

WASC 2352

Essay by

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[from Book of  
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## Essay by John Ludlum

It is 1939. War has just been declared. Ron Treadgold is cycling to work with his mates. They are just a few months out of school, cycling four abreast over Chingford Mount, along roads as quiet as the grave.

The youths work at the Royal Gunpowder Factory in Waltham Abbey, north of London. Ron is a lab assistant. He will not join the forces but will instead serve his country another way, helping to forge the deadly explosives with which Britain is waging war.

“You knew you were getting near the powder mills,” he recalls. “Because, as you got to Quinton Hill, the wind carried all the fumes from the acid factory across the road. It was really strong. It would sting your face and the chromium plate on the handlebars used to get quite pitted. People living in Waltham Abbey got extra clothing ration coupons because their curtains - which had to be bought with clothing coupons - used to fall to pieces. The curtains just rotted away with the acid fumes blowing across from the works.”

In 1939, the Royal Gunpowder Factory at Waltham Abbey was more than two and a half centuries old. Its mills had ground gunpowder for Wellington and Nelson. Its acid factories and guncotton nitrators had spewed out mountains of cordite during the Great War. spewed out mountains of cordite during the

Great War. Now, Britain's belated dash to rearm during the late 1930s had given back the mills their sense of dread purpose. Ron was joining a long line of men and women whose skills and determination had kept the Royal Gunpowder Factory at the forefront of explosives development and manufacture.

Gunpowder came to Waltham Abbey around 1664. Mixing gunpowder at that time was a tricky, inexact business. At its crudest, the process was merely the combination - by hand with a pestle and mortar - of saltpetre (potassium nitrate), charcoal and sulphur. Waltham Abbey lay on the banks of the River Lea. Water power could drive mills that crushed and incorporated the ingredients more efficiently. The Lea offered a navigable route to the Thames and London. Alder trees could be coppiced onsite to yield charcoal. Nearly three centuries of gunpowder production at Waltham Abbey began.

The enterprise stayed in private hands until 1787, when it was bought for the Crown from the Walton family, for £10,000. The man who urged the British government to buy the mills was William Congreve, the deputy comptroller of the Royal Laboratory at Woolwich. Britain's military adventures during the Seven Years War (1756-1763) and the American War of Independence (1775-1783) had exposed the rottenness of its gunpowder. Congreve, a man of vigour and vision, set about transforming the industry. Congreve refitted The Royal Gunpowder Factory, as it then became known, and, by the end of the century, British gunpowder was the best in the world.

Waltham Abbey stayed at the cutting edge of its dark industry throughout the nineteenth century.

Gunpowder production became increasingly more sophisticated. Water power gave way to steam power. But, still, gunpowder was a bulky amalgam. Artillery weapons were getting bigger and bigger: more and more gunpowder was needed to fire just one round from these giant guns. New, more compact explosives had to be found.

The answer came from the chemists. First, in 1846, was guncotton, a volatile combination of cellulose (in this case, cotton) and strong nitric acid. In 1847, chemists developed nitroglycerine, an even more volatile explosive compound marrying nitric acid with glycerine. Though potent, these explosives were difficult and dangerous to handle. But, in 1889, cordite, a new compound that combined guncotton, nitroglycerine and a stabilising mineral jelly, was patented. Cordite was relatively stable and, compared to earlier explosives, smokeless. A soldier could see what he was aiming at. The British military establishment rushed to adopt cordite as its principal ordnance propellant and the Royal Gunpowder Factory had found its next staple product.

Guncotton and nitroglycerine were manufactured onsite at Waltham Abbey and the two explosives were then combined to make cordite. Once mixed with the mineral jelly, the cordite became a workable paste that could be extruded into long strips (or cords) of varying

thicknesses and cross-sections to suit different weapons.

The government needed cordite in vast quantities during the Great War: in August 1914, when war was declared, the government placed orders for 16,000 tons of cordite. Waltham Abbey had been supplying one-third of the pre-war annual order of 3,600 tons and the plant was expected to pull its weight accordingly with its wartime output. Thousands of new hands were hired as the mills reached their grim zenith. By 1918, as Europe tottered towards Armistice, 6,230 souls were labouring at the Royal Gunpowder Factory. Of these, 3,108 were women, or “Munitionettes”, pumping out the cordite that propelled millions of shells across the frontlines.

British staff officers were telling their infantrymen that artillery would be their “best friend” in the trenches. But, in times of war, everyone’s best friend is someone else’s worst enemy. The Germans had their best friend, too, and its destructive potential was truly terrifying:

“Our greatest trial was the canister. It was a two-gallon drum with a cylinder inside containing about two pounds of an explosive called ammonal that looked like salmon paste, smelt like marzipan, and when it went off sounded like the day of judgement. The hollow around the cylinder was filled with scrap metal apparently collected by the French villagers behind the German line - rusty nails, fragments of British and French shells, spent bullets and the screws, nuts and

bolts that heavy lorries leave behind on the road. We marched in squads to the canteens, with the dissected one canister that had not exploded and found in it, among other things, the cog-wheels of a clock and half a set of false teeth.”

*Robert Graves, from his autobiography, Goodbye To All That.*

For Graves and the millions of other soldiers stooped in their trenches beneath a sky hot with death, the finer points of a chemistry that had brought the world to the very point of annihilation must have seemed distant. But they were fighting in what has been called a “chemists’ war”, a war in which the chemists of Waltham Abbey played a significant part.

The fumbling peace of Versailles cast a long shadow over the Royal Gunpowder Factory. It escaped decommissioning but operated at a far reduced level in the inter-war years, until the calls to rearm became too strident to ignore.

In 1938, Norman “Bob” Elliott was a millwright, working in the machine shop at the Royal Gunpowder Factory. “You never heard anyone speak of the coming war. It was just that everyone got busier and busier,” he recalls.

Britain was racing to stockpile munitions, stung into action at last by the threat of Germany’s mighty war-machine. Bob was working flat-out, recreating precision dies to extrude cordite, copying Great War

drawings from scratch: the dies themselves had long been lost, scrapped, perhaps, in the misguided notion that the peace negotiated at Versailles rendered such tools unnecessary for ever more. “It was the highest class work done in the whole of the factory,” Bob declares.

Many of the workers at the Royal Gunpowder Factory were “Reserved Occupation” - exempt from military service because of their valuable skills, qualifications or trades. Others had been refused entry to the forces on health grounds. They may have remained civilians but their working lives were as regulated as any soldier’s.

Workers were not allowed to roam around the site. You kept to the paths you were told to, and did your work in the sector you were assigned to.

Sis Ward worked as a cordite blender during World War Two, making sure that the boxes of cordite for onward delivery were all composed of different production batches. She remembers her service at the mills as a highly regulated activity.

“If you were ever taken ill, you were never allowed to walk to the rest room or the hospital on your own. Three of you had to go up, so two could come back - because you were never allowed to walk in the grounds on your own.”

At mealtimes, Sis and her female colleagues were chargehand in front and the overseer bringing up the

rear. “You were very restricted. You weren’t allowed to go in any other buildings,” she says.

An authoritarian regime wasn’t the only similarity to military life. Working in any munitions facility was a dangerous business. Ever since the mills began making gunpowder, there had been explosions. Around 200 people had died over the years as press houses, corning houses, blending houses and incorporating mills had gone up.

There were many safety measures in place at the Royal Gunpowder Factory. Buildings were widely spaced, so that a blast in one building could not set off its neighbour. The plants were protected by huge mounds of earth and concrete, called traverses, which were meant to deflect explosions. The buildings themselves often had deliberately flimsy roofs or walls so that the force of an explosion would be dissipated with less material damage. Workers wore special clothing, without metal buckles or buttons, and their shoes were unshod: anything that might set off a spark was strictly forbidden on the site. Of course, smoking was out of the question and workers were searched at the gate for cigarettes, matches or other “contraband” items.

Despite all these measures, there were still accidents. In 1940, two separate explosions killed 10 men and interrupted cordite production. Bob Elliott witnessed one of these blasts, from his machine shop, as four cordite drying stoves and a mixing house exploded, with devastating effect.

“There was five explosions. The machine shop roof left the brickwork five times. As we stood and watched, with all the dust coming down, a cast iron girder in the machine shop broke clean in half and hung down 12 foot from the ground. We saw debris flying through the air. You could see all the stuff falling. It was falling for a good minute before it settled. Then the dust reached us. You couldn’t see across the other side of the room. We were all choking. We knew people must have been killed but we weren’t allowed to leave the shop.”

The acid factory was an unpleasant and hazardous place to work. Ron describes it as a “Devil’s Kitchen - there were fumes and furnaces all over the place.” Bizarrely, dotted around the acid factory were domestic baths full of water. The idea was that, if a man suffered acid burns from a spillage, he would plunge himself into one of these baths, to relieve the burning.

Sadly, this rudimentary treatment was often insufficient to save lives or prevent the awful mangling of human flesh acid can effect. Arthur Wilson, a worktaker at the Gunpowder Factory, recalls an accident in which a chargehand called Palmer was horribly burned when a cast iron vessel used to distil nitric acid cracked and highly toxic by-products spilled onto a fire, causing an explosion. At least one man died in the incident. Months later, Arthur spotted a figure seated on a bench in Waltham Abbey, near the churchyard.

“Even as I got closer I couldn’t recognise who it was because the face was so shockingly disfigured by burns. The only person that I knew of who had suffered such a fate was Palmer, so, with some trepidation, I took a chance and addressed the person as if it was him. I need not have worried. He made it easy for me. He was so pleased I had spoken. He was so keen to talk about his injuries and for me to see the progress he was making both physically and mentally. No words of complaint. He was wearing knitted woollen gloves, gauntlet in style, and they did not have separate fingers. He told me that in the accident his fingers had fused together and that attempts had been made to separate them. Taking his gloves off, he held up his hands and proudly showed me how some movement was coming back into those pitifully poor skin over bone appendages. What could have been somewhat harrowing turned out to be one of those most uplifting occasions that happen all too rarely in a lifetime ... I’m still glad I stopped and spoke.”

After the war, the Waltham Abbey site became a research establishment. Deep among the alders, far behind the perimeter fences, scientists tinkered with solid propellants destined for the rockets and missiles pointing towards the Iron Curtain.

The Ministry of Defence finally closed the site in 1991. For years, decay had been eroding the establishment’s unused sectors. Now, as the scientists packed away their equipment and departed, nature began its assault in earnest.

A decade later, part of the site is now a museum charting the history of gunpowder and the other explosives manufactured at Waltham Abbey. But most of the site is still off-limits to the public, clinging to its secrets. Where once terrible acids boiled, crumbling brick foundations are smothered by brambles. An abandoned powder barge has settled into the soft earth, wild flowers peeping through its rotting deck.

In the remoter areas, a vicious order operates untrammelled: an obscure jumble of concrete and steel box rooms where men in white coats and safety glasses once tweaked knobs and flicked at dials is now a charnel-house where flies buzz among a fox’s stockpile of torn and bloody rabbit parts.

It’s all falling apart: windows are glassless maws, doors tip crazily, floors are ripped by eruptions of sour-smelling grasses. Ladders without rungs, stairs with no treads, wood flayed beyond redemption - decay is having its day in a way we rarely see in this country any more.

So what are the secrets the mills still hold on to? Ron says he hears voices of old comrades when he visits the site. In the end, all that government secrecy, the MOD files, the wartime regulations, the Cold War paranoia, are nothing compared to the countless secrets of individual lives, all touched by the Royal Gunpowder Factory, all somehow locked into the disintegrating fabric of its disappearing buildings.

They are there, drifting among the alders.