

FOUNDING THE POLY





The Poly today

The Poly is the Arts Centre in the heart of Falmouth in Cornwall – although in 1833 it wasn't created as an arts centre, and it wasn't called the Poly. It started its long life as the Cornwall Polytechnic Society. This booklet will describe how the Poly was founded, and the conditions in Cornwall that made such an organisation necessary – in fact, essential in Cornwall's Industrial Revolution.

Much of this account takes place on Restronguet Creek, which is fed from mid-Cornwall by the Carnon River, and flows into Falmouth's natural harbour, the Carrick Roads; the creek shows – muddily – at the centre of the back cover. Shipping in Restronguet Creek, mining in Cornwall, and forging in Perran iron foundry will be at the heart of this story.



Falmouth 1830

The Poly owes its existence to the Fox family of Falmouth. In 1759 George Croker Fox II recognised that this small town on the Carrick Roads looked set for a prosperous future, and transferred his business from Fowey to Falmouth. Here he traded under the name of G. C. Fox and Co., which became the most active and profitable firm in the town. Among many other businesses, the company acted as ship agents, the town's superb harbour having been the home port for the Post Office packet ships since 1688.

As the most westerly deep-water harbour in the United Kingdom, outgoing ships often made Falmouth their last port of call, and on their return, the first: "Falmouth for orders!"

G.C. Fox and Co had interests in coal mines in Wales, copper and iron smelters at Neath Abbey near Swansea, shipping on the Bristol Channel, fisheries, ship towage, railways, and timber.



Perran Foundry today

The Fox family, in partnership with the Williams family, were also the principal owners of the Perran iron foundry at Perranarworthal, between Falmouth and Truro – now converted to flats.

The Company shipped pitch-pine logs from Norway, which were barged and poled up from Restronguet Creek to season in the foundry's timber ponds. These were for use in the copper and tin mines which were the basis of Cornwall's industry in the 19th century, and which could not have survived without them.

The first photographer to bring light successfully to the underworld of the Cornish mines was John Burrow. The miners, each working only by the light of a single candle, had never seen what his sodium lamps now revealed. Burrow and his helpers had endless trouble clambering up and down the exhausting ladders, lugging the heavy cameras and tripods, fighting the heat, humidity, darkness, narrow tunnels, and the air full of dust from gunpowder explosions.



The Cathedral, South Condurrow mine

He tells how once, when he was ready to shoot, a cry came from overhead:

“Hallo down there. Fire!”

“DON'T fire yet!”

“We have fired. Get back under the stull!”

“How many?”

“Three. Look out!”

Bang! Bang! Bang!

They survived, but suffered another long wait for the dust to clear. Sometimes he and his helpers took only six or seven shots in a day.

In 1893 John Burrow published his best work in *'Mongst Mines and Miners*, a rare and beautiful book.



Mr and Mrs Burrow at a hanging wall

Since all shots had to be posed, John Burrow would never have succeeded without the goodwill of the miners, whom he found always friendly and helpful.

Mrs Burrow is on the left in her hard hat – just a felt hat hardened

with resin to support a candle stuck on with mud – and Mr Burrow is looking, rather thoughtfully, at the pitch-pine logs supporting that stull.

Without the lamps, all that the striker could have seen of the steel borer his mate is holding would be its polished tip reflected from the candle at his side. More working ‘pares’ (teams) can be seen by their candles.



The timbermen cut and installed the props

Timber was vital to the very existence of the entire Cornish mining industry. From the Journal of the Statistical Society of London, 1836:

Now, the consumption of 1836 was 36,207 loads of timber, which, at four trees to a load, is equal to 144,828 trees. If these trees grew fifteen feet apart, they would cover 7150 acres of ground; and if they were 120 years old, it would require the produce of 140 square miles of Norwegian forest to supply the mines of Cornwall.

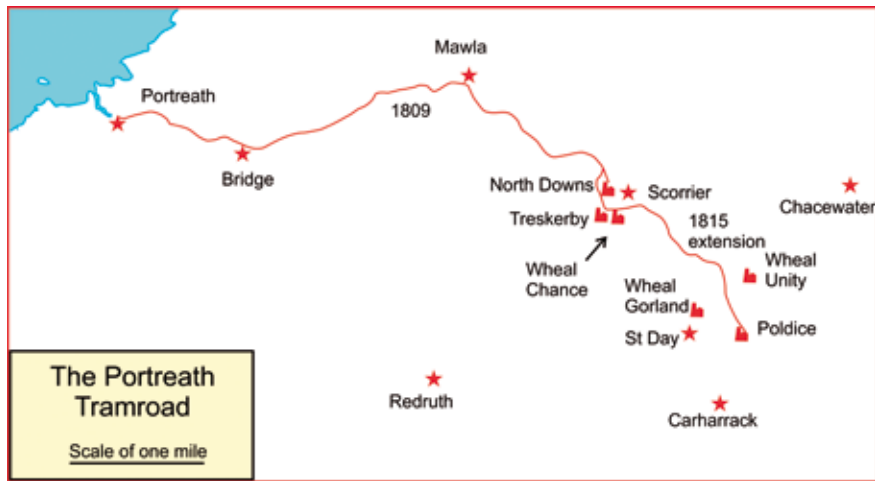


The entrance to Portreath harbour

In the early 19th century, the Gwennap area of Cornwall was the richest mining district in the country – it was even called the ‘most valuable square mile in the Old World’. At that time, the Gwennap mines produced one third of all the copper in the world, and much of the tin.

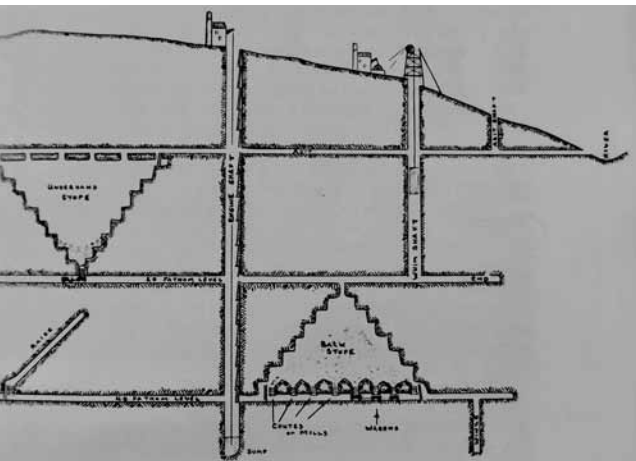
In 1782, G.C. Fox & Co., in partnership with the Williams family of Scorrier, leased the harbour at Portreath on the north coast. The harbour entrance was – and still is – just as difficult as it looks. In anything like a breeze, ships had to anchor offshore until the weather improved. It was small and awkward, but it was the best port on the north coast for shipping copper ore to Wales for smelting in the Company’s foundry at Neath Abbey. For coinage tax purposes, Cornish tin had to be smelted in Cornwall.

Smelting copper ore burned nearly eighteen times its own weight in coal, so having unloaded the ore in Swansea, the ships were reloaded with Welsh coal for the return journey.



A few of the many mines in north Gwennap

The Fox and Williams families also leased the Portreath horse tramroad, built to serve the local mines, and ending at the large mine at Poldice; and it was there that John Williams, the mine manager, and William Lemon, the main investor, developed one of the most important schemes ever to benefit the Cornish mining industry. Without it, some of the greatest copper mines in the world would have had to be abandoned, unexploited. It was the Great County Adit.



A mine's adit (top level) discharging into a river

When mines hit the water table, they flood. An adit is a level driven to discharge the flood water pumped from below out into the open air – into the sea, if it was close enough, or into a river or creek. Every mine had to dig its own adit, install pumping machinery, and find somewhere to discharge a constant flow of poisonous water 24 hours a day.

In 1748 John Williams of Scorrier and 'the great' William Lemon combined their genius and their money to conceive a single shared adit into which contributing mines could drain their flood water and 'gangue', the earthy waste substances in metallic ore.

This great tunnel eventually wormed its way for forty miles through Gwennap and served over a hundred mines – a hugely successful and profitable venture.

This is the portal where, at the height of the industry, the County Adit discharged millions of gallons a day into the Carnon River, which flows past Devoran into Restronguet Creek. Today it still runs through the old abandoned mines, and is still discharging.

The map on the next page shows that the Portreath tramroad was later extended to an eleven mile walking and biking trail from coast to coast, but in the early 1800s, both harbour and tramroad were reserved for the mines in north Gwennap. To create another harbour, the southern mines developed the village of Devoran, which became for some fifty years the busiest mineral port in Cornwall, even though the route round Land's End would be longer and more dangerous.



The portal of the Great County Adit today



The Bissoe Trail - Portreath to Devoran

At Devoran's deep-water wharfs, Fox family ships loaded their cargoes of ore or unloaded their Welsh coal. Ketches and lighters lay abreast, more lying at anchor, with the tug *Sydney* ready to tow them to the wharfs. The long waterfront bustled with porters, there was a boatyard, chandlers, warehouses, and timber yards. The Redruth and Chasewater tramroad, owned by G. C. Fox & Co, ran from Point, past Devoran and up to Redruth, with a branch line to the Portreath tramroad.

With the Perran foundry only a mile away, Restronguet Creek proved valuable territory for the Fox family business.

Further down the creek lay Point, a busy and active village with its own deep-water wharf (Lemon Quay), tin and lead smelting works, a bone mill, a lime kiln, the submarine Carnon tin mine, and a tall chimney carrying away the toxic fumes.



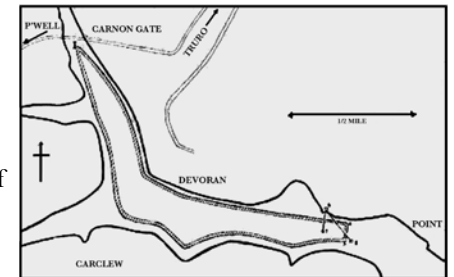
Devoran – the extensive wharfs are clearly shown



Point Smelting Works, 1857

The creek was a busy, noisy, smelly place, but shipping and smelting were not the only profitable activities.

'Streaming' was open cast mining, and from ancient times Restronguet Creek had proved rich territory as far as the tide allowed. To continue streaming down this tidal creek, heavy banks of mud and debris were built off each shore, with a strong dam at the end. A deep channel along the north shore let ships sail up to Devoran, while a channel along the other shore allowed logs to be floated up to the Fox foundry, leaving the creek bed deep in mud, but streamable.



An eye-witness account tells how '...here and there in the trenches might be seen the timmers working knee deep in water and a few squalid, half-clad boys wheeling the tin ore to the stream head in barrows.' The men streamed tin, arsenic, copper, lead, and, in tiny nuggets, gold.

For centuries the Carnon had been flowing through land rich in minerals, and from very early days, miners had streamed the river for both tin and gold.

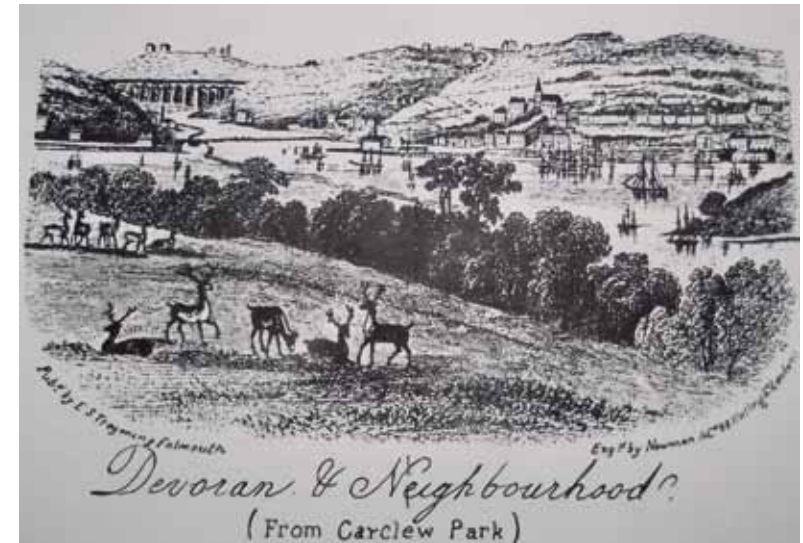


The Nebra Sky Disk

This is the breathtaking Nebra Sky Disk, unearthed clumsily and illegally in 1999 close to the German town of Nebra. It consists of a bronze disk nearly a foot wide, inlaid with gold symbols representing the sun or full moon, a lunar crescent, and stars. It is the oldest known depiction of the cosmos, and is now interpreted as a Bronze Age astronomical instrument marking the solstices.

To smelt bronze requires 12% tin, and for this unique creation, said to be nearly 4,000 years old, analysis shows that the tin and the gold had been ‘streamed’ from the valley of the Carnon.

Over some fifty years, four submarine mines along the creek were exploited successfully, while Devoran thrived as a mineral port.



Devoran from Carclew deer park

Most of the ‘setts’ (leases) belonged to Sir Charles Lemon of the Carclew estate on the south shore. In one case he had doubts about the application by a group of Adventurers from London to open a new mine.

‘I should be brought to consent only on Public Grounds of finding Employment for the Miners who are out of work and in such occasion I would submit to the inconveniences at Carclew and sacrifice my own comforts to the General Good.’

However, in 1876 serious floods up-country brought accumulations of mud and ‘gangue’ pouring down the valley, the County Adit flooded, the banks broke, the dam burst, and by 1900 the upper creek had silted up again. Point survived, but Devoran lost its deep-water wharfs and returned to a quiet creek-side life, disturbed, perhaps, by Brunel’s railway viaduct up the valley, but once again looking across a calm creek towards Sir Charles’s deer park. At low tide, though, mud from shore to shore.

And opposite Point at low tide a mound still appears in the middle of the creek – the blocked mouth of the ventilation shaft for the Carnon mine 60 feet below, where the tinnners tunnelled into the hard mud as the tides rolled overhead.

The shaft was made of interlocking cast iron cylinders. These were pressed together one by one by manoeuvring two heavily laden barges joined by a stout beam so as to bring the beam across the top cylinder, then waiting for the tide to drop. Each cylinder was then cleared of mud, and next day another would be pressed into place. The twelve cylinders were designed and cast at Perran foundry.

The Kennal River flows into Restroguet Creek, and here we are on the Kennal, sailing gently up to the foundry in the distance, alongside the channel for poling the logs from Norway up to the timber ponds. The Truro coach is calling for passengers at the Norway Inn, which is still there on the Falmouth road. The bridge leads to Sir Charles Lemon's Carclew estate.



An Arcadian paradise

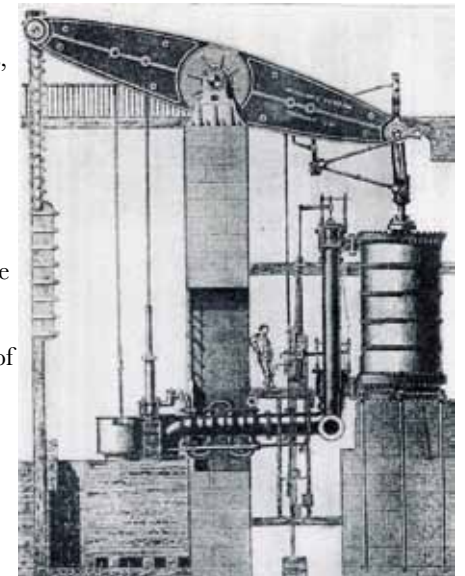


Perran Foundry, founded in 1791

Here is the foundry in its most prosperous days in the 1830s, when machine shed, moulding shop, smithy, pattern shop, sawmill and brass foundry were all powered by five water wheels in leats on the Kennal river. Not until 1860 were they supplemented by steam.

The foundry was producing steam engines, boilers, water wheels, capstans, cranes, traction engines and pumps as well as the Cornish beam engines, and the foundry developed a reputation for the excellence of its products. The workforce of about 200 employees were highly skilled and enjoyed liberal, and teetotal, working conditions, a feature of the Quaker management.

The Great County Adit was draining many of the Gwennap mines, but they still needed those expensive pumps to keep them de-watered. Beam engines were designed and created here and shipped around the world – many were installed in the silver mines in Mexico, and three huge ones were used in draining the polders in Holland. The engine above was one of the biggest beam engines ever made, and was built at Perran foundry.



A beam engine made at Perran foundry.

In 1840 Barclay Fox tells how he *Arrived at Perran just in time to see the casting of the great bob (the beam in the diagram) –14 tons. A most superb sight; the impetuous lava stream, the eager anxiety of the men regulating the speed and direction of the dazzling flood, and the bloodvessel-bursting excitement of the foreman were altogether a scene quite cyclopean.*

The foundry was noisy and smoky, working hours were from 6 a.m. to 6 p.m., but it was said that *All who were employed there worked in an Arcadian paradise as compared with the grime and ugliness so common to many of the industrial centres of England.*

An accounts book records that *Over a period of twenty years, the firm had disposed of property to the value of £200,000 (very much more than twenty million today), yet scarce £10 had been expended on attorneys' fees.* A reliable firm.



Robert Were Fox II

By 1857 ownership of the foundry had passed to the Williams family, but when Charles Fox ran this side of the business, it was in this foundry that the spark was struck that would soon forge the Poly.

By the 1820's, Falmouth and the Fox family were prospering, as George Croker had predicted. As they prospered, the family moved out to build houses outside Falmouth - Glendurgan, Trebah, Meudon, Tregedna and Penjerrick, where they established large and exotic gardens, some of which are still open to visitors.

In 1832, a senior member of the firm was Robert Were Fox II, one of the most significant natural philosophers of his time. He wrote many papers for scientific journals, was a Fellow of the Royal Society, a geologist, natural philosopher, and an inventor. His friendships and his influence stretched far beyond the Tamar.

Of all his inventions, the most important was the Fox Dipping Needle, built by William George in Falmouth in 1845. Very few such needles exist today. In 1931 the Magnetic Observatory, Greenwich presented this beautiful device to the Poly, and after 175 years the magnets still work and the needle is still operable.

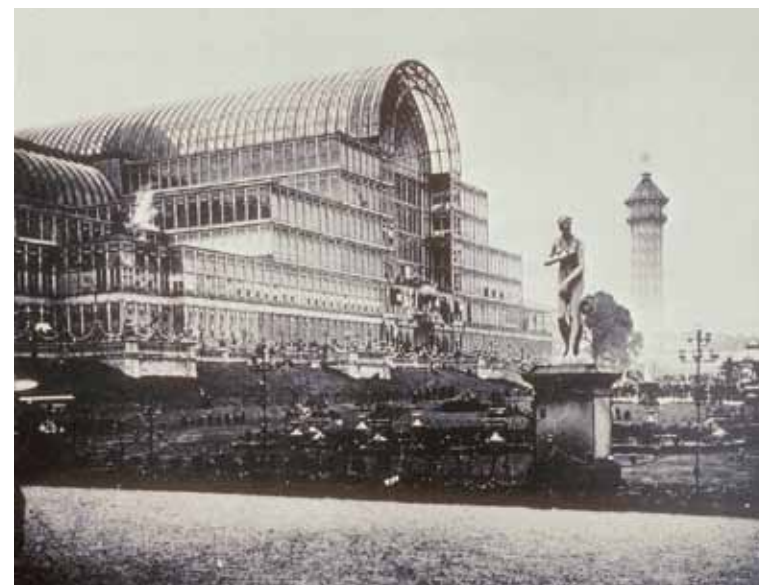


The Poly's Dipping Needle with accessories

In 2020 this rare model was taken halfway round the world, and was found to be still working accurately.

Geographic North is stationary, a point on a map, but Magnetic North wanders constantly. Fox's dip needle was a survey instrument which could locate Magnetic North, allowing ships' compasses and charts to be adjusted accordingly. Since it was robust, accurate, and could take readings at sea, Fox dip needles became the Royal Navy standard for on-board magnetic observations, and would be carried on a series of daring voyages of discovery around the world in what came to be called the Magnetic Crusade. In 1845 a Fox needle was onboard Sir John Franklin's disastrous expedition to discover the Northwest Passage. Both ships were trapped in the ice and sank, so somewhere in the icy Arctic waters, a needle still rests, awaiting discovery.

Victorian Britain was in the mechanical age. Brunel would build railways, steamships, bridges, tunnels, and that beautiful viaduct over the Carnon. Six million people would visit Paxton's Crystal Palace and marvel at the 14,000 exhibits – one of which was a Perran beam engine.



The Crystal Palace

New industrial inventions such as Watt's improved steam engine were being produced and installed at remarkable speed. The mines in Cornwall were demanding more powerful machinery and more efficient methods of treating the ore. It was inevitable that some organisation would soon emerge to promote the new inventions the county needed.

What is surprising is that in 1832 the first steps were taken by two young girls, Robert Were Fox's daughters.



Anna Maria Fox



Caroline Fox

Anna Maria was seventeen, Caroline was thirteen. It was Anna Maria's original idea that was defined by her cousin, Wilson Lloyd Fox:

'A new society was originated at the suggestion of Miss Fox of Penjerrick, who was anxious to encourage a number of clever workmen who were then employed in Perran Foundry and who were constantly bringing models and inventions to her father for his inspection.'

These draftsmen may have been some of those clever workmen who sparked the new Society into life: in Anna Maria's words: *'to promote the useful and fine arts, and to encourage industry'*.

Considering what the Society has become today, it's interesting that she mentioned the arts before the industry. She was a gifted amateur artist herself.



Draftsmen at Perran Foundry

It was Robert Were's support that ensured the new society would be formed. This was his opening statement:

First Prospectus of the Falmouth Polytechnic Society, in the Spring of 1832

The object of this Society, is the encouragement of the arts, and particularly of any new & useful inventions. An exhibition to be held once a year (in the autumn) when prizes will be awarded under the following heads...

and it goes on to list the multitude of things to be shown in those annual exhibitions:

Machines, Instruments, Models, Paintings & Drawings, Maps, Charts, Japaning, Inlaying, Stuffed Birds & Insects, Artificial flowers & fruit, Fancy work.

It already sounds to like an arts centre in the making, but always concentrating on the *'new & useful inventions'*.

The exhibitions were the true reason for the Society's existence, and it was the cash rewards and prize medals – bronze, silver, and even a very rare gold – that would make them competitive and popular. For most of the 19th century, the annual exhibition would be the only activity held in the Polytechnic Hall – the house of inventions.

To get things started, in December 1833 a meeting of subscribers drew up a set of rules, and influential people were approached by the family for their support. The provisional Committee of 30 members lived in Falmouth, and 10 were ladies, including Anna Maria and Caroline. The presence of ladies on the Committee was in contrast to the other two county scientific societies, and was the result of the way the Society had grown from family contact.

The original plan had been to call it the Falmouth Polytechnic Society, but the committee decided that its influence should reach not just Falmouth, but the whole of Cornwall.

It was Caroline who proposed the name 'Polytechnic' (a word that certainly includes the fine arts) and in a few years, a number of other societies in England would be using the word for themselves. However, Falmouth was the home of the first Polytechnic in England, and is now the last.

The committee invited Francis Basset, Lord de Dunstanville, who was married to Sir Charles Lemon's sister Harriet, to become the Society's Patron. He died only two years later, when William IV accepted the role, and granted the Society his Patronage. The Royal Cornwall Polytechnic Society was born.

Sir Charles Lemon of Carclew was the obvious choice for President. His family's fortune had been founded by his great grandfather, 'the great' Mr. Lemon, one of the founders of the County Adit. Sir Charles would remain President for 34 years, until just before his death. He said, "*Miss Fox was the mother of the Polytechnic, I was its foster mother*" – though it might be more fitting to say, its fairy godmother. Sir Charles's influence and generosity and lifelong loyalty were vital to the Poly's survival.



First President - Sir Charles Lemon

It did survive, and in 1833 Cornwall had a new society, with a well-defined purpose and an inventive, energetic family as its first volunteers. It hadn't yet held an exhibition, it had no building to hold one in, no funds except the subscription which varied between five shillings and a pound, except for Lord de Dunstanville who donated two pounds, and some very generous supporters.



First concept for a Polytechnic Hall

But within two years the Polytechnic Hall would be built, the first exhibitions drawing crowds of spectators, membership from Launceston to Penzance would stand at over four hundred, and things looked very promising.

So if Anna Maria and Caroline could have known that, nearly two centuries later, their creation would still be operating, and as an Arts Centre called The Poly, they might have looked at each other, smiled, bumped elbows, and murmured, “Proper job.”

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John Burrow images

Point Smelting Works, 1857

Devoran & Neighbourhood

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Plaque to be mounted at R. W. Fox’s house, Rosehill, Falmouth

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