

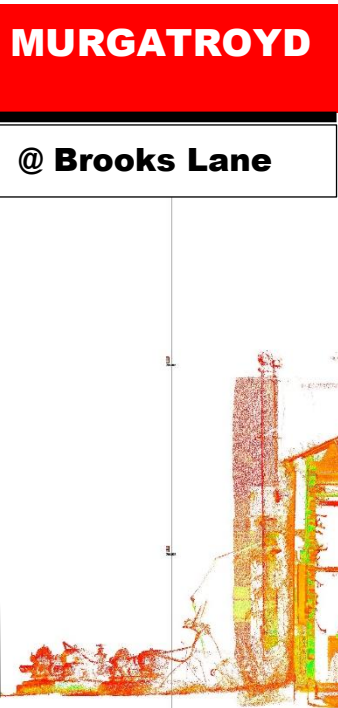
A Tale of Two Georges

George Lomas Murgatroyd (1850-1894)

George Lomas Murgatroyd was born on 11th July 1850. His father Joshua Murgatroyd entered partnership with J.T. Emerson in 1858 creating Emerson and Murgatroyd Co Ltd, Millwrights and iron founders, Stockport. The company was involved in important engineering works in England and on the continent. In 1875 Emerson and Murgatroyd's, became contractors to the Weaver Navigation Trust for the construction of Anderton Boat Lift. However, around this time Joshua Murgatroyd died and George continued his work at Anderton.



In 1889 Abel Grundy, purchased Newton Farm, Middlewich, and adjacent plots of land between the canal & railway and between Brooks Lane & Cleford Lane. The land was in fact bought by George Murgatroyd. It may be that he was known by members of the newly formed Salt Union and he did not want to be associated with the purchase. In the same year, Murgatroyd began sinking a brine shaft and construction of salt works, the first salt lump was made on New Year's Eve. The formal transfer of Newton Farm estate from Abel Grundy to George Lomas Murgatroyd, was made 15th January 1890.



MURGATROYD

@ Brooks Lane

A report dated 29th March 1890 from Ralph Oakes of Winstford to Murgatroyd, refers to the brine shaft "sunk by me which is 8 feet sq. in the upper section and 5 feet sq. below, well and strongly timbered and braced throughout its entire depth of 274 feet".

"This was the first discovery of rock salt beds under Middlewich."

With the first stage complete, the 30th July 1891 saw the incorporation of Murgatroyd's Ammonia Soda and Salt Syndicate. Construction of railway sidings began in July, followed by a tower building, chimneys and a brick making plant taking clay from the new canal basin. In April 1892, Murgatroyd agreed with Aman's Salt Co Ltd to supply brine by metered pipeline. Aman's had built the adjacent Salt Works, but their brine shaft had failed to discover rock salt.

During 1893-4, Murgatroyd continued the expansion, the Ammonia soda works produced the first soda ash on 17th January. Construction of a new laboratory and offices began, also a plant to manufacture pure sodium bicarbonate was commissioned.



In 1894, to control the market, Brunner Mond dropped the price for soda ash from about £7 per ton to £3 per ton. This placed a lot of stress on George at a time when expansion was at its height and he died from an overdose of belladonna.

Ivan Levinstein became director & chairman of the Murgatroyd Syndicate. In July 1895, an agreement was reached for Ludwig Mond to purchase the Ammonia Soda Works, while Ivan purchased the Salt Works.

George Daniel Twigg (1927-2016)



George was a chemist at BP Chemicals (Murgatroyd's) and an avid salt researcher and historian. He worked voluntarily with Lady Rochester and Brian Curzon to re-open the Salt Museum in the North in 1981. The previous salt museum originally opened by Thomas Ward & Sir John Brunner in 1887 had closed. George recognised that our salt history was vital in understanding our industrial heritage and landscape. "The deep well pumps at Middlewich are now the last of their line, we also have a unique combination of traditional type beam pumps, hand dug timber-lined shaft and original timber head gear. All this would seem worthy of preservation, if only as a holding operation in anticipation of more affluent times and not let evidence of the more recent salt making past disappear without trace." George Twigg

George's time at Murgatroyd's saw some dramatic changes in the industry, he wrote an early biography of Murgatroyd & history of the company. His interest and passion live on through this project, his last collaboration. We came across the overgrown site in 2008 and enlisted George's help one final time. Stage by stage we worked towards saving the building and preserving George's archive. He died before the project was finished and so never saw the restored site. We owe George a debt of gratitude that cannot be repaid.

Middlewich Heritage Trust's purpose is the preservation and promotion of the heritage of Middlewich (including buildings, artefacts, and archives) as a resource for the benefit of the residents of Cheshire East, of Cheshire West and Chester, and of the wider public.

It is the intention of Middlewich Heritage Trust, with assistance from Middlewich Town Council and other interested parties, to restore Murgatroyd's Brine Pumps and surrounding area as a heritage, tourism, and educational resource for the town. This project will be integrated with other related projects in the area to produce a comprehensive tourist salt route thereby contributing to the town's heritage, tourism, and planning strategies.

The Trust is also working in partnership with other Trusts and organisations within Cheshire to actively promote our shared Industrial and Social heritage.



"Sites associated with the salt industry are relatively rare with fewer than a dozen being currently designated nationally of which under five are of C19 and C20 date. Of these only two, The Lion Salt Works and Remains of Part of the Alliance Salt Works (1020841 & 1160985), and the Multi-period Salt Production Works in Droitwich (1020256) retain evidence for their brine pumps, pump houses or engine houses". English Heritage Advice Report 13 April 2012

Murgatroyd's Brine Works are scheduled for the following principal reasons: * Survival: the remains survive well and retain both upstanding structures and below ground archaeological deposits that together illustrate the development in the pumping and transferring of brine throughout the plant's lifetime * Rarity: the brine pumps, shaft, pump house, gantry, header tank, electrical pumps, power distribution transformer and power house are a very rare survival of a 'wild' brine pumping plant that retains most of the typical features of a late 19th/20th century installation. * Potential: this site clearly has the potential to enhance our understanding of the C19 & C20 salt extraction industry in general, and in particular, how this element of the industry was developed and improved during the period of brine work's lifetime. Pumping of brine at the site ceased in 1977 to eliminate "wild" brine pumping and was retained as the last remnant of salt making in Middlewich.

Murgatroyd's Brine Pumps are the last remaining part of Murgatroyd's Salt and Chemical Works (1889-2010). They have a story to tell of open pan salt making in Cheshire and the first developments of the new and emerging Chemical Industry. The pumps are the only complete and in-situ 'wild brine' pumps left in the UK with an original hand-dug timber-lined shaft dated 1889. The assets are housed in an early 20th century building on a piece of land that is of geological and geographical interest. Its national importance is acknowledged by the site's designation as a scheduled monument (SM 34588).



The brine pumps have considerable communal value. George Murgatroyd's discovery of rock salt and the brine stream brought employment and a renewal of the town's prosperity. The site was in poor condition, 'at risk' of losing historic fabric, and as essential as it is, this project is also about archival heritage.

Thanks to George Twigg, we also have his personal archive covering many aspects of salt manufacture both in this country and abroad. Containing over 3,000 documents, maps, drawings, photographs, oral interviews, film, and artefacts, the archive records industrial and social development in the salt industry from 19th to 21st Centuries. These are being digitised and published on-line, where they will make a significant contribution to the national archive into Britain's industrial past.

The brine from Murgatroyd's shaft was widely used in different forms and processes for many trades and products world-wide. Salt-makers preferred to use natural brine, and, with the invention of deep well pumps, they started to dig deep shafts in search of brine. Underground brine streams are unpredictable. The digging of shafts was a special art, few men during the nineteenth century became experts at digging and seeking out the brine run.

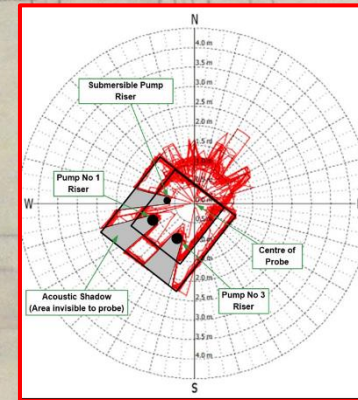


The next stage was to dig an 'adit' (horizontal tunnel) along the upper salt bed, after 25 yards, brine was finally discovered. An analysis of the brine was completed by Liebmann & Studer, Manchester. The results were sent in a letter dated April 15th, 1891. Brine contains: - 25.77% Sodium Chloride, 0.45% Calcium Sulphate and 0.18% Magnesium Chloride. 'These figures prove that your brine, as submitted for analysis, is fully saturated with salt'.

'The brine now standing in the shaft is ample for all possible requirements, it being, I believe practically inexhaustible' Ralph Oakes

The shaft work began in 1889, under contractor Ralph Oakes of Winsford and this was one of the last shafts to be dug in this way. Borehole technology was the new way forward. The first bed of rock salt through which the shaft passes is 50ft in thickness, the lower section is cut through solid clay and rock salt.

Natural brine which has been formed underground contains two main impurities – calcium and magnesium. Brine evaporators will scale up if the calcium and magnesium are not first removed from the brine. The natural brine was therefore purified by treatment with soda ash and either hydrated lime or caustic soda. These cause the calcium and magnesium present to form a white precipitate which settles leaving clear pure brine which is decanted off ready for evaporation. The high purity of Murgatroyd's Brine well meant very little treatment was required.



Sonar survey of the Brine Shaft, showing the shaft outline and the location of the pumps.

8ft X 8ft to 60 ft depth
Hit first rock salt bed at 200ft
Then 5ft X 5ft to 274 ft
Boarded with pitch pine with iron dogs throughout
Adits (4ft square, timbered) at top of first salt bed (200ft)

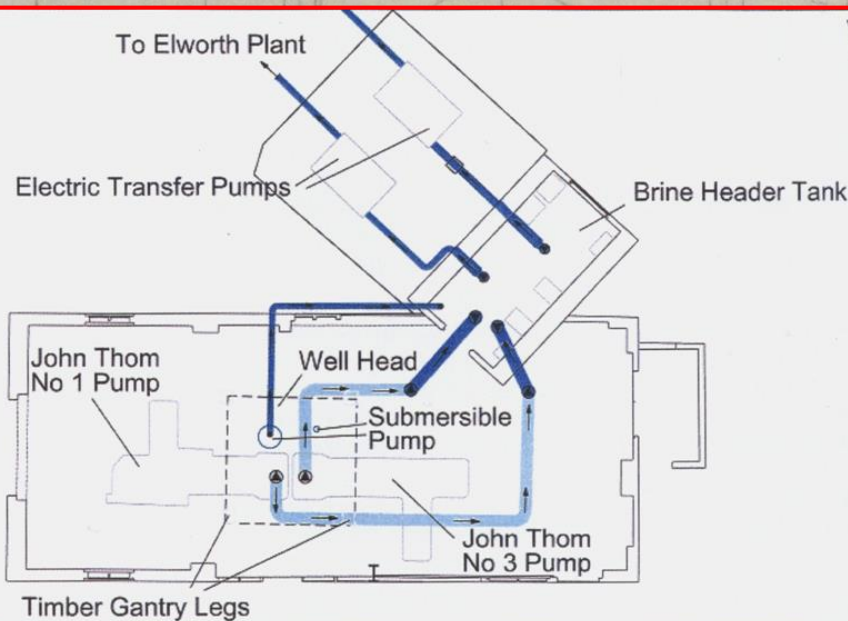


Diagram illustrating the flow of Brine from the three pumps

The John Thom Pumps

The works first had electricity with the installation of the No 1 pump in 1933. In 1952 a further John Thom Pump was installed alongside – this is No 3 in Thom's records. Their manufacturer's description is: 'Motor driven, reciprocating, single acting bucket and plunger. 9.5-inch diameter bucket, 3 ft stroke, 20 strokes per minute. Pumping capacity 9,000 gallons of brine per hour with the working barrel placed 200 ft below the surface' "First of all, it was running at 31 strokes a minute, just the one pump, my word it used to gallop! It had two big end bearings snapped through it, and we had a bent beam. They put a resistance in and pressed it down to 18 strokes a minute and it worked alright then". **Jack Ashley, Pump man.** The No.3 pump was very similar to No.1 and finally replaced the old steam engine. The engineering records do not specifically say as much, but the steam pump was kept in service to overcome a delayed delivery by John Thom and Co. ordered on the 10th October 1949. By 1953 this had been delivered and installed. The 1890 beam pump, steam engine and boiler were all taken out in due course.

The Beresford Pump

A further development to the pumps was made, when No. 4 pump was installed, positioned in the shaft between the two John Thom pumps. The submersible pump is by Jas. Beresford, model 3KT S13-5, a 3-stage centrifugal rated at 10,000 g.p.h. of brine at 132ft head consuming 12.5 h.p. The integral motor is rated at 13.0 h.p. This pump was installed in 1965 and has proved extremely reliable, providing a 33% increase in the brine raising capacity. It was the ideal pump for remote or automatic operation that had ever been produced. This pump is truly submerged with the pump and electric motor all suspended at the bottom of the pipe going down the shaft.

The pump was removed in 2019, to salvage and restore it for display, there were 11 riser pipe sections of 12ft (132ft) plus the pump at the end measuring 10ft, so the pump was set between 132ft and 142ft below the surface.