A Land Transformed

Transport

The beginning of the nineteenth century was an era of rapid expansion in the Cornish extractive industries, particularly copper mining. This expansion was hampered by the region's slow and congested transport infrastructure. Copper ore had to be shipped to South Wales for smelting and coal brought back to fuel the steam engines on which the mines depended. Vast quantities of timber were also needed for pump rods and underground shoring, and this was brought by sea from Scandinavia and Canada. Almost everything had to be moved by huge mule trains.

Hayle Harbour. Hundreds of thousands of tonnes of copper ore were exported from here for smelting and vast quantities of coal and timber for the mines passed through this historic port. In this view the site of Harvey's foundry is in the top right, the railway crosses the top and the quays serving Harvey's foundry are in the left and centre. The twin port of Copperhouse lies a little way to the left on this photo.

Despite its long coastline Cornwall had few large specialised ports. New industrial harbours were constructed to handle the mineral trade. The most important were Hayle, Copperhouse, Portreath and Devoran, as well as smaller ports such as St Agnes, Par and Charlestown. Elsewhere harbours and quays were expanded to cope with the growth in mineral output. Together these form an internationally significant group of eighteenth and early nineteenth century industrial ports.

Until the nineteenth century the trackways and roads of the mining districts were unsuitable for wheeled transport so carriage of materials between the mines and the

ports was dependant on pack-horses or mules. Each mule carried a load of 150kg and mule trains were made up of anything between 20 and 60 animals. During the Napoleonic Wars (1803 – 1815) the rise in fodder prices hastened the introduction of tramways and some of the first railways in the world.

The earliest Cornish railways (still initially powered by horse and mule) linked the copper mines with the mineral ports. The Portreath Plateway of 1809 linked the mines of the Gwennap district with Portreath Harbour, the Redruth and Chasewater Railway (1824) linked Gwennap with the port of Devoran, and the Hayle railway of 1834 linked the Redruth/Camborne district with Hayle. The railways also served Cornwall's other extractive industries: for instance an incline was added to the Liskeard and Caradon Railway in1846 to serve Cheesewring granite quarry, and granite from Kit Hill quarry was transported on the East Cornwall Mineral Railway which was originally built in 1872 to connect the Kit Hill and Gunnislake mines with the port of Calstock.

Headquarters of the Cornwall Minerals Railway (CMR) at St Blazey with the loco shed and turntable. By the twentieth century the CMR had been absorbed into the Great Western Railway and new branch lines running into the clay district had been opened. Some pits now had a direct rail connection and pan kilns were built beside the railways. Where the pits were distant from the railway, pipelines were laid to carry liquid clay to the railside pan kilns. *Photo © Cornwall County Council Historic Environment Service*

A particularly well-preserved example of the industrial transport infrastructure survives in the Luxulyan valley. At the base of the valley the Par Canal was built to take copper ore from inland to the newly created copper port at Par. The harbour at Par became important for the china clay industry after 1842 when a tramway was built through the valley into the clay district. The tramway was rebuilt during the 1870s as a steam railway and extended to the port of Fowey. The Cornwall Minerals Railway, as it was known, was responsible for the rapid development of Fowey as Cornwall's major china clay port.

Ancillary Industries

The boom in the Cornish mining and china clay industries led to an increased demand for quarried stone for engine houses and other industrial buildings. The Cornish brick industry, whilst never of great economic importance, developed mainly to serve the needs of the mining and china clay industries. In particular, bricks made of impure china clay were highly heat-resistant and were in great demand for the boiler houses, calciners and smelting furnaces of the mining industry as well as for the building of pan kilns for the china clay industry.

Other industries developed and flourished: ropes, chemicals, charcoal, clothing, candles, crucibles and scientific instruments were all needed to sustain the mining boom. The most important ancillary industries were foundries and smelters. From the early nineteenth century onwards steam engines were made in Cornwall. The largest foundry was Harvey's at Hayle; it was established in 1779 and became the pre-eminent engine foundry in the world. Harvey's and its local rival, the Copperhouse Foundry, directly influenced the development of Hayle into two distinct urban areas; Harvey's Foundry Town beside the railway and Copperhouse on the eastern arm of the estuary.

Another product essential to the extractive industries was explosives. The adoption of gunpowder for rock-breaking was a huge technological advance, the scale of which is illustrated by the fact that in 1836 alone, 30 tonnes of gunpowder were used in Cornish mines. Gunpowder was imported until 1808 when the first factory opened at Perran-ar-Worthal near Falmouth. Dynamite was invented in the 1860s by which time high explosives were being used far more efficiently in underground mines and in quarries. In 1888 the principal Cornish manufacturer established the National Explosives Company and built its first factory in the protective environment of the sand dunes at Hayle Towans.

The high explosives factory at Hayle Towans. *Photo © Cornwall County Council Historic Environment Service*

Industrial settlements

Tuckingmill, Camborne. The town of Camborne and the Camborne/Redruth conurbation contains the best example in Cornwall of large-scale urbanisation associated with the Industrial Revolution. The townscape is dominated by industrial terraces, many of which remain largely unaltered. *Photo © Cornwall County Council Historic Environment Service*

The mining and associated industries employed huge numbers of people; in the boom years a quarter of Cornwall's population worked in the mines themselves. There was a constant movement of miners across the county as the fortunes of the mining districts rose or declined. Up to the mid nineteenth century every parish west of Truro experienced rapid population growth; as mining boomed in east Cornwall there was a notable shift of population from Gwennap and St Austell to Liskeard and Calstock. Villages such as Pendeen, Lanner and Four Lanes grew up and towns such as Redruth and St Just expanded rapidly (the population of St Just more than trebled between 1801 and 1861). Camborne grew from a small village to one of west Cornwall's major towns.

A similar influx of population to the St Austell area accompanied the growth of the china clay industry. In the second half of the nineteenth century as copper production, then tin, declined in the face of foreign competition, china clay offered steady work for miners facing the prospect of unemployment or emigration. This led to the creation of a new mining community in villages – Stenalees, Bugle, and Foxhole - on the moors above St Austell. St Austell itself was a new industrial centre and rapidly expanded with areas of new terraced housing and the large town houses of the clay company owners. On a lesser scale industrial settlements sprang up to house the workers of the quarrying industry. Villages such as Mabe, in the important dimension quarrying area in the hills above Penryn, were established for this reason.

Nanpean, showing a classic arrangement of industrial terraced housing. *Photo © Cornwall County Council Historic Environment Service*

Smallholdings

The majority of those employed in Cornwall's extractive industries lived in towns in terraced houses with only very small gardens or courtyards. Some were housed in rows of cottages with gardens in which food could be grown to supplement incomes. In the late eighteenth century, however, many miners laid out smallholdings; two- or three-roomed cottages with a few acres of land on which to grow vegetables and keep livestock.

Former miners' smallholdings at Goonbell, St Agnes. The characteristic pattern of small rectangular fields represents rough, uncultivated ground taken into agriculture during the nineteenth century. *Photo © Cornwall County Council Historic Environment Service*

Miners' smallholdings typically consist of small rectangular fields and were held under the three lives system. They are sited in areas which were formerly upland rough ground. Some of this land was farmed in prehistoric times and later formed the upper margins of the medieval farming zone. Whilst the best arable land had been enclosed by the seventeenth century these upland areas remained uncultivated and had been used as heathland grazing and as a source of gorse for fuel. During the eighteenth and nineteenth centuries over 50,000 hectares of upland rough ground were taken into cultivation. The establishment of smallholdings had a significant impact on the landscape which in many areas is still clearly visible.

Grand Houses, Parks & Estates

The extractive and ancillary industries made great wealth for a very small number of those engaged in them. As in industrial landscapes elsewhere in Britain, this wealth was openly expressed in the form of grand houses, parks and estates. Mineral rights to metal ores and the royalties due from them were vested in a small number of 'mineral lords'. These were mostly prominent landed families such as the Bassets, Boscawens and St Aubyns, which amassed fortunes at a scale which agriculture alone could not have provided.

Tehidy, located on the edge of the Camborne and Redruth Mining Districts. The Basset family transformed Tehidy into one of the finest country house estates in Cornwall. *Photo © Cornwall County Council Historic Environment Service*

The riches that minerals brought enabled Cornwall's industrial families to indulge in horticulture on a grand scale and many of them became nationally distinguished plantsmen and gardeners. The gardens at Glendurgan, Trebah, Trengwainton, Caerhays and Trewithen, among others, are all nationally famous. These gardens are distinctive because the maritime climate and their sheltered aspect provide conditions in which exotic plants such as camellias, rhododendrons, palms and tree ferns can flourish.