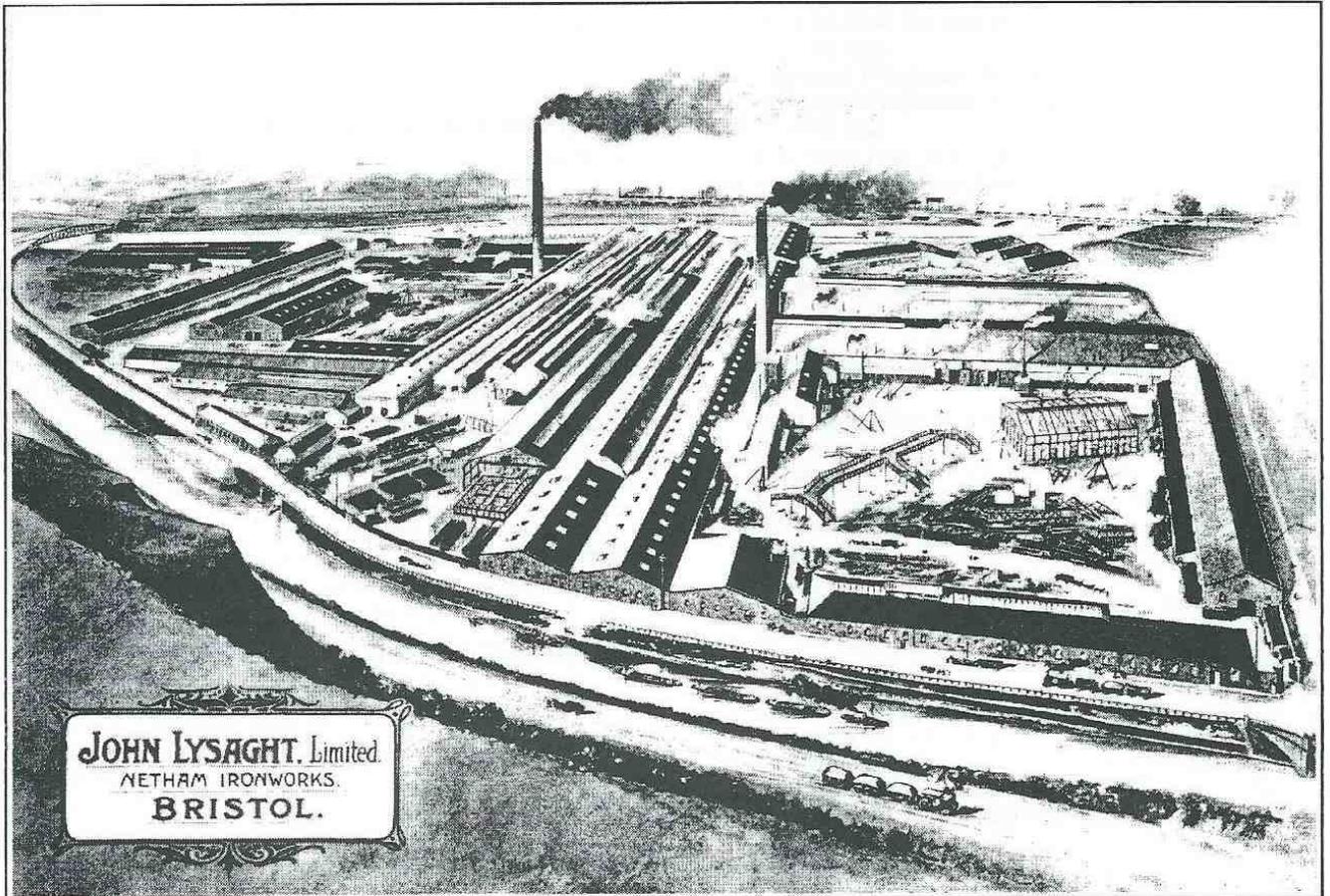




John Lysaght's Head Office at St Vincent's Works, Bristol



Lysaght's old Feeder Farm site works

Under His Own Sheets: The Lysaght Story

Raymond Holland

**BIAS Brunel Prize 1996
highly commended**

This story arises out of research into the Netham Chemical Company Works, Bristol! One of the customers of the Netham Works, taking hydrochloric acid and ammonium chloride, was John Lysaght who had set up in a very small way making galvanized buckets in Bristol in 1857 and whose business expanded rapidly over the next 30 years.

Early Beginnings

The first British patent for hot-dip galvanizing was granted to a man named Crawford in 1837. A Mr Clark applied this novel process of hot-dipping to the production of galvanized iron buckets at a small yard in Temple Backs, Bristol, near to what is now Temple Meads Station. When he died in 1857, his son, who was left well off, offered the galvanizing business to his friend as a free gift. His friend was a young Irishman, John Lysaght, born 1832 and bred in County Cork but educated in Bristol. So began the Lysaght story.

John Lysaght rapidly moved into the galvanizing and corrugating of sheet iron and before the year 1857 was out, he had adopted the 'ORB' trademark. Corrugated iron was being made by steam-power from 1854. Corrugation gave the iron great strength and when combined with a coating of zinc, it not only looked attractive but was resistant to rust. Many other products were made, mostly for agricultural use: cattle, sheep and pig troughs; cow cribs and manure pumps; corn and flour bins; tanks and cisterns; turnip skips and beer cans... the smallest size of the latter was one gallon! Probably Lysaght's best known galvanized product was the hip-bath, an essential part of Victorian family life.

John Lysaght soon began to need bigger premises, which he found in 1860 on a four-acre site at St Vincent's, in Silverthorne Lane. It was part of the works of Messrs Acraman, Morgan and Co, famous for making the machinery for the first ocean going steamer, the *Great Western*, -launched 19 July 1837- but this firm then collapsed. The site had the advantage of both rail and river communication.

Philip John Worsley, when he was the manager of the Netham Chemical Company Limited, called to make the acquaintance of John Lysaght. He wrote in his recollections:

He showed me over his works and became an important and very keen customer, his trade increasing rapidly. When he had been going for some two or three years, he consulted me as to whether I thought he would be Justified by the prospects of his business in

taking, on lease, the largest of Acraman's engineering sheds next to the one he then occupied I advised him to take advantage of the opportunity.

From that time his business has increased by leaps and bounds, especially in his trade with the colonies. After a time, in 1876, he took the old Feeder Farm close to Netham and established spelter [zinc] furnaces there.

The post-1890 diagram of Lysaght's old Feeder Farm Works indicates the growth of the business to occupy fully the 13 acre site. It also shows the Netham Chemical Co Ltd alkali waste heap in the foreground, and, at the extreme left, the original Brislington Bridge built by John Lysaght Ltd in 1890. This opened up the Brislington Estate on which St Anne's Board Mills was built in 1913. The present New Bridge dates from 1936.

The old Feeder Farm site became known as the 'Country Works'. It was supplied with raw materials via the Feeder Canal and prior to 1936 also via the River Avon. At the riverside wharf there was a submerged wooden platform to support vessels when the tide went out, thus stopping them settling into the mud.

The inlet from the Feeder Canal was sealed and the works basin filled in after 1945. During the war the basin had been used to provide water for fire-fighting. Viewed from the opposite bank of the Feeder the inlet is still visible. It is interesting to note that John Powell, writing about the Floating Harbour, relates that in 1871 an unsuccessful attempt was made to 're-open' an extension of this inlet from the Feeder and its lock into the River.² This was described as the Feeder Cut. The City Docks Engineers doubt whether this outlet from the Floating Harbour ever existed!

The 'Country Works' was the construction works. Every kind of structural ironwork was made: public and exhibition buildings; churches and parish halls; dock warehouses; large and small storage tanks; railway stations; farm buildings; shepherds' huts; cricket pavilions; and bridges. One such bridge, still in use in 1996, is the nearby Marsh Lane bridge over the Feeder.

The Production of Zinc

A newspaper article in the *Bristol Times & Mirror* 1883 stated that a furnace had been erected at St Vincent's Works:

...for the purpose of testing whether spelter, ie zinc, could be successfully made here or not.... The furnace is built on the latest Silesian principle, and the operation is a very curious and interesting one. When in full blaze it is a veritable inferno, and the attendant workmen, as they pass to and fro its front, with the lurid glare full upon them, look like so many demons.

The experiment was a success for the article confirms that at the Netham Country Works 'the spelter furnaces are all but finished and will probably commence production next week'. The production of spelter at the Netham Works led to frequent mentions in the Alkali Inspector's Reports:

*Many complaints have been received respecting Works No 1818, [The Netham Chemical Co Ltd] in all cases the nuisance complained of has been found to emanate from a neighbouring Spelter Work. The Work is situated at a lower level and the dense fumes which are discharged from it passed over or through the Alkali Work when the wind blew in that direction. Thus it is easy to understand that persons who reside on the still higher ground would imagine the Alkali Work was to blame.*³

*There were numerous complaints about metallurgical processes... unfortunately, these processes do not come under the supervision of the Alkali etc Works Act and consequently these works are not visited by us.*⁴

The amended Act of 1892, Schedule part 2, included zinc works, but only those works in which zinc was extracted from the ore.⁵

Messrs Lysaght's is named in the next report -this is very unusual and indicates the concern shown by the Inspector: *Lysaghts attempted a modification to one furnace, which afforded great relief to the workmen and less nuisance to the neighbourhood.*⁶

This was so successful that Report 31 (1894) tells that 'they constructed a second furnace on the same principle.'⁷

Again unusually, Dr Alfred C. Fryer, the local Alkali Inspector, in his report names two members of Lysaght's staff. In 1895 & 1898: Mr J. Bernal Gregar - Assayer & Analytical Chemist and in 1902: Mr B. Beddoe - Works Manager. Their experimental work to reduce the escape of fumes was commended.

In 1904, the Chief Inspector wrote:

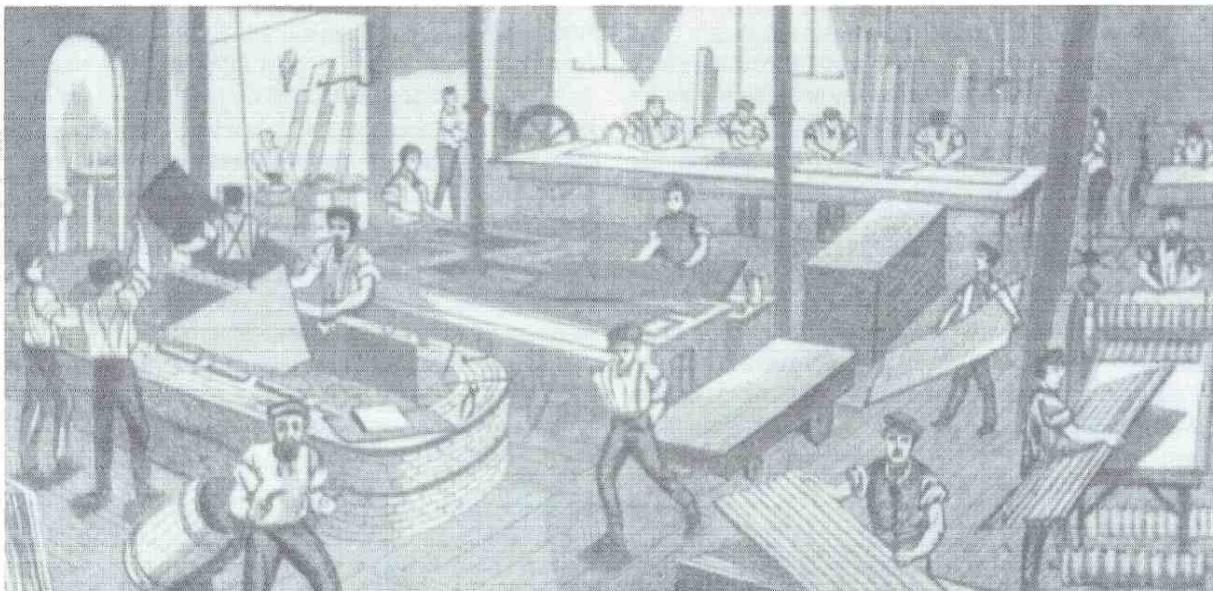
*The problem of preventing the pollution of the atmosphere from the cloud of white vapour escaping from spelter works still calls for consideration. The vast number of nozzles and the large dilution with air as soon as the fumes escape from the nozzles, render its solution particularly difficult. Where however any attempt is made to collect the deposit, we are informed that the zinc dust contains as much as 35-40% of zinc. Although little has been accomplished in reducing the escape of zinc oxide into the atmosphere, yet it can be claimed that on account of better arrangements for carrying the fumes away from the retort houses, the comfort of the men employed in charging and attending the retorts is greatly enhanced.*⁸

It was not until 1900 that the Alkali, etc, Works Regulation extended the operation of the Act to include 'Works for the extraction of zinc, not only from the ore, as formerly, but also from any residue containing that metal.' Since Lysaght's were not registered until 1892 they must have been working zinc skimmings and residues, not zinc ores. John Lysaght Ltd took 'muriatic acid' (the old name for hydrochloric acid) and 'grey galvanizers muriate of ammonia' (an old synonym for ammonium chloride) from the Netham Chemical Co Ltd. These products were used at the St Vincent's Galvanizing Iron Works, St Philips and at the Netham Country Works, where galvanized iron sheets, corrugated sheeting and wire netting were produced.

The Galvanizing Process

The process of 'hand galvanizing' was described as a transformation 'in black, out white'. In 1883 the pot, for small items at St Vincent's, contained 25 tons of molten metal.

Before dipping in a molten bath of zinc, the first part of the process was 'pickling', that is, the sheet iron or fabricated item was cleaned free of rust by dipping in hydrochloric acid.



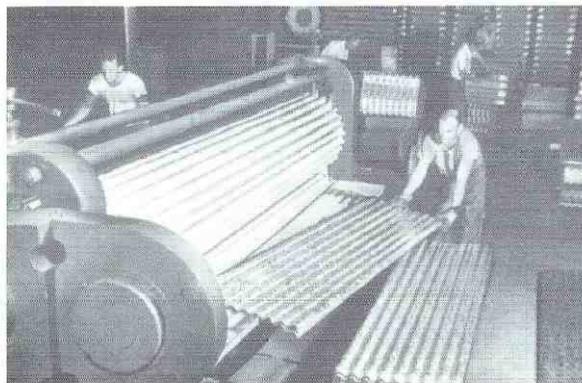
A galvanising plant, from a mid-nineteenth century print

The molten bath of zinc and tin at a temperature of approx 450°C contained ammonium chloride which acted as a flux. The flux blanket floated on the top of the zinc bath. The sheets came out clean through the flux layer. The sheets were placed in water to cool and to wash off any flux remaining. They were then passed through a drying machine before going onto be corrugated. The dry finished sheets were packed in large boxes interleaved with felt, ready to be sent all over the world.⁹



Hand galvanising at St Vincent's Works

Corrugated galvanized sheeting was used for buildings of all descriptions, anything from a church to a squatter's hut! After John Lysaght's first visit to Australia in 1870, he used to quip that on his travels, no matter where he went he 'could always have slept under his own sheets!'



Corrugating machine at Country Works

In 1883 John Lysaght Ltd was also the largest maker of wire netting in the world. Up to 1869 wire netting was made by hand, a tedious method. From this date, wire netting was produced in increasing quantity by machines. Wire netting sold well in Australia, protecting crops from rabbits, kangaroo and wallaby.



Weaving wire netting at Country Works

The Later Years

In 1878, to ensure continuity in the supply of satisfactory raw material, John Lysaght decided to roll his own iron. So he bought the Swan Garden Iron Works in Wolverhampton. All the production from this works came to Bristol by the barges of the Severn Canal Company. The business flourished and it was necessary to extend St Vincent's Works. There are photographs of the extension in progress but the date is unknown.

1881 marked the incorporation of John Lysaght Limited, to carry on the business of Ironmasters, Galvanizers, Construction Engineers, Wire Netting and Hollow-ware Manufacturers, etc, with a Registered Capital of £162,000.

The Head Office building was erected in 1886 in Silverthorne Lane. The Lysaght centenary book records:

*The resulting edifice is almost as bizarre a medley as the Albert Memorial, built just a little earlier. The exterior is Medieval Baronial, in hewn stone, lacking only a portcullis and drawbridge; the interior is Victorian Flamboyant, with the ultra-sanitary tiled walls and pillars of the imposing staircase providing a permanent exhibition of the most florid products of the Art Department established by Henry Doulton in 1872.*¹⁰

Into the Twentieth Century

John Lysaght made spectacular progress from his start in 1867 with six men and one boy. By 1864 he had 29 men and boys. Fourteen years later in 1878 there were 400 workers: men, women and boys. The output was 1,000 tons a month. After 24 years, in 1881 when the business was incorporated, the capital of the firm had risen to £162,000.

From 1878 sales of galvanized sheets doubled every ten years, peaking at 143,000 tons in 1913. Two factors helped the business: the Australian gold rush from the 1850s and the expansion of the colony. In 1880 a selling agency was set up in Australia: The Victoria Galvanized Iron & Wire Co. By 1885 they were selling 30,000 tons a year!

When John Lysaght died in 1895, he was succeeded as chairman by his eldest surviving son, Frederick Percy. Other Lysaghts were to follow him and carry farther the work of the founder.

By 1898 Swan Garden Works had become merely a foundry and was supplying chilled cast iron rolls to the new and larger Orb Iron Works built at Newport in 1896, where three rolling mills were working eight hour shifts.

In 1901 John Lysaght Ltd went public with an authorised capital of £700,000 and in 1912 a new steel works was opened at Normanby Park, Scunthorpe. This works was reconstructed and modernised in 1953.

The Bristol Works were crippled by the first world war - black iron, the raw material, was in short supply and

transport for the final product was virtually impossible. Australia was cut off and so it went on alone.

From 1919 Steel was being supplied for galvanizing by both Lysaght's Orb Iron Works and by Joseph Sankey & Son. In 1920 the Lysaght/Sankey organisation began fruit-fill enterprises with the GKN Group (Guest, Keen and Nettlefolds).

During the second world war. Lysaghts in Bristol was busy at St Vincents making Bailey Bridges and components for PLUTO (pipe line under the ocean) and floating tanks for the Mulberry Harbours used for invasion landings. The Netham 'Country Works' was chiefly engaged on tanks but also made anti-submarine netting, prefabricated ship structures, anti-aircraft guns and shells. The Netham works was bombed in 1940, when the galvanizing plant was badly damaged. Instead of refurbishing the plant the galvanizing facilities were moved to Newport in 1945. After the war in 1947, The Steel Company of Wales was formed. Lysaght's and GKN were two of the founder members.

In 1950 the chief post-war development in Bristol was the incorporation of Rheem, Lysaght Ltd for the manufacture of metal drums at the St Vincent's Works. In 1996 Rheemco Ltd retains the Head Office building in Silverthorne Lane and continues dmm production on that site.

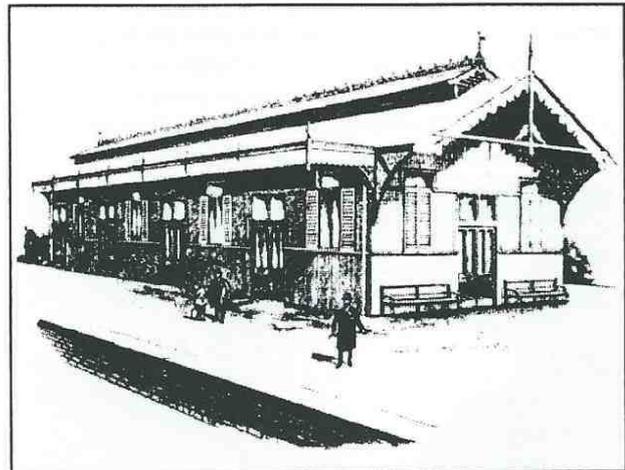
When in 1972 the Netham Country Works closed down, some of the galvanizing equipment was purchased and moved to Emery Road, on the Brislington Trading Estate, where Garland Group Ltd has continued the production of galvanized items, mainly of scaffolding poles.

In 1996 the Netham Country Works site, which saw much pioneering work in the manufacture and export of steel

and galvanized steel products, is now flourishing again but it has become a trading estate.

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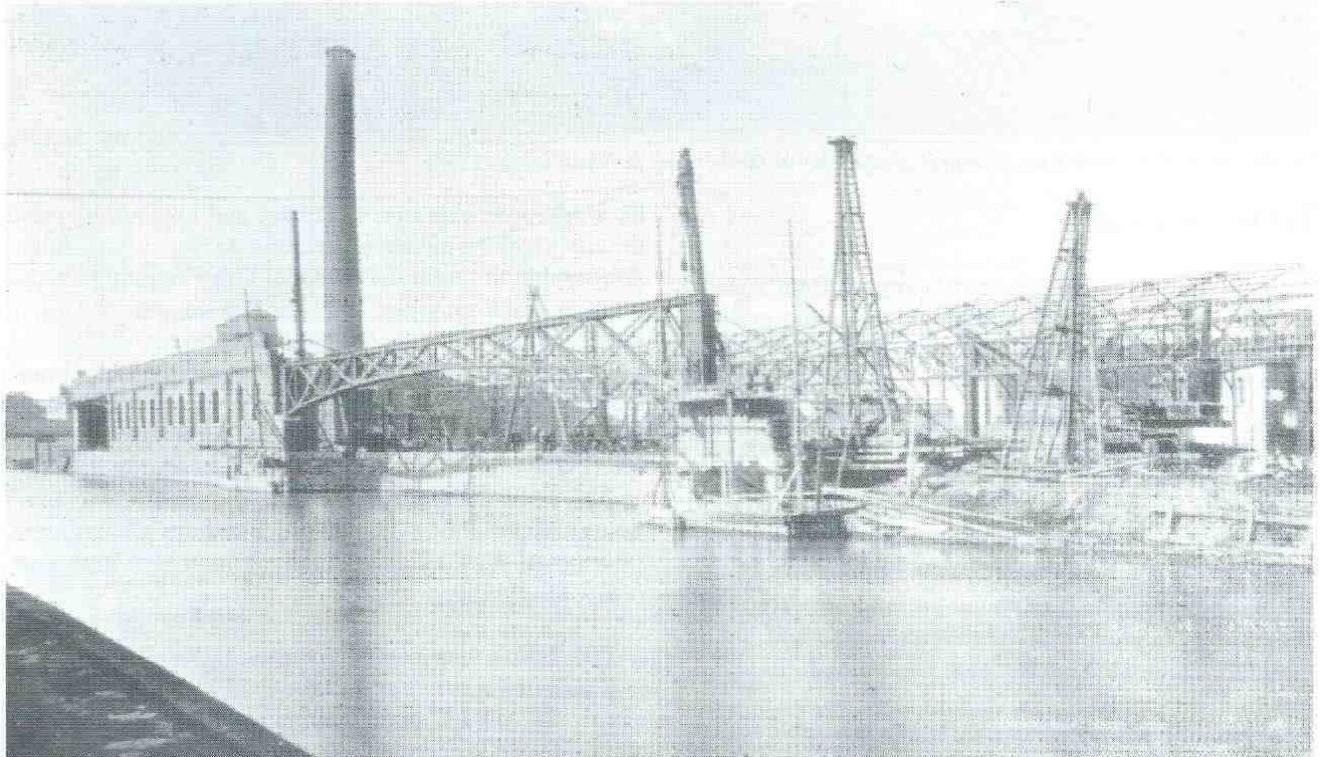
A nineteenth century railway station



1890 Brislington Bridge



Smiths' shop at St Vincent's Works



Extending St Vincent's Works, date unknown