0: A TREE FALLS IN A FOREST

In earlier years when the mills at Powder Hollow were young and fresh and new, men would answer when she beckoned, leaving their homelands behind and cross the roiling Atlantic to offer their skills and knowledge to make a fresh life with her.

Her attraction belied her danger, and even the best of men had lost their way, to the point of sacrificing their very lives when they had become too familiar, too comfortable, and had let down their guard.

Now, decades later, the bloom had left the rose, and years of neglect by Men of Means, who had abused her to simply enrich themselves, had stripped away her beauty and exposed her vulnerabilities.

She was old and tired and had become a pariah to all except the few men who attended to her.

Men whose livelihood, whose survival, depended on her.

How would she repay them?

The soft breeze rolled down the hill from a northerly direction, passing through the leafless trees that filled the wooded valley bordering the Scantic River. This wind made no sound, caressing each employee as they made their way

to their work stations, nature's breath lifting tiny granules of gunpowder from their clothing, even their hair, and transporting it to another location, perhaps atop a tin roofed building or upon the white snow that covered the ground around the Hercules Powder Site.

The snow, like a fine honeycombed blanket, lay across the hillsides, further muffling any opportunity for any sound to disturb the quiet comfort of the work in the hollow.

The sun did its best to try to warm the air, its light brilliantly reflecting off the seasonal white powder. But Old Man Winter had firmly settled into New England and the sun was no match for him, even though the days had begun to become incrementally longer as the December solstice had passed earlier that month, marking the start of the cold days of Winter, while conversely marking the march toward the warmer days of Spring in the new year of 1913.

A glance from one bank of the Scantic to the next revealed a sprinkling of chestnut trees, recently under assault from a blight that had begun to ravage them. Chestnut stumps as well, as the tree, valued for its beauty and yield, was equally valued by the townspeople for its use in heating homes for, as a 'sprouting hardwood', it would recover to regrow after being cut down.

Echoing the color of the season was the king of the forest, the white oak. Chosen as the state tree of Connecticut in 1947 to honor its place in history as the genus where the state's charter was hidden from the British in 1687, it salt and peppered the upper slopes of the ravine's hills.

More plentiful than the white oak, near the waters of the Scantic, was the red maple which thrived in the floodplains of the river, an area the white oak avoided. Less hardy, with a lifespan only half as long as the white oak yet more tolerant of the cold, the maple still held on to some of its leaves, perhaps the last in the forest to reluctantly surrender to the grey months that would follow.

Scattered amongst their brethren were white pine, yellow

birch and hemlock, as they shared an affinity for wetter areas along streams, rivers, and stagnant swamps.

Like silent soldiers the army of timbers formed a near impenetrable barrier around the manmade stone structures which dotted the landscape along the banks of the running waters, encircling the powder buildings like a second outer wall.

The high pitched chirp of the downy woodpecker intermittently pierced the afternoon quiet as they worked to extract wood borers attacking the compromised chestnuts.

Small flocks of black-capped chickadees, the most acrobatic, curious, and social birds of the Enfield woods, cast themselves about as they searched for berries, seeds, insects, spiders, and even fat and bits of meat from frozen carcasses.

All the while the rush of the Scantic River provided the constant thrum that tethered all other activities to the wooded valley. The waters had been recently fed upstream by a winter squall passing through Longmeadow Massachusetts, just 5 miles due north, adding to the volume of water coursing past the mills while filling the canals and over hurtling the dams.

Unlike other ventures, gunpowder manufacture was by necessity a quiet concern. The nature of the work required that there be no clanging or clashing of metal against metal or anything that might encourage friction to cause a spark.

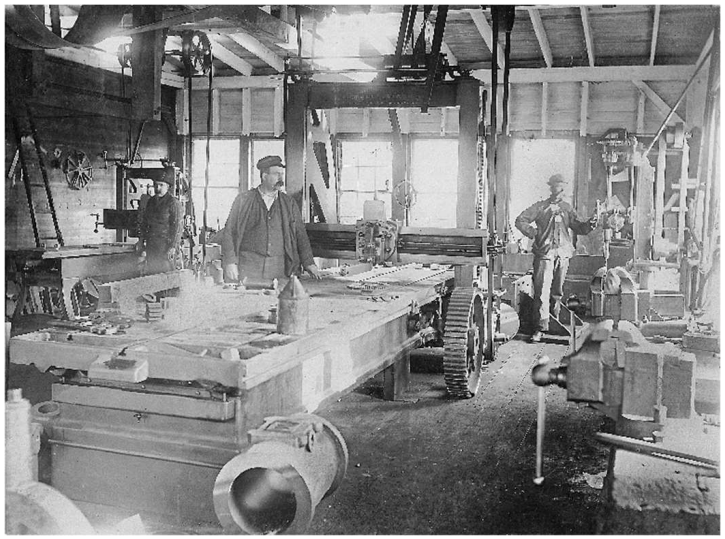
One could stand next to a mill and listen to the somnolent turning of the water wheel as the river passed over one of the three dams built to capture and control it. Flowing through the mill-race, the focused stream would hit the breastshot waterwheel, encouraging a slow yet powerful measured rotation of the wooden circle as it revolved on the greased bronze axle.

Although breastshot wheels were known to be less efficient than overshot and backshot wheels, they were better able to handle the steady, high-volume flows often

found on the fall line of the East Coast of North America. Fall lines like those that powered the Scantic.

The wheel's rotating shaft transferred a steady stream of power through a series of gun metal, more commonly referred to as red brass or bronze, gears to double iron wheels in Grinding Mills or sets of zinc rollers in Corning Mills. The process was subtle in sound; the near quiet reflecting the calm nature of the powder hollow harmonics.

Steam had been introduced to the site years earlier to provide power to the New Works during times of drought or when the freezing days of the deep winter months reduced the level and flow of the Scantic. But today the steam turbines were silent as nature had once again delivered and the river flowed with renewed volume.

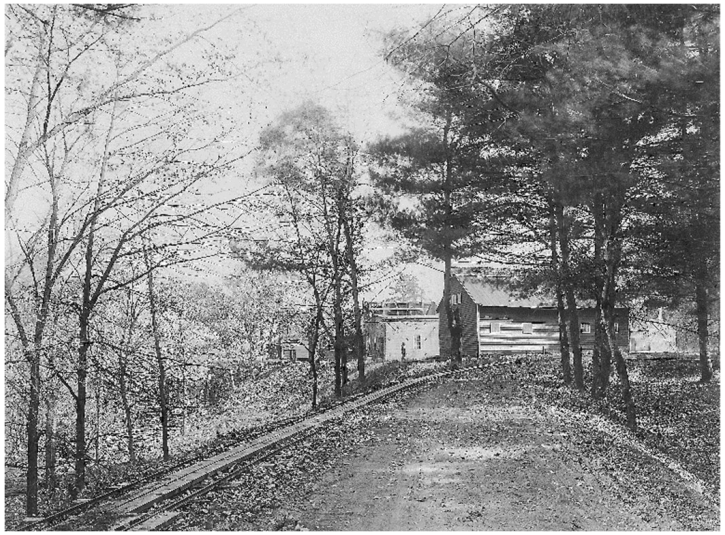


The Machine Shop where equipment was either repaired or new parts machined. Jacob Stocker, who lost his life in the 1913 blast, is pictured in the center, with Henry Rosenberger to the right.

The rubber booted feet of Jacob Stocker crunched new winter powder underfoot as he left the Watch House on his way back to the Lower Press Mill, passing the Upper Press.

His work clothes, into which he had changed at six a.m. that day in the Wash House when his shift started, were dusted with powder from previous untold weeks of labor. To the casual observer he would have looked like a shadow silently tracking across the site.

Charles Blunden had left the Double Wheel Mill on the north side of the Scantic not ten minutes before in a horse drawn wagon with about 500 pounds of damp mill cake loaded in the bed. He encouraged the mare, shod with brass shoes, to heel to his right as he passed the Glazing Mill, waving a quiet hello to Robert Miller and Fred Chevalier as the workers exited the doorway. Ghostly white warm breath escaped their mouths as they returned his greeting.



View of the New Works with the short rail to the left of the road where powder was transported between production buildings.

As the carriage crossed the bridge, built to connect the New Works on the Scantic's south side with the buildings on the north, Charles happened upon William Abel, powder foreman for the site who tapped his watch as if to encourage Charles to make haste toward the Press Mill. At 12:50 in the

afternoon there were orders to fill that day, and the press cake would still need to be rolled and glazed even after he and Stocker had completed their shifts at 2 o'clock. Charles, being a "rehire" at the site after having previously worked there years before, and wanting to make a good second impression, shook the reins lightly in deference to the foreman's directive.

As Charles pulled up to the Press Mill, Jacob was there to greet him to help unload the "green" cake into the building as they had done multiple times that day. The "green" mixture was still moist once it left the Mixing Mills, and it's explosive potential was reduced far below that of the "ripe" powder which would result after running the cake through the hydraulic press and giving it 48 hours to dry, so the men were less concerned with potential danger. In fact the last explosion at the Press House had occurred more than 60 years before.

Stocker had lived in the area for the previous 13 years, and was well acquainted with his fellow powdermen, as well as farmers in the region, as he filled both roles in life. Born in the village of Radlach in Kärnten (also called Carinthia), Austria, he had grown up to join the police force there. He had served for seven years as a member of the force before emigrating to America.

He had taken a wife, Emma Frere, three years after settling in the area, and the couple had three young girls Hortense, nine years old, Emma, 7, and Louisa all of 6. The family, by all accounts, was quite happy living on a quaint little farm two miles from the center of Hazardville on the road to Scitico.

Jacob Stocker was a large man, as his surname might infer, possibly due to his years in law enforcement or the rigors of farm work. In any event Blunden was happy to be working with a man who had familiarity with the equipment

and also had the required strength to help him load the cake onto the press as well as remove it from the forms once the pressure was released from the slabs.

Blunden himself, although just recently hired on at the site, was known as a powder expert, having worked at the site years earlier when it was called Hazard Powder. The mills were now known as Hercules Powder due to a name change in late 1912, a change mandated under the terms of a lawsuit brought against Dupont, Hazard, and other powdermakers who had been involved in a monopoly known as the "Powder Trust".

When the Enfield operation had shut down for a period in 1904 he had moved with his family to New Jersey to work at a DuPont mill located there. Upon his return he was welcomed back with open arms, as he had many friends in the area, and at the time Supervisor Prickett was happy to sign on an experienced powderman, even thought they were running below capacity due to the fact that they didn't have the required equipment to produce "smokeless powder".

By the time 1:26 had marked, the bell rang to alert the men the correct pressure had been reached and maintained, and it was time to unload the set of six forms from the press.

With enough time, if they pushed a little, they could load and complete one more set before finishing their shift at 2:00 that day.

Jacob and Charles had been working since six a.m. that morning, filling and removing molds from the press blocks. Mill cake, nestled between gun-metal plates, were compressed to one half of their original height, then the pressure released, which allowed the forms to be removed and the press cake extracted.

Assuring uniformity in the pressing of powder is at times an elusive goal, if not an art, as differences in density can affect the quality and explosive nature of the resulting

gunpowder. In this regard it was beneficial that Stocker was familiar with the eccentricities of the press, as money for upkeep had been withheld for repairs for years by the Dupont ownership, and the knowledge of the pressman in making adjustments on-the-fly to the equipment was invaluable.

1:27

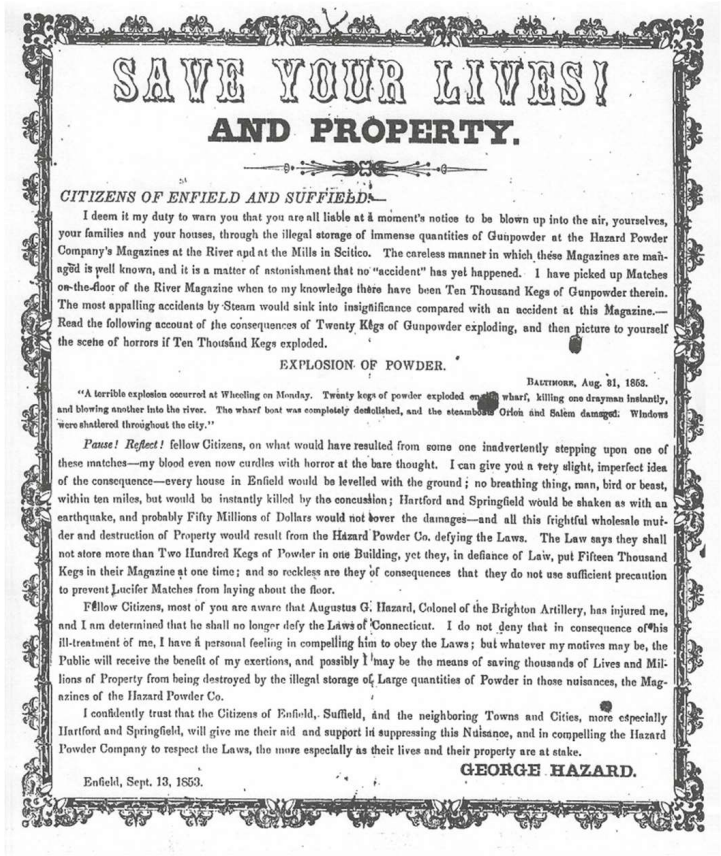
Charles visually checked the condition of the powder, now near slate hardness. He'd always personally measured the powder to ensure compression was complete, relying on his years of experience rather than simple cold mechanics. After all making gunpowder was as much art as it was science. Satisfied he motioned to Jacob to turn the screws to relieve the pressure from the stack.

In England, powder mills operated under restrictions defined by the 1860 Gunpowder Act. As part of those regulations the quantity of gunpowder that could be subjected to pressure in a Press Mill at one time was 1000 pounds, and not more than twice that amount was allowed in the building where the operation was being carried on. The intent was to prevent widespread destruction should a press detonate, as powder explosions which occur under extreme pressure are the most violent and destructive by their nature.

The regulations also set requirements for both the manufacturing and the storage of gunpowder, yet for all of the laws carrots, they sorely lacked the enforcement stick. This was clear when only four years after the law's passage a massive explosion of two gunpowder magazines owned by John Hall & Sons, located on the river Thames between the villages of Woolrich and Erith, resulted in a loss of lives and destruction of property within a ten mile radius.

There were no such laws in America in 1913, only rulings

concerning the storage of gunpowder near populated areas which could be defined as a "public nuisance".



SAVE YOUR LIVES!

AND PROPERTY.

CITIZENS OF ENFIELD AND SUFFIELD:—

I deem it my duty to warn you that you are all liable at a moment's notice to be blown up into the air, yourselves, your families and your houses, through the illegal storage of immense quantities of Gunpowder at the Hazard Powder Company's Magazines at the River and at the Mills in Scitico. The careless manner in which these Magazines are managed is well known, and it is a matter of astonishment that no "accident" has yet happened. I have picked up Matches on the floor of the River Magazine when to my knowledge there have been Ten Thousand Kegs of Gunpowder therein. The most appalling accidents by Steam would sink into insignificance compared with an accident at this Magazine.—Read the following account of the consequences of Twenty Kegs of Gunpowder exploding, and then picture to yourself the scene of horrors if Ten Thousand Kegs exploded.

EXPLOSION OF POWDER.

BALTIMORE, Aug. 21, 1853.

"A terrible explosion occurred at Wheeling on Monday. Twenty kegs of powder exploded on the wharf, killing one drayman instantly, and blowing another into the river. The wharf boat was completely demolished, and the steamboats Orion and Salem damaged. Windows were shattered throughout the city."

Pause! Reflect! fellow Citizens, on what would have resulted from some one inadvertently stepping upon one of these matches—my blood even now curdles with horror at the bare thought. I can give you a very slight, imperfect idea of the consequence—every house in Enfield would be levelled with the ground; no breathing thing, man, bird or beast, within ten miles, but would be instantly killed by the concussion; Hartford and Springfield would be shaken as with an earthquake, and probably Fifty Millions of Dollars would not cover the damages—and all this frightful wholesale murder and destruction of Property would result from the Hazard Powder Co. defying the Laws. The Law says they shall not store more than Two Hundred Kegs of Powder in one Building, yet they, in defiance of Law, put Fifteen Thousand Kegs in their Magazine at one time; and so reckless are they of consequences that they do not use sufficient precaution to prevent Lucifer Matches from laying about the floor.

Fellow Citizens, most of you are aware that Augustus G. Hazard, Colonel of the Brighton Artillery, has injured me, and I am determined that he shall no longer defy the Laws of Connecticut. I do not deny that in consequence of his ill-treatment of me, I have a personal feeling in compelling him to obey the Laws; but whatever my motives may be, the Public will receive the benefit of my exertions, and possibly I may be the means of saving thousands of Lives and Millions of Property from being destroyed by the illegal storage of Large quantities of Powder in those nuisances, the Magazines of the Hazard Powder Co.

I confidently trust that the Citizens of Enfield, Suffield, and the neighboring Towns and Cities, more especially Hartford and Springfield, will give me their aid and support in suppressing this Nuisance, and in compelling the Hazard Powder Company to respect the Laws, the more especially as their lives and their property are at stake.

GEORGE HAZARD.

Enfield, Sept. 13, 1853.

A broadside published by George Hazard, nephew of Augustus, alerting the townspeople to the potential horrors that should powder magazines explode.

Years before, in 1853, Augustus Hazard's own nephew had warned the citizens of Enfield and Suffield about the immense amounts of gunpowder being stored along the Scantic River and in Scitico in defiance of Connecticut's nuisance laws.

That day in the Press House at Hercules Powder, at least 1500 pounds of gunpowder, in pressed and green form, lay within the confines of the structure.

Could there have been more than one ton present at the time in pressed cake form? Two tons? Some uncounted slabs of finished cake still drying, awaiting transfer via the Angel Buggy to the Graining Mill?

The true tonnage may never be known.

1:28.

The pressure gauge responded to the screw rotation and the forms began to relax. Charles moved into position to remove the pins from the press box.

As would happen from time to time, whether due to uneven hydraulic pressure or a difference in the humidity of the mill cake when packed into the forms, a plate would refuse to liberate it's press cake, the powder almost rock hard and fused to the metal plate.

1:29.

Jacob passed the wooden 5 pound mallet to Charles, who tapped the edge of the gun metal plate to encourage the pressed powder to release.

One tap.
Then another.

Fractoluminescence is a phenomenon where light is generated through the breaking of a material's bonds when it is pulled apart, crushed, or snapped. When the material fractures a charged separation occurs, making one side of the fracture positively charged and the other side negatively charged. If the separation results in a large kinetic potential, an electric discharge across the gap occurs.

A spark.

1:30.

A soft tic signaled the separation of the gunpowder from the confining form as it snapped and released from the bronze plate.

A faint glow followed, barely perceptible in the near dark room, yet bright enough to highlight the look of horror on Charles Blunden's face.

Fractoluminescence.

In the year 1685 the Bishop of Cloyne, an Anglo-Irish philosopher, advanced the theory of "subjective idealism" which states that familiar objects, like tables and chairs, are only ideas in the minds, and as such do not exist until perceived or noticed or otherwise gain our attention.

Perhaps though he is best remembered for one quote that has withstood the test of time, even as his less-known theory enjoys a newfound home in quantum physics.

"If a tree falls in a forest and no one is around to hear it, does it make a sound?"

This day, at 1:30 on a cold, quiet afternoon in January 1913, the Bishop's theory would be tested.

A tree was about to fall in the forest.

Perhaps more than one.

Would they make a sound?