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Objects(s): Box - Explosives.
Object Number(s): STMEA:1997-22
Researcher details: Richard Hall, Volunteer

Box-Explosives

This object from our collection recalls something of Stowmarket's industrial past.

It is a wooden box, belonging to the New Explosives Company of London and Stowmarket (Figure 1), from which it can be dated with reasonable accuracy to between 1885 and 1920, when the New Explosives Company was trading in the town.

The box is of a sturdy construction, being of toungued and grooved timber with added strengthening bars. The lid of the box was held in place with ten screws. Given the security of the box, its most likely contents would have been a product known as, 'Cord Powder' or by its more popular name; 'Cordite.'[1] Cordite, looks very much like strings of spaghetti (although you certainly wouldn't want to eat it!) and was used as a propellant for bullets and shells required by the military during both the First and Second World War.

Figure 1: Box-explosives - Museum of East Anglian Life[2]

[1] Cordite | propellant [Internet]. Encyclopedia Britannica. 2021 [cited 15 January 2021]. Available from: https://www.britannica.com/technology/cordite

[2] Figure 1 - Museum of East Anglian Life, Stowmarket. Box-explosives (STMEA:1997-22)[cited 18 January 2021]. Available from: http://eastanglianlife.org.uk/wp-content/uploads/2017/09/Explosion-Powerpoint.pdf (CC-BY-NC)

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Photographic evidence exists in books by Harry Double[3], showing boxes of cordite waiting to be loaded onto a railway wagon at the New Explosives Company in Stowmarket.

The manufacture of Cordite

The smokeless propellant, cordite, was invented in 1884 by French chemist, Paul Marie Eugène Vieille[4]. His propellant was made from nitrocellulose (also known as 'guncotton') dissolved in ethanol (pure alcohol) and ether (used as a medical anaesthetic). As you might imagine, the factories used to make cordite were both dangerous to work in and resulted in a very dirty, chemical laden process, long before the days of rigorous Health and Safety measures were enforced.

In Britain, Professor Sir Frederick Abel[5], worked with Sir James Dewar and Mr Keller, to develop Vielle's formula and took out two UK Patents on it. Professor Sir Fredrick Abel, is important to the development of the explosives industry in Stowmarket, as we shall see later.

At the beginning of the first world war, the government realised that it needed to step up its production of propellant for its bullets and shells. Production, which over time was to become a huge industry, employing thousands of people in the manufacture of munitions including the production of empty brass shells and bullets, as well as cordite propellants (Figure 2). As men were being enlisted into the army, many of these employees were young women. Many factories too, turned their production over to filling empty munitions. This production was essential to the war effort and the government established a ministerial post with responsibility for it in 1915[6].

[3] Double H. Stowmarket - A Pageant in Pictures. 1st ed. Stowmarket.{Plate 24]. Capella Publications; 1982.
[4] Paul Marie Eugène Vieille [Internet]. En.wikipedia.org. 2021 [cited 15 January 2021]. Available from: https://en.wikipedia.org/wiki/Paul_Marie_Eug%C3%A8ne_Vieille
[5] Frederick Abel [Internet]. En.wikipedia.org. 2021 [cited 15 January 2021]. Available from: https://en.wikipedia.org/wiki/Frederick_Abel
[6] Munitions of War Act 1915 [Internet]. 2021 [cited 15 January 2021]. Available from: https://www.parliament.uk/about/living-heritage/transformingsociety/parliament-and-the-first-world-war/legislation-and-acts-of-war/kdjgh/

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Figure 2. Forest H Barfield. Close-up of cordite filaments in a .303 British Rifle cartridge (manufactured in 1964).[7]

So successful were the co-ordinated efforts across the country that Britain's production of munitions rose from 5,000 tons in 1914 to a staggering 185,000 tons in 1917; a 3,600% increase![8] Such figures make it clear that capacity was needed in several factories across the country. At the beginning of the First World War, the government relied on its own factory; 'The Royal Gunpowder Factory' at Waltham Abbey in Essex[9]. However, greater capacity was necessary and the government also used several private firms across the country, such as the New Explosives Company, as well as building one of its own before the war ended.

Stowmarket's 'Explosive' History

Robert Malster[10] offers a well-researched and comprehensive history of the manufacture of explosives in Stowmarket which is corroborated by Double[11] and several local historians, and I shall rely heavily on this in the following material. It links the original business firmly with Prentice family, leading architects of the town's industrial past. The family owned or were connected in some way to several businesses in the town. Many of the larger houses including Abbots Hall and Red Gables (built on Abbots Hall land), were at one time homes to members of the Prentice Family.

Malster writes that "the first factory at Stowmarket for the manufacture of guncotton, to a design by Professor Abel, was built in the early 1860's."[12] Guncotton, was a simple yarn, dipped in a mixture of

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[7] Figure 2 - Barfield F. Close-up of cordite filaments in a .303 British Rifle cartridge (manufactured in 1964). [Internet]. 2021 [cited 18 January 2021]. Available from: By Forrest H. Barfield - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=33592649

[8] How Germany lost the WWI arms race [Internet]. BBC News. 2021 [cited 15 January 2021]. Available from: https://www.bbc.co.uk/news/magazine-17011607

[9] First World War: Explosives Factories | Historic England [Internet]. Historicengland.org.uk. 2021 [cited 15 January 2021]. Available from: https://historicengland.org.uk/research/current/discover-and-understand/military/the-first-world-war/first-world-war-home-front/what-we-already-know/land/explosives-factories/

[10] Malster R. Britain in old photographs - Stowmarket. 1st ed. Stroud: [Pages: 53-66]. Alan Sutton; 1995.

[11] Double H. Stowmarket - A Pageant in Pictures. 1st ed. Stowmarket.. Capella Publications; 1982.

[12] Malster R. Britain in old photographs - Stowmarket. 1st ed. Stroud: [Pages: 53-66]. Alan Sutton; 1995.

nitric acids, after which the soaked cotton was rinsed through with water and left. Malster believes that water from the River Gipping was extracted for this purpose before being returned to the river. If true, we can imagine that the river Gipping, at that time, would have been seriously polluted.

In 1864, in a foretaste of the hazards of explosive production, two female employees were killed in a small explosion at the factory. By 1870, the factory had received a government licence to produce explosives using a new method of production, patented by Abel and his associates and the company became known as the 'Patent Safety Gun Cotton Co Ltd.' The word 'Safety' in the company's name was to prove problematic, when on Friday 11th August 1871, the factory and surrounding area was totally decimated by three explosions, the effects of which, were felt several miles away (Figure 3). The Bury and Norwich Post[13] gave a vivid account of the government inquest, held in Stowmarket, following the incident which killed 23 people, some as young as 12, and injured a further 70. The inquest however, failed to reach any firm conclusions as to the causes of the explosions, beyond suggesting the cause was "a person or persons unknown, adding sulphuric acid to the guncotton after it had passed government tests." In our collection we hold several objects and photographs from the Gun Cotton Factory which serve to illustrate the work of the factory as well as the devastation caused by the explosions (See also: **STMEA:2008-173** and **STMEA:2008-174**).

Figure 3: Aftermath of the Gun Cotton Explosion. Museum of East Anglian Life[14]

[13] Bury and Norwich Post. 12th September 1871; British Newspaper Archive [Internet]. Britishnewspaperarchive.co.uk. 2021 [cited 18 January 2021]. Available from: https://www.britishnewspaperarchive.co.uk/viewer/bl/0000156/18710912/060/0009

[14] Figure 3 - Museum of East Anglian Life, Stowmarket. Aftermath of the Gun Cotton Explosion (STMEA:2010-249)[cited 18 January 2021]. Available from: http://eastanglianlife.org.uk/wp-content/uploads/2017/09/Explosion-Powerpoint.pdf (CC-BY-NC)

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Two members of the Prentice family died in the explosion. Edward Prentice, a Director of the firm and his Nephew William, who had just arrived home from University in Heidelberg. An appeal raised £3,472, almost a third of which provided immediate relief to the sufferers. Manning Prentice paid a further £1,500 to Trustees to reimburse those who had suffered damage.

Work to rebuild the factory began by the end of the year and the word 'Safety' was expunged from the company's name. The Prentice family, having suffered such a grievous and personal loss, sold the company in 1860.[15] By 1881, it changed its name to 'The Explosives Co Ltd' and in 1885, finally became known as 'The New Explosives Co Ltd'.

The New Explosives company produced a range of products including blasting charges for quarrying and military explosives. Cordite production began in 1898, sending much of its output down river by barge, setting off from the companies own locks which were diverted from the river Gipping for the purpose. As the river became silted up, the company invested in sidings from the nearby, Norwich to London railway line to transport their products. Double's[16] book, Stowmarket a Pageant in Pictures, contains a plate showing trains being loaded at the sidings during the First World War.

During the First World War, the output of guncotton was significantly increased, at one point the company were employing upwards of 2,000 people on day and night shifts. Many workers, were brought to the factory by specially chartered trains from Bury St Edmunds and Ipswich. It also meant Stowmarket, was increasingly a target for Zeppelin Air Raids. Castle, [17] records a raid on 23rd September 1916, targeting the explosives factory, which at the time was protected by two 3-inch artillery guns. Bombs fell on Needham Market, Badley Bridge, Creeting and Stowupland but "missed the factory with no bombs landing closer than 1,600, yards away".

As the war progressed, Malster says that the factory began production of 'Dopes' for aircraft manufacture. Dope was used to shrink fabric onto the wooden frame of the aircraft, making a tight seal and aerodynamic shape to the fuselage and wings. The use of nitrites to manufacture dope, were also somewhat counterproductive, being of course, highly flammable material!

Nevertheless, dope production was really a foretaste of the company's future and at the end of the war, the name was again changed to 'Necol Industrial Collodions Ltd.' Its main products were cellulose coatings for car and furniture making. In the 1920's the company became 'Nobel Chemical Finishes Ltd' leading to its incorporation as part of the ICI group, now Akzo Nobel who still supply paints and finishing material operate from the site.

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[15] ICI Paints Division, Stowmarket | The National Archives [Internet]. Discovery.nationalarchives.gov.uk. 2021 [cited 18 January 2021]. Available from: http://discovery.nationalarchives.gov.uk/details/r/00bad737-b187-4f01-8c63-e540754af59c?fbclid=IwAR2vxsM2dUajQtUhtrQdoPS6iTjeNiYTjWqUTIe3b74ZbJADkkx4MFp-HfQ

[16] Double H. Stowmarket - A Pageant in Pictures. 1st ed. Stowmarket.[Plate 24]. Capella Publications; 1982.

[17] Castle I. Britain's first blitz - 1914-1918 [Internet]. Zeppelin raids, Gothers and 'Giants'. 2021 [cited 18 January 2021]. Available from: http://www.iancastlezeppelin.co.uk/2324-sep-1916-1/4592768011