on the north side of Jacks Narrows was owned by H-W. Their Mount Union plant was still in operation, but their Jacks Narrows quarry had ceased operations in 1952. When the quarry closed, tracks, ties, and all equipment was removed leaving only the Thousand Steps and the old dinkey shed. Link Trail planners obtained permission from H-W to use the Thousand Steps and the old plant-level dinkey grade to cross their land. The Thousand Steps were badly deteriorated from the ravages of time. Whole sections of steps were missing, pushed down the mountain or covered over with quarry tailings. The Keystone Trails Association scheduled several work crews to repair the damage. Mike Sausser of Schuylkill Haven was appointed chairman of the Link Trail in 1993, and he divided the Link Trail into sections and proceeded to recruit maintenance volunteers for each section. Joe and Betty Clark of Mount Union volunteered to become section maintainers for the H-W property.

Acquiring the Thousand Steps Tract

In June of 1997, KTA and Link Trail volunteers were shocked when they learned Harbison-Walker was selling off their lands in Huntingdon County, including the 670-acre tract that was home to the Thousand Steps. An emergency meeting was scheduled in Camp Hill during a Governor's Greenway Conference. The meeting was attended by Link Trail advocates, the Keystone Trails Association and members of the Central Pennsylvania Conservancy (CPC). All parties agreed the only way to save the Link Trail was to purchase the tract. CPC took the lead, spearheaded by Carol Witzeman of Camp Hill. Witzeman organized a committee of local volunteers. The committee included Huntingdon's William and Pat Swigart, Steve Stroman and Lloyd Dell, while the Mount Union Historical Society was represented by Joyce Port and Elizabeth Goodman, plus section maintainers Joe and Betty Clark.

On August 5, 1997, the organizational meeting of the Save Our Steps (SOS) Committee met. To help raise $150,000 to purchase the tract, the SOS decided to "sell steps". Steps sold for $100 each, with certain unique step numbers selling for $500 and $1000. Public support for the purchase was outstanding. Many businesses, individuals and organizations purchased steps, some in memory of deceased family members who once worked in Mount Union's brick yards. Donations were given by many hiking clubs throughout Pennsylvania. Additional funds were obtained in 1998 through a Department of Conservation and Natural Resources (DCNR) grant. To improve and replace missing steps, several groups volunteered their time and labor, including KTA trail crews, Juniata College and the State Correctional Institution Community Work Program. The SOS committee successfully raised the necessary funds to purchase the tract from H-W, and on October 30, 1998, the property was transferred to the Central Pennsylvania Conservancy. The Conservancy had a policy of passing purchased land on to a management agency, rather than assuming long term ownership, thus the Pennsylvania Game Commission was chosen to manage the tract due to their mission of protecting wildlife species. The tract is now managed as part of State Game Lands Number 112.

Thousand Steps Today

The environment of the Thousand Steps tract is unique. Jacks Mountain comprises the deepest river-cut gorge in Pennsylvania. On the northern side the steep terrain slopes toward the Juniata River at an optimal angle to the winter sun, creating a micro-climate where reptiles, amphibians and other species thrive. The tract features an endangered fauna, the Allegheny wood rat, and an endangered flora, the thick-leaved meadow rue.

A non-profit Link Trail Club was formed in 2002 from the original Keystone Trails Association committee for the Link Trail. The club felt the name Link was diminutive in that it signified only a link between larger trails, so the name was changed to the Standing Stone Trail. The Standing Stone name better fit the history of the area and called attention to the stone monoliths found along its route. The club's name was changed to reflect the new trail name.

As part of State Game Lands number 112, all activities on the property are governed by game land rules and regulations. The Standing Stone Trail crosses the tract on a deed easement owned by the Keystone Trails Association. The Standing Stone Trail Club (SSTC), an all volunteer

organization with about 85 members, maintains the trails on the tract which include the Steps, a side trail to the top of Little Incline, the old stone dinkey shed and the entire Standing Stone Trail.

The Bigger Picture: The Great Eastern Trail

In recent years, working with the American Hiking Society and local trail clubs, the Great Eastern Trail Association (GET) is creating America's newest long distance hiking trail. This footpath is about 1,800 miles long and passes through nine states. Using a series of existing trails that are being linked to each other into a long-distance hiking trail — including both the Standing Stone and Mid State Trails — the GET stretches from Flagg Mountain in Alabama to the 950-mile Finger Lakes Trail in New York. Although the GET is not yet completely finished, long-distance hikers are coursing it in ever increasing numbers. In Pennsylvania, the GET bifurcates and allows hikers the option to hike on either the Standing Stone Trail or the Mid State Trail. For the hearty, these two trails, along with the Green Ridge and Tuscarora Trails in Maryland, provide a wonderful 300-mile backpacking loop.

The Standing Stone Trail Club

The backbone of the Standing Stone Trail Club is its section maintainers. The trail's 84 miles are separated into 33 sections which volunteers agree to keep maintained. These section maintainers keep their sections cleared of obstructions and brush, and assure the trail is safe and well blazed. A monthly trail work crew (affectionately called the Old Timers) is available on call for larger trail projects. A separate rock crew with roots in the Susquehanna Appalachian Trail Club has been conducting special rock alignment projects over the last several years. The Club makes power and hand tools available to all its volunteers. Winning Pennsylvania DCNR's Trail of the Year Award in 2016 is a testament to the hard work these volunteers have provided.

Volunteers are always needed. Those who enjoy working in the great outdoors are encouraged to simply join the club, adopt a section of trail, or join the Old Timers trail crew. More information is available on the SST Website: www.standingstonetrail.org.

The Future? Thousand Steps Needs Your Help

After the Thousand Steps tract was purchased in 1999, interest in hiking the area waned slightly until social media became popular, increasing the number of Step users considerably. Today the Thousand Steps receive more use than some state parks. On a nice weekend, the large parking lot on US 22 is completely full. Hikers, exercisers, hunters, tourists and just plain curious people create a steady stream of walkers visiting the mountain. Locals as well as people from other states visit the Thousand Steps regularly. When asked how they became aware of the Steps, the answer seems to be, "The Internet." In the early years, the intent of the hiking clubs that participated in the purchase of the Thousand Steps tract was to preserve a wilderness trail. Never in their wildest imaginations did they foresee the amount of activity the Steps would receive. With increased usage, there are also increased challenges.

The Challenges to Thousand Steps Longevity

Although the Thousand Steps tract appears to be rock solid, one must remember that it was a quarry in the past. The protective layers of Tuscarora sandstone were removed. The rock strata was dynamited and crushed into smaller rocks. These rocks and quarry tailings were dumped down the mountainside to clear the way for quarrying. The Thousand Steps were built over disturbed ground prone to erosion, and the live loads foot traffic induce gently vibrates the fragile underpinnings, especially when visitors stray off the trail. Many of the steps on the lower flights are made of soft shale and limestone that abrade faster than the harder quartzite. Nature too is a significant source of erosion, as torrential downpours can erode an enormous amount of soil and rock in just a few short minutes. Add to all of this porcupines and insects such as the woolly adelgid, emerald ash borers and gypsy moths stunt and even kill trees that hold the fragile earth in place.

Visitor Concerns

The vast majority of people visiting the Thousand Steps respect and enjoy the beauty of the area and make trail maintenance work worthwhile, and often even fun. However, some visitors are not respectful. Sadly, more than half the volunteer time spent on the Thousand Steps are spent on mitigating vandalism. Thoughtless individuals roll cribbing and border stones down the mountain, undoing hours of hand labor. Vandals blatantly discard water bottles and soft drink containers, cut trees, build fires and destroy signs. By far, graffiti is the most difficult to remedy since it must be removed using expensive chemicals and a lot of manual labor. If it were not for the volunteers who clean the graffiti, remove the fire rings, stop erosion and battle vandalism, the Thousand Steps would become an eroded, graffiti-covered eyesore.

The biggest challenge to the Thousand Steps is the paradigm for its future. Maintaining this vibrant historic feature during an era of decreasing volunteerism is a prominent concern. Presently the Standing Stone Trail Club is searching for section maintainers for the Thousand Steps, since the married couple who volunteered for the past 24 years have retired. In addition to addressing vandalism and erosion, the maintainer(s) must keep the trail cleared, analyze potential problems and seek support from designated Club work crews if needed. The Steps deserve — and this is an important word — commitment.

Will You Help?

If the Steps continue to attract large numbers of users, longer range plans must include rebuilding parts of the footpath. Such projects will depend on a dedicated individual or group of volunteers to provide the leadership for such improvements. It will take a lot of work and planning, but it will insure survival of the Thousand Steps as a Huntingdon County treasured landmark.

For information on how to become involved, contact the Standing Stone Trail Club (www.standingstonetrail.org) or contact our vice-president, George Conrad, by emailing him at: gconrad3.16652@gmail.com