

# *Sourcing brickmaking salting and chemicals at Prestongrange*

*A resource pack for teachers and students*

***This Resource Pack*** is one of a series offering an introduction to local history while fulfilling National Curriculum targets across a number of subject areas. It has been designed for the 5-14 age range and mixed abilities.

## **Contents**

- 1. History***
- 2. Summary***
- 3. Glossary***
- 4. Timeline***
- 5. Curriculum Targets***
- 6. Activities***
- 7. Further Investigations***



*Beehive Brick Kilns, Prestongrange Colliery Brickworks  
Scottish Mining Museum Trust*

## *1. A Brief History of Brickmaking, Salting and Chemicals at Prestongrange*

### **Salt**

Records of the salt industry in Prestonpans begin with a charter giving use of the Prestongrange lands to the monks of Newbattle Abbey. The terms of this charter suggest that salt and coal were already being produced at this time.

References to the early salt industry are mainly in the form of tax records, legal statutes, Treasury statements and Accounts, place names (such as the 'Salters' Way') and folk stories. These sources indicate that salt was a major Scottish industry and one of its foremost exports.

Christopher Whatley's definitive study, 'The Scottish Salt Industry, 1570 to 1850', provides a wealth of statistical and social information for the post-Reformation period, when ownership was gradually transferred from the Abbey to individual proprietors. By the 16th century, most salt pans were essentially family operations. By and large, the salt produced from these operations was of poor quality. The need to make up for time spent on repairs and maintenance required intensive salt production when the pans were active. According to Whatley, Prestonpans parish (including Prestongrange) in 1716-17, accounted for 29% of the total salt production from Forth Estuary saltworks, rising to 37.3% by the end of the century.

Many small scale operations were absorbed by larger estates, which could more easily weather fluctuations in the price of salt and the expense of equipment and maintenance. Estate

owners welcomed the cash income from the sale of salt, since it helped to finance the cost of coal mining operations. The Factor's Account book from Prestongrange in 1716-17 identifies salt as comprising 63% of the non-agricultural (and therefore mainly cash) income from the estate. However, at Prestonpans, many small-scale operations survived and in the early 18th century, the estimated Prestonpans output was approximately 2,000 bushels of salt per pan per annum, compared to a Scottish average of 4,500

Although Scottish export markets were limited by a range of statutes following the Union of Parliaments in 1707, Scottish salters secured a virtual monopoly of the home market and by 1796, the Salt Association, the 'Proprietors of Salt Works on the Firth of Forth' was regulating output and determining domestic prices. At this time, the Prestonpans area boasted 14 saltmasters and agents. However, by 1823, when all salt duties were repealed, imported rock salt was arriving in Scotland and Pigot's Directory of Scotland in 1825-6 records only 8 saltmakers in the vicinity of Prestonpans. By 1860, there were only four. The late 19th century saw a brief revival, probably due to the use of salt for glazes in pottery production, but by 1902, there was only one working unit in Prestonpans. The last Scottish salt pan closed in Prestonpans in 1959.

### **Chemicals and Soap**

From the 16th century onwards, an increasing understanding of chemical processes brought an increase in

industrial use of the by-products of salt production. It was this which helped to maintain the importance of the salt industry up into the 20th century.

The manufacture of sulphuric acid or 'oil of vitriol' began in Prestonpans in 1749, when John Roebuck and Samuel Garbett set up the world's first successful large scale sulphuric acid manufactory. In order to boost the linen trade, whitening agents were free of tax and sulphuric acid offered a faster, cheaper alternative to previous bleaching agents. These two English scientists chose Prestonpans for several reasons: the salt workers were already experienced in dealing with corrosive agents, ready fuel supplies were available from local coal deposits, the East Lothian bleachfields offered a nearby commercial market and transportation links were good. Prestonpans also offered the privacy essential for a new process which depended on the use of lead containers instead of glass, a technique easily imitated by competitors. However, the work was not easy and various surviving records testify to its environmental impact; the fumes, the corrosive damage and the dreadful conditions endured by workers within the factory itself. But demand for sulphuric acid was high, great profits were made and the enterprise continued to trade under various owners, despite opposition from local residents and despite vigorous competition from other manufacturers until, by 1784, the company's acid works was the largest in Britain. Although there has been some debate regarding the exact location of this works, the Haddingtonshire Sasine Register indicates that it was situated where the current Preston Links shopping precinct is located.

From the late 18th century onwards, sulphuric acid was superseded by the use of chlorine as a bleaching agent and by 1825-6, there was no vitriol company or chemical making at Prestonpans.

### **Soapmaking**

By the middle of the 18th century, Thomas Paterson was established as a soap boiler in Prestonpans. Tallow (animal fat) was available from the surrounding agricultural land and local coal provided fuel. Another ingredient, alkali, was available from kelp, salt was locally available and there was a ready local market, both industrial and domestic. This factory, located west of the brewery on the seaward side of the High Street, was a small but highly successful operation. Soap was produced in three iron vats, each about 10 feet high, heated first by open fires, then by steam pipes, with the later addition of three steel vats. A variety of soaps was produced, for household and personal use as well as laundry detergents. The business continued in the hands of family members with little change in methods or processes, until the 1950s, when the economies of scale and the advertising power available to large scale operations meant the eclipse of such small, family-run businesses.

### **Glass**

By the 17th century, the application of coal as a fuel meant an increasing use of glass in Britain. Glassworkers brought from abroad were gradually replaced by local workers and as early as 1662 a traveller, John Ray, described glass being made on the East Lothian coastline from a mixture of kelp and sand, heated and formed in containers made from pipe clay. This description probably refers to a glass making enterprise run by the Morisons of Prestongrange. In 1697, an Act and ratification from the

Scots Parliament permitted William Morison to establish a glass manufactory at Morison's Haven. The proposed products included bottles and a variety of other glassware such as spectacles and window glass. By the period 1716-23, estate accounts indicate that only bottle manufacture continued and shortly afterwards the glassworks site was taken over by a pottery. Finally, in the 19th century, the laying of colliery railway lines and erection of the brickwork resulted in its demolition.

### **Bricks, tiles and heavy ceramics**

Brick manufacture did not develop early in Scotland, where there were ample supplies of stone. However, tiles were worked from medieval times, especially for the decoration of religious houses. By the late 18th century, brickmaking for house building was on the rise, as was an interest in the hand manufacture of earthenware tiles and pipes for field drainage, especially in places where a suitable supply of clay existed. This was the case along the coastline from Portobello to Prestonpans.

Once waste fireclay and shale ('blaes') from coal mining was recognised as having suitable properties for use in pottery and brick manufacture, production was closely linked to the source of these raw materials, as was the case at Prestonpans. At Prestongrange, an interest in agricultural improvement encouraged the manufacture of field drainage tiles which, in turn, led to the manufacture of heavy ceramics. In 1789, two sites produced tiles and bricks, one near the Old Kirk and another, using clay dug locally, at Ravenscroft.

By 1874 Prestongrange colliery and brickworks were owned by the Prestongrange Coal and Iron Company and it was during this period that the tileworks developed from a rural supplier of estate tiles to a major manufacturer of heavy ceramics, with a significantly increased workforce. Despite various changes in management, census records reveal that workmen were continuously employed in the output of a range of machine and hand-made bricks and salt-glazed wares, such as floor and roofing tiles, speciality bricks and furnace fittings, garden wares, pipes for water, gas and sewage and sanitary wares such as sinks and toilets. By the 1890s, the brickwork occupied a large area of the Prestongrange site, with large moulding halls and a variety of bottle and draught kilns.

From 1895, under the Summerlee Company, the brickwork continued to expand. New kilns were built for glazed pipe production. Bottle kilns were replaced by new draught kilns, which survived well into the 20th century and in 1910, a Hoffman continuous kiln was built. This was replaced in 1937 by the Hoffman kiln which still stands today, as does the chimney of the original kiln.

Prestongrange Colliery continued to supply raw materials for the brickworks until its closure in the early 1960s. The increased cost of transporting raw materials and fuel to the site was a major factor in the gradual decline of the brickworks, which finally closed in 1975.

## 2. Summary

### **Salt**

Salt was made in Prestonpans even before the 12th century, when Newbattle Abbey took over the Prestongrange lands. After the **Reformation** in the late 16th century, **salt pans** were worked by individuals and large **estates**. By 1796, there were 14 **saltmasters**, but by 1902 only one was left. Scotland's last salt pan closed in Prestonpans in 1959.

### **Chemicals and Soap**

**Sulphuric acid** or 'oil of vitriol' was used to bleach linen. In 1749, John Roebuck and Samuel Garbett set up a sulphuric acid works in Prestonpans. The work was not easy due to fumes, **corrosive** damage and the dreadful working conditions in the factory itself. By 1784, the acid works was the largest in Britain. Gradually, **chlorine** replaced acid as a **bleaching agent** and by 1825-6, the factory was closed.

### **Soapmaking**

In the mid 17th century, Thomas Paterson established a soap boiler in Prestonpans High Street. Soap was produced for both household and personal use. The family business continued with little change in **production methods** until the 1950s, when competition from larger companies made it

impossible for this small, family-run business to continue.

### **Glass**

In 1697 William Morison established a glass **manufactory** at Morison's Haven. The proposed products included bottles, spectacles and window glass. By 1716-23, only bottles were made and shortly afterwards the glassworks site was taken over by a pottery.

### **Bricks, Tiles and Heavy Ceramics**

Before waste fireclay and shale ('blaes') from coal mining were used, bricks were made close to a suitable supply of clay. In 1789, two sites produced tiles and bricks, one near the Old Kirk and another, using local clay, at Ravenscroft. By 1874 Prestongrange brickworks was producing heavy **ceramics** such as roofing tiles and bricks, water, sewage and gas pipes. Gradually, **bottle kilns** were replaced by **downdraught kilns**. In 1910, a **Hoffman** kiln was built. This was replaced in 1937 by the Hoffman kiln which still stands today. Once the colliery closed in 1962, the cost of transporting **raw materials** and fuel resulted in the closure of the brickworks in 1975

### 3. Glossary

**Reformation**

The establishment of the Protestant Church in Scotland

**Salt Pan**

A large shallow container in which sea water is boiled to produce salt

**Estate**

A large area of land, often with a house, owned by one family

**Saltmaster**

The owner of a salt pan

**Sulphuric Acid**

A highly poisonous chemical compound containing sulphur

**Corrosive**

A corrosive substance will wear away other substances it comes into contact with, eg skin or rock

**Chlorine**

A poisonous greenish-yellow gas

**Bleaching agent**

A substance which whitens fabric

**Production Methods**

The way in which a product is manufactured

**Manufactory**

An old term for a factory

**Ceramics**

An object which includes clay as part of the material it is made from

**Bottle kiln**

A large 'bottle-shaped' oven with an inner chamber and a domed roof used for firing or baking pottery

**Downdraught kiln**

A kiln of similar shape to the bottle kiln, but where rising heat is not allowed to escape. It is forced back down again and reused before being sucked away

**Hoffman kiln**

A German kiln for firing bricks and ceramics or burning lime. The Hoffman kiln was constantly worked with no time wasted on cooling and heating

**Raw materials**

The ingredients (iron, shale etc) used to produce manufactured objects

## 4. Timeline

- 1150s** - Charter grants the Cistercian monks of Newbattle Abbey by Seyer de Quincy, Earl of Winchester to establish a coalworks and quarry between Whytrig Burn and the boundaries of Pinkie and Inveresk.
- 1308** - Act of Parliament forbids the use of coal in London due to smoke and fumes. Coal is used to heat large monastic and nobles' houses in Scotland whilst being associated with trade and industry.
- 1300s** - James V allows construction of Acheson's (now Morrison's) Haven. The Abbey is granted the right to transport coal from the workings beside the River Esk for shipment in small boats. Packhorses make the return journey with salt and with goods traded for the salt and coal shipped at the harbour.
- 1450s** - Accessible supplies of coal diminish while demand for coal increases.
- 1500s** - Scottish coal output is approximately 40,000 tons, but still from small scale workings. However, 6 tons of coal were needed to produce one ton of salt (salt was very profitable).
- 1609** - Export of coal forbidden.
- 1606** - Law reduces colliers to a form of slavery (serfdom).
- 1700** - Annual output of coal c4 million tons
- 1705** - Thomas Newcomen patents the steam engine.
- 1707** - Union of the Parliaments of Scotland and England sees the decline of the Prestonpans salt industry.
- 1722** - Tranent and Cockenzie Waggonway laid.
- 1741** - Evidence of the use of horse gins at Prestongrange.
- 1743** - Morrison's Haven harbour ceases trading.
- 1746** - Mining temporarily ceases at Prestongrange due to flooding.
- 1780** - James Watt successfully modifies Newcomen's design.
- 1800** - Total coal output for Britain is 10 million tons
- 1812** - William Murdoch perfects a method for extracting gas from coal for lighting.
- 1814** - Sir John Hope's Pinkie Railway between Pinkiehill and Fisherrow is constructed.
- 1815** - Tranent and Cockenzie Waggonway replaces wooden rails with cast iron.
- 1830** - George Grant-Suttie leases land at Prestongrange to Matthias Dunn
- 1830** - No 1 shaft sunk, re-opening the mine after more than 65 years.
- 1831** - Edinburgh and Dalkeith Railway ('Innocent Railway') constructed.
- 1838** - Waggon road at Prestongrange runs from pit bottom to working. Bearers replaced by wheeled rails.
- 1838** - Matthias Dunn gives up the lease of Prestongrange.
- 1840** - No. 1 shaft flooded.
- 1850s** - Turnpike System is introduced in Scotland.
- 1850** - The Prestongrange Company takes over the Prestongrange lease.
- 1850** - Opening of the mineral railway junction links Prestongrange Colliery with the main East Coast line.
- 1870** - Total output of coal in Scotland is 15 million tons.
- 1874** - The Cornish Beam Engine is installed at Prestongrange.
- 1878** - The Mining Institute of Scotland is established.
- 1893** - The Prestongrange Company fails.
- 1895** - The first mechanical washer for cleaning coal in Scotland is installed at Prestongrange.
- 1900** - 439 employed at Prestongrange Pit: 61 above ground and 378 below.
- 1905** - The Cornish Beam Engine has its pumping capacity improved.
- 1910** - 873 employed at Prestongrange: 153 above and 720 below (including many Irish immigrants).
- 1910** - An electric turbine pump is installed to pump water from Prestongrange.
- 1913** - Total coal output for Scotland 42 million tons.
- 1915** - total coal output for Scotland 35.25 million tons.
- 1945** - Total coal output for Scotland less than 20 million tons.
- 1946-7** - Nationalisation. The government takes over the coal mines.
- 1962** - Prestongrange Pit closes.

### 5. Curriculum Target: Knowledge and understanding of people in the past

STRAND	LEVEL C	LEVEL D	LEVEL E	LEVEL F
<p><b>People, events and societies of significance in the past:</b> Developing an understanding of distinctive features of life in the past and why certain societies, people and events are regarded as significant</p>	<p><b>Describe</b> the diversity of lifestyles of people in the past, eg the life of a peasant as opposed to a landowner</p>	<p><b>Describe</b> some features of societies, people and events of the past and suggest why they might be considered significant</p>	<p><b>Explain</b> the motives or actions of people in particular historical situations Explain the values or attitudes that characterised various societies in the past <b>Explain</b> why particular societies, people and events from the past are thought to be of significance</p>	<p><b>Apply</b> knowledge and understanding of the motives or actions of people in particular historical situations and/or the values and attitudes of particular societies in the past to reach conclusions on a given historical issue or question</p>
<p><b>Change and continuity, cause and effect:</b> Developing an understanding of change and continuity over time and of cause and effect in historical contexts</p>	<p><b>Make</b> a comparison between present and past lifestyles/circumstances/features. What is different? What is the same? <b>Give</b> some reasons for differences and for aspects of continuity</p>	<p><b>Identify</b> important features of a development that have changed over an extended period of time eg transport, role of women <b>Explain</b> in simple terms why these features were important and describe what effects they had on people's lives</p>	<p><b>Demonstrate</b> a detailed knowledge and understanding of the main features of a particular event/development/attitude with regard to change and continuity <b>Give</b> some reasons to explain why a specific historical event/action/development took place and what the specific consequences were</p>	<p><b>Apply</b> knowledge and understanding of the process of cause and effect to provide detailed explanation as to why a particular development/event took place and give balanced assessment as to the significance of its consequences</p>
<p><b>Time and historical sequence:</b> Developing an understanding of time and how events in the past relate to one another in chronological sequence</p>	<p><b>Put</b> a series of events with their dates in chronological order <b>Use</b> the words 'decade' and 'millennium' correctly</p>	<p><b>Explain</b> the meaning of the terms 'bc' and 'ad' <b>Place</b> a number of events from a specific historical development on a timeline that crosses BC/AD divide</p>	<p><b>Explain</b> the relationship between specific dates and the relevant century <b>Name</b> and place significant historical periods in chronological order</p>	<p><b>Compare</b> and contrast timelines from a significant historical period in different parts of the world</p>
<p><b>The nature of historical evidence:</b> Developing an understanding of the variety of types of historical evidence and their relative significance</p>	<p><b>Describe</b> ways in which people remember and preserve the past, eg war memorials and suggest reasons why they should do this</p>	<p><b>Suggest</b> a variety of sources of information about the past and what use they might be to someone studying a particular topic <b>Explain</b> the meaning of the term 'heritage' and give some examples, eg castles, literature</p>	<p><b>Suggest</b> ways in which society's awareness of its own past can affect its present and future development eg devolution in Scotland, conflict/peace in Northern Ireland</p>	<p><b>Describe</b> how heritage and evidence can be used in both positive and negative ways eg to promote social, economic or political ends</p>







