THE TREVITHICK SOCIETY

KOWETHAS TREVITHICK

NEWSLETTER 188 SUMMER 2020

Wheal Martha Whim Luckett scrapped 1936-7. H.G. Ordish

Reg. Charity No. 1,159,639

NEW MEMBERS

The Society gives a very warm welcome to the following new members and looks forward to meeting them at any Society events:

Robin Daniel	Saltash
Peter Doney	Saltash
John Dowse	Bradford
Doug Evans	St Breward
Alistair Jeffery	Redruth
Michael Smith	Looe
Lynne Mayers	Taunton

DECEASED MEMBERS

The Society is saddened to report the passing of the following members:

Roy Berry	Sudbury
Keith Matthew	Helston
Alan Richards	Hornchurch

Our condolences to their families.

EDITORIAL

The summer issue of the newsletter is normally the easiest to compile having recently had Trevithick Day and the Society AGM to report. Not surprisingly these were cancelled together with the W.E.S.E.S. Rally and the long list of summer walks and talks advertised in the last newsletter. As a result I thought I would really struggle to get enough content to prepare this newsletter. Thankfully, various members have made up the shortfall by writing interesting articles.

The last newsletter had to be issued early due to the AGM date which was two weeks earlier than normal. Unfortunately, the Levant Report which arrived in time for the published copy date was too late to appear in the newsletter. The other unforeseen factor was the Coronavirus as the lockdown came a week after the newsletter, with details of the AGM, having been sent out to members. This meant that all members had to be contacted again to inform them of the cancellation of the AGM. This in turn proved to be much more difficult than usual as our ultra efficient Membership Secretary, Sheila Saunders, was on holiday. In her absence, Kingsley, Sonia and myself had to use a spreadsheet of membership details which was not only a few months out of date but also one with which we were largely unfamiliar. There ensued more than a few fraught moments!

The Puffing Devil had the first part of its ten year boiler test completed, as reported in the last newsletter. The second part - the hydraulic and steam test - was cancelled due to Coronavirus. Hopefully, we will not have to repeat part one of the test when normality returns - presumably next year.

CNF

Copy date for next newsletter:

September 15th 2020

TM

Established 1935

LETTER TO THE EDITOR

Dear Editor,

I don't know if anyone else has pointed out that the photograph of the Holman Zitair compressor, on page 6 of the last newsletter, was taken in Brussels! In the background, is the Atomium: built for Expo58.

Rod Thompson

Dear Editor,

I always enjoy receiving the Newsletter with all its interesting snippets of information and news. I do appreciate all the effort that goes into producing it.

On page 6 of the last Newsletter there are two interesting photos of "Road works as they used to be." But what is even more fascinating about the photo of the Holman Zitair Compressor is that it is being used in Brussels, Belgium with the iconic Brussels Atomium in the background. This was originally built for the 1958 Brussels World Expo. It represents an iron crystal magnified 165 billion times and consists of nine 18m diameter spheres, six of which are accessed by internal escalators in the connections. The structure was intended to last just 6 months, but I visited it in 1985. In the 1958 Expo the six accessible spheres housed an exhibition of the achievements of science and industry of that time: by 1985 it seemed to have become an exhibition of historic developments of science and industry, but it is reported to have been renovated and updated in 2004 – 2006. Until 2016 the image of the Atomium was copyright and it was forbidden to reproduce and distribute it in any form of publication without formal permission. Now I think you are safe from prosecution!

Michael Thorn

Dear Editor,

I read your editorial in Newsletter 187 with interest. I thought I would email you as I am one of your predecessors!

You are quite right that the Newsletters started formally in May 1973 and I am sure the Society has copies of all of them all. Jim Hodge was the first editor and did so from May 1973 to February 1975, I think, when I took over. I was a young twenty something with no experience of doing that kind of thing and, looking back, I think I did it rather poorly. My only consolation is that no one else wanted to do it at the time! I had been co-opted onto Trevithick Society Council and felt like a dwarf among giants with names like Jim Hodge, Frank Booker, Justin Brooke, Joff Bullen, Rodney Law, A K Hamilton Jenkin, Bice Mitchell, Dicon Nance and Jack Trounson. I think that, again looking back, it was actually an enormous privilege.

I was editor until May or perhaps August 1980. I worked for English China Clays at the time and they asked me to move to Oxfordshire which I did in September 1980. Being a Cornish boy born and bread this was quite a wrench and my way of dealing with the move was to sever all links with my industrial archaeology interest in Cornwall, hence my resignation as editor. Kenneth Brown took over and did a much better job.

Unfortunately I never met him. I assume that Martin Beckett took over from him. I remained a Society member until about 1985 when I let my membership lapse. I joined again only last year.

I used to paste the articles onto a sheet of A4 paper in the correct order. My wife used to type out hand written manuscripts and my notes which joined the whole thing up. I used to send or deliver the pasted pages together as a draft to printers in Penzance who then produced the Newsletter.

Colin Yelland

THE LIFE OF WILLIAM NICHOLSON (1753-1815)

The Life of William Nicholson (1753-1815): A Memoir of Enlightenment, Commerce, Politics, Arts and Science. By Sue Durrell. Paperback, 176 pages. Peter Owen Publishers. Price £14.99.

William Nicholson (1753-1815) is best known to Enlightenment historians as the founder of *A Journal of Natural Philosophy, Chemistry and the Arts* – the first commercial monthly scientific journal in Britain. Taking a wide variety of articles from all levels of society, Nicholson's Journal, democratised access to technological developments, encouraged debate and accelerated the spread of scientific know-how.

Nicholson was also an inventor, and he is responsible for the cylindrical printing press which he patented in 1790, a hydrometer, the revolving doubler, a file cutting machine and a scale rule. He registered four patents in his own name, and practised as one of the earliest patent agents, initially from his home in Red Lion Square and later from 10 Soho Square where he also established a scientific school.

Richard Trevithick was among Nicholson's consultees, having been introduced by Humphry Davy, as noted in a letter of 16 January 1802 to Davies Giddy:

Mr. Davy says that a Mr Nicholson, he thinks, will be a proper person to assist us in taking out the patent, and we are to be introduced to him tomorrow, and then shall immediately proceed with the business.

On 23 March 1802, in describing the patent process for GB 2599/1802 Construction of Steam Engines; application thereof for driving carriages and for other purposes, Trevithick noted:

… Of course I immediately repaired to Crane Court, where I was informed that the patent was to be sealed on Wednesday (to-morrow); and that they did not know whether the specification must be lodged on to-day, or a month from the sealing. They recommended me to Mr Davy at the Rolls Chapel Office, for information, where I immediately repaired, but I could not find the gentleman. From there, I shaped my course to Soho Square, and spent two or three hours with Mr Nicholson: had the necessary alterations made in the rough copy of the specification.

Trevithick maintained contact with Nicholson, sending him two papers for publication in his Journal in 1802:

- Description of an Engine which operates by the Pressure and Descent of a Column of Water against a Piston; nearly in the same Manner as the Double Steam Engine operates by Means of Steam. March 1802; and
- Method of applying a temporary Forcer to a Pump, so as to produce a constant Stream. July 1802.

2018 finally sees the first publication of The Life of William Nicholson, written 150 years ago by his son, also called William, and edited by Sue Durrell.

There is much in this memoir that will be of interest to historians of literature, commerce and inventions, as well as to historians of science and the Enlightenment. Frank L. James of UCL and the Royal Institution has contributed the Afterword 'Locating William Nicholson' placing Nicholson's 'critically important contributions' in the context of revolutionary Enlightenment – positing one theory why Nicholson was never made a fellow of the Royal Society.

A full list of Nicholson's publications and inventions can be found in The Life of William Nicholson, by his Son, (£13.99). Free postage and packing is offered to members of the Trevithick Society when purchasing direct from www.PeterOwen.com. Simply use the Coupon code '1753-1815' in the shopping cart before proceeding to checkout.

For more information on William Nicholson, see:

www.NicholsonsJournal.com

or follow him on Twitter @Wm_Nicholson.

Sue Durrell has edited *The Life of William Nicholson, 1753–1815*, a memoir originally written by his son in 1868 and held at the Bodleian Library. She is currently writing the first contemporary full-length biography of William Nicholson and is trying to complete her set of Nicholson's Journal.

MINERALS COURSE

For self-isolating members with sixteen hours to spare here is a constructive suggestion:

Critical Minerals Assoc (CMA) Q&A Session - 'Technology Metals for a Green Future': Camborne School of Mines - FREE 16-hour course via web!

https://www.criticalmineral.org/post/q-a-session-3-technology-metals-for-a-green-future-camborne-school-of-mines

TREVITHICK IN BURUNDI

Trevithick makes an appearance in lots of unusual places. Perhaps one of the least expected is on a stamp from Burundi.

MYSTERY OBJECT

I wondered whether Society members might be able to help me identify this granite object (see photo below) that I found at my house at Ding Dong near Penzance.

I found it at a depth of about 18 inches while digging a new vegetable patch. It is a symmetrical shape and weighs around 0.75 pounds. It is clearly man-made. I wonder whether it could be a tool of some kind used in the nearby tin mines or stamps? Or perhaps it is much older (bearing in mind the many Bronze Age and Iron Age sites in the area)?

Any thoughts or ideas would be gratefully received. Many thanks for your help.

Martin Winn
martinjwinn@gmail.com

Initial thoughts: Obviously for weighting the end of a line, but why? It looks like a weight but appears too small for mining purposes. Perhaps it is a weight used in the cataracts of a single acting engine.

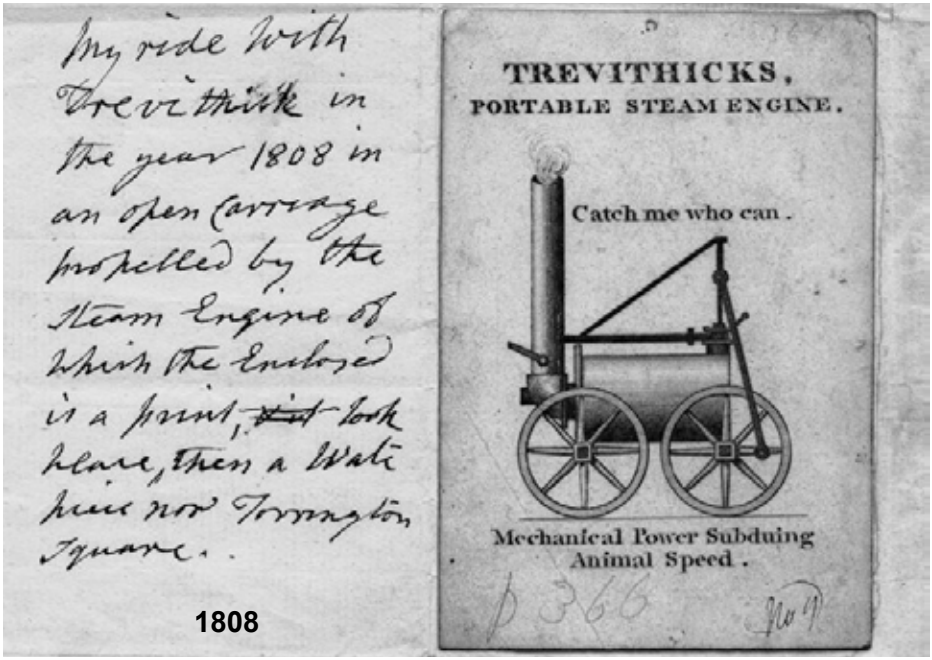
WHAT HAPPENED TO THE PENYDARREN LOCOMOTIVE

What ever happened to Trevithick's Penydarren locomotive?

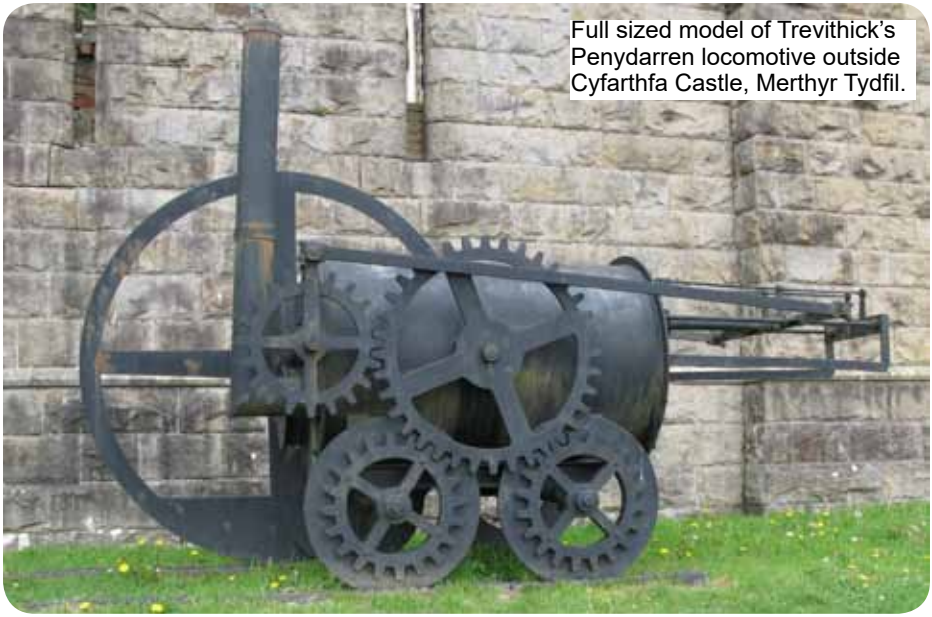
In 1803, Richard Trevithick was invited to Penydarren ironworks in Merthyr Tydfil, South Wales by the owner, Samuel Homfray, to build stationary steam engines using high pressure steam (15-22psi). Homfray had bought shares in Trevithick's patent.

In 1802, Homfray had laid nine miles of horse drawn tramway from his works to the Glamorganshire Canal to avoid congestion at the canal's northern end. Around this time Trevithick had been building a steam locomotive for William Reynolds of Coalbrookdale, Shropshire, but this had not been tested on a realistic length of track. As far as we can tell, this locomotive was never completed. Drawings, previously thought to be of the Penydarren locomotive, held in the National Railway Museum, York, are probably for an engine never built, but intended for the Tredegar – Newport tramway, laid by Homfray around 1793. The drawing shows a locomotive of 3' gauge – the same as for Tredegar – whereas the gauge of the Penydarren tramway was 4' 4".

In Cornwall, Trevithick had successfully built the steam powered road engine, Puffing Devil, in 1801, so Homfray set him the task of building a steam locomotive to run on his Penydarren track. It is speculated that this was to be a conversion of one of Trevithick's stationary engines already in operation at the works. Homfray wagered a bet of 500 guineas with rival ironmaster, Richard Crawshay, the owner of the nearby Cyfarthfa works, which controlled the northern end of the Glamorganshire Canal. Richard Hill, of Merthyr's Plymouth works, was to act as overseer. The bet stipulated that the engine could not haul 10 tons of iron along the nine miles of track and return with the empty waggons.



Ticket illustrating Trevithick's 1808 locomotive 'Catch me who can'



Full sized model of Trevithick's Penydarren locomotive outside Cyfarthfa Castle, Merthyr Tydfil.

On 21 February 1804, all was ready and, in Trevithick's own words:

"...yesterday we proceeded on our journey with the engine, and we carried ten tons of iron in five wagons, and seventy men riding on them the whole of the journey... the engine, while working, went nearly five miles an hour; there was no water put into the boiler from the time we started until our journey's end... the coal consumed was two hundredweight".

Sadly, the achievement of being the first ever steam traction railway was eclipsed by two mishaps; the breaking of many of the cast iron tramway rails due to the weight of the locomotive, and, on the return journey, a break-down that delayed completion of the run.

This, and the need to realign the track as it passed through a short tunnel with 8' clearance – an obstacle which had dictated the maximum size of the flywheel on the locomotive - gave Crawshay an excuse not to honour the wager – valued at £51,660 today!

After a number of further mechanical and track mishaps on later journeys, the wheels were removed and the engine converted into a stationary engine, initially driving a forge hammer at the works and later relocated several times to winch trucks up inclines at nearby coal mines. It was eventually scrapped around 1859, by which time it is believed that only the cylinder and piston remained original parts.

Trevithick built two further locomotives, one at Gateshead in 1805 for the Wylam Colliery, but that again proved destructive of track, and in his final attempt in 1808, built the 'Catch me who can' locomotive at Bridgnorth, Shropshire. He demonstrated it in London for a shilling a ride on a circular track set up in Torrington Square (near present day Euston Station) where it reached 12mph, but again, a broken track caused a derailment and ending the demonstrations. The locomotive, which is depicted on the entry ticket, looks more akin to his earlier road engine without the large flywheel and 'trombone' piston gear.

Trevithick was ahead of his time, leaving it to George and Robert Stephenson, who, in 1822, 14 years after the Penydarren run, ran the first steam engine to haul goods on the 8-mile Hetton colliery railway. This was

followed in 1825 by the first passenger service on the 25 mile long Stockton and Darlington Railway. Ironically, this revival of steam locomotion was successful as wrought iron rails, made by a competitor to Penydarren, Dowlais ironworks of Merthyr, were used instead of cast iron and did not break under the weight of the locomotive. This opened up a vast market for the manufacture of wrought iron rails, with rails supplied throughout UK and across the world by the Merthyr ironworks, a market that persisted until Bessemer came along with steel rails in 1858, first manufactured at Dowlais, the first ironworks in UK to operate Bessemer's patent.

In a further turn of irony, in 1829, Homfray's son (also Samuel) bought a Stephenson locomotive for the Tredegar tramway – just four years after the opening of the Stockton and Darlington Railway, and rode on it to Newport.

An explosion of a Trevithick engine at the Penydarren works on Thursday 8 May 1834, reported in The Glamorgan, Monmouth & Brecon Gazette & Merthyr Guardian of 10 May, was not that of the converted locomotive, but of another engine either built by Trevithick or by a licensee of his patent. The report highlights the danger of high pressure steam:

1834 'Accident, with Loss of Life, at Penydarren Iron Works.— On Thursday afternoon, the tube of the Trevithick steam engine burst with a loud explosion, threw down in large fragments great parts of the cylinders of the engine, scattered in all directions the roofs of several buildings belonging to the works, and shook a considerable number of the houses around. We deem it a most providential circumstance that, on a spot on which generally many persons are present, only two were seriously injured. These were at work in a shed adjacent, the roof of which, made of iron, fell upon them, and they were taken out dreadfully scalded, and nearly in a state of suffocation. One of them expired on Friday morning.

In 1981-2, the National Waterfront Museum in Swansea built a working replica of Trevithick's engine and ran it on a short length of track.

A preliminary assessment of design parameters was undertaken by CompAir Ltd of Camborne, Cornwall in 1978, and a full set of detailed preliminary design drawings were prepared by Locomotion Enterprises of Gateshead. Three dozen South Wales engineering firms and foundries manufactured major components (some as apprentice training projects) and provided materials. Smaller components were manufactured in the Museum workshops. The locomotive was assembled at the Museum workshops and replica tram-road track laid. The locomotive weighs six tonnes exclusive of one tonne of boiler water.

It is still demonstrated in steam about three times a year, dates announced on the Museum's web site. A brief history – in need of some correction – of the locomotive and an 8-minute video of preparing and running the engine can be viewed at:

https://museum.wales/articles/2008-12-15/Richard-Trevithicks-steam-locomotive/

Anyone who wishes to have more details of the locomotive's design from a publication provided by the Museum please contact me at secretary@wealdenironresearchgroup.org.uk

Tim Smith

LEVANT REPORT

Due to the current lockdown Levant is currently closed, (as are all National Trust properties), although by the time this is published things may have changed! (We live in hope....).

So although there are no activities to report this quarter, the following is a report from earlier this year which failed to make it into the Spring Newsletter:

As I write this it is early March, the NT staff and volunteers are gearing up for the new season at Levant. The winter months have seen much activity around the site, particularly in the engine house. John Woodward will be documenting in detail the work that he has carried out on the engine in the next few issues of the magazine, but suffice to say (from a layman's point of view) the work has been carried out with skill and expertise, maintaining the integrity of the engine itself and building on the work that has been carried out by dedicated volunteers over many years.

On the subject of volunteers, our team have carried out an enormous amount of work since the site closed at the end of October last year:

- The engine has been completely de-greased and re-painted, and it looks lovely!
- The guarding in the engine room has all been re-painted.
- The launders have been cleared and re-built where necessary, and are now flowing correctly
- The electric winder has had a fresh coat of paint.

Unlike the volunteers in the past, our current team are restricted as to the work that they can carry out due to insurance and legislation, but nevertheless the management came up with a long list of tasks that we were able to carry out and the dedicated team set to with enthusiasm. I won't mention any particular names in this report to avoid embarrassment (!) but you all know who you are and we thank you for all your efforts. There is little doubt that the tradition of volunteering at Levant is alive and well, and set fair for the foreseeable future.

On the downside, the roof supports, in what has traditionally been referred to as the "fan room" have failed, so this building (and its excellent "Bal Maidens" exhibition) is at present closed to the public. Hopefully I will have some positive news on this in the next quarter's report.

Doug Murphy

TREVITHICK PLAQUE

As with the Burundi stamp, Trevithick appears in many unusual places. In the Sunderland Daily Echo & Shipping Gazette of 24/04/1934 it was reported:

Three women descendents of Richard Trevithick, the inventor of the high pressure steam engine - Mrs Trevithick, and the Misses M. and D. Trevithick, of London - were present yesterday when the Hon. Oliver Stanley (Minister of Transport) unveiled a tablet to his memory at University College, London.

The tablet, which is placed on the wall of the Engineering Laboratory, where it can be seen by the public, records the passenger locomotive experiments which Trevithick made in London in 1808.

The exact site of the trials is not known, but it has been narrowed down to within the area on which the University College now stands.

Mr Stanley said it was appropriate that he should be associated with the ceremony, because Trevithick had made discoveries which had a material effect on two branches of the great national industry of road and rail transport.

ROSEVALE MINE DEEP ADIT LEVEL

Over the past 45 years Rosevale Mine has been visited by several thousand people. However, most of these visits have been confined to the main workings and relatively few people have seen the Deep Adit Level.

We believe this is the earliest underground working at the mine and probably dates from the 18th century, if not earlier, as part of a mine named Wheal Chance. The main workings of Wheal Chance lie on a northwest-southeast lode near the top of Trewey Hill. The Deep Adit Level has been driven southwards from its portal in the bottom of the Foage Valley. Near its entrance the Deep Adit Level twists and turns along what appear to be a series of minor crosscourses that run sub-parallel with the valley before it picks up a north-south structure, that for much of its length is little more than a narrow, mineralised stringer. Eventually this structure merges with the Rosevale Main Lode.

There is no documented record of Deep Adit Level apart from an indication on a plan of Rosevale Mine (dated 1914) that shows a '25 feet deep winze' connecting with 'Wheal Chance Deep Adit'. Initially we had assumed that the Deep Adit served to drain the main workings of Wheal Chance, but it runs too far south. Articles in the Mining Journal (circa 1910-1914) indicate that when No.1 Level was being driven in about 1909 it was assumed that the lode being followed was the eastward extension of the Wheal Chance Lode. However, as development progressed it became clear that this was not the case and that the Wheal Chance Lode did not extend into the Foage Valley.

Our discovery of the Deep Adit Level happened in the early 1980s when we decided to clear out an old shaft that

lay on the hillside about 200 yards to the north of the main workings at Rosevale. At this time the shaft was totally choked at a depth of 15 metres. We rigged-up a tripod and small hand winch and started to clear the shaft. Eventually we broke into the top of a tunnel at a depth of about 20 metres. We continued to clear out the shaft to its base and completely opened-up access into the tunnel. The tunnel was narrow and conducted only a small flow of water. Downstream from the shaft the tunnel was approximately 1.5-1.6 metres high by 0.7-0.8 metres wide with smooth hand-picked sides and roof. Upstream of the shaft it appeared that the tunnel had been slashed out and heightened to 1.8 metres.

The Deep Adit was in remarkably good condition and we were able to follow it for a distance of 150 metres to a complete blockage of fine kaolinized granite, with water seeping out from the roof of the pile. We had also discovered a partially blocked and flooded winze or stope at the back of No.2 Level, just beyond the intersection of the Rosevale

Main Lode with the structure along which Deep Adit Level had been driven. We were certain that this winze/stope must connect with Deep Adit Level at a depth of about 9 metres, but it was inaccessible. This meant that there was likely to be a 9 metres head of water behind the blockage.

We left this situation alone, until the mid-1990s when we took the decision to clear the blockage by driving a 20 metres long crosscut tunnel from No.2 Level and sinking a winze 9 metres to connect with the Deep Adit Level at the blockage. This led to an eight-year project involving drilling and blasting and the removal by hand of over 150 tons of rock. We successfully intersected the adit and by the late 2000s we had completely cleared the blockage. Not only did this enable easy access into Deep Adit, it also facilitated ventilation. This added a whole new dimension to the mine, but for us it had been a huge and costly undertaking.

Unfortunately, several metres upstream of the new winze there we encountered another complete blockage in Deep Adit, with water pouring out of it. We believe this blockage may be the base of a back-filled winze or stope from No.1 Level (which lies over 35 metres above). We started to clear this blockage a few years ago, but the work is difficult due to the very restrictive size of the tunnel and poor ventilation. So, at present we have put this work on-hold.

It is now evident what a serious enterprise the Deep Adit Level must have been when it was driven. It is over 200 metres long from the access shaft on the hillside, driven by hand and with no other shafts or stoping along its course. The amount of water conducted along the adit is not indicative of a connection to extensive workings. So, it is possible that Deep Adit Level ends at its connection below the back of No.2 Level, or it may continue southwards to intersect an unnamed lode that has been proven at surface, but which does not appear to have been mined underground. Even after all of this we still do not know its true purpose.

Tony Bennett

MEMBERS' BENEFITS

Trevithick Society members are entitled to free entry (on production of the membership card) to the following attractions:

- King Edward Mine
- Cornish Engines at Pool (East Pool Mine and Michell's Whim)
- Levant
- Geevor Museum
- Poldark – free entry to site and reduced fee for underground mine tour

Also:

- 10% off book purchases at Tormark.
- 10% off purchases at KEM shop.

THE FORGOTTEN MINE OF THE TIN COAST

There exists a mining area of the Tin Coast, which is missing in the current publications about the Tin Coast. This area which is largely lost to the Bracken and Heather deserves a resurrection. It lies between Pendeen Watch and Geevor. Indeed, a half-covered signpost on the SW Coast path, just past Geevor towards Pendeen light will point the traveller toward it. However this path is seldom trod - mores the pity - because it really deserves a look.

The area is known as North Boscaswell Mine and consists of the mining setts of Boscaswell Downs, Boscaswell Cliffs, Trease, Wheal Powle, Boscaswell United and Pendeen Consuls and was worked by a company known as the North Boscaswell Mining Company.

The mine was worked from two principal shafts: New Trease and Treweeks, to the south of Trease. The National Trust used to conduct paying customers on tours of the sett, principally to Trease, but alas no more, which is a pity, for the buildings that are left house several interesting and unique mining relics which are probably not known elsewhere in the world. These are the remains of a Merton Calciner, a Californian stamps Mill with Pinder tables and two Vertical Cochran Boilers. Such boilers are rare in the workings of Cornish Mines.

The first mining of this area took place on the outcrops of the valley running down from Boscaswell Higher Downs through Calartha Farm to the sea at Mill Zawn. There is documented evidence of working alluvial deposits called Wheal Bill (For Bill the most likely reading is Bal) and Lower Bridge as early as 1508 and later Wheal Boscaswell in 1782. It is noted that a number of minor undertakings on the cliffs at this time were being worked. It seems that the outcrop of lodes in the area generated a plethora of small enterprises collectively known as Wheal Carne in the 16th Century. So mines such as Wheal Zandras, Wheal Powell and The Bill were the early workings on the North Eastern side of Boscaswell Downs, whose lodes were discovered as a result of streaming the valley bottoms. This then was the foundation of the Boscaswell Mines setts.

The documented history of the Boscaswell mines begins in the 1770s when Wheal Bill (Bal?) was being worked to shallow depths mainly into the cliff.

By 1815 the mine had acquired a Boulton and Watt 36 inch steam engine, one of the largest and earliest on the Tin Coast (West Briton Newspaper 24/3/1815) which also worked Wheal Pawle.

The mine then opened as Boscaswell Downs in 1820 and this phase of working this sett lasted until 1857 and during this time the 36 inch engine was replaced with a 27 inch pumping engine (1841), two steam Whims, a Stamps engine and two large water wheels. This would seem to imply that the mine was doing good business but not so, for at the same time the mine was described by Mining Captains Tredinnick and Clems of Balleswidden as “an extremely poor example of pitwork”.

These comments were prophetic for by 1857 the whole mine was up for sale with all its machinery, as it was producing little ore of value.

However the mine was reopened shortly after this with an extra 36 inch pumping engine installed and by the middle of 1867, ten years later, was employing 150 persons.

However cash flow was still a problem for the mine and in 1866 it was once again for sale.

But the mine still appeared a good prospect according to Captain Henry Boyns of Botallack and he is quoted as believing it contained some of the best tin in the district. (Noall 1973 - page 43). Still, under somewhat dubious circumstances, the mine was wound up in 1872.

It seems that cash and investment was always an ongoing problem for the workings and the Cost Book business model of operation was almost guaranteed to produce “Boom and Bust” conditions. (i.e. no money from profit was put aside for the bad times). This unfortunately

is the story of Cornish Mining, which is why Levant is so fortunate for it was rich enough to keep in profit even in the bad times.

The mine rose again as the Boscaswell Downs Tin and Copper Mining Association, in 1873, when a rich new copper lode was found in the Eastern part of the sett (nearest to Pendeen Watch). This legislated for an increase of workload such that 350 persons were then employed.

Strangely though this mine was again dogged by poor luck, poor management and poor returns.

Captain Josiah Thomas of Dolcoath, on inspecting the mine, thought it was near to being worked out and in poor condition underground. His comments throw some light on why the mine performed badly because "poor condition" was a euphemism for a lack of expenditure by the company and its shareholders to improve underground working conditions. As a result much ore production was lost. Indeed a Mr Albert Milstead, one of the chief promoters of the company was accused of fraudulent behaviour by the mine shareholders as costs rose and investment dried up. So by 1874 the mine was again closed.

But, as ever, hope springs eternal in the Cornish breast, and in 1907 the mine was retried as Boscaswell United Tin and Copper Mines Ltd, working all the aforementioned setts i.e. North Boscaswell, Pendeen Consols, Trease, Calartha Farm, Boscaswell Downs, Calartha Common, Portheras and Wheal Caroline.

However, again because of appalling management, the mine was thrown into the Stannary court and had closed by the outbreak of the Great War in 1914.

But again this was not the end. For the sett was acquired by Geevor and worked from Treweeks shaft and ore was produced. Unfortunately when Geevor closed so did Boscaswell.

So now we are left with the old abandoned buildings. But go and look at them. If you have an interest in the Tin Coast you won't be disappointed.

The Merton Calciner is one of the few calciners in existence which boast twin dust chambers to catch the arsenical output produced by "cooking" tin; as opposed to the Labyrinth's prevalent at the other sites on the Tin Coast. It is easy to spot as the walls of the existing building still show signs of smoke stains and the flues, which took away the condensing smoke, are obvious.

These dust chambers are really unique because of their size and shape. To shovel arsenic from these chambers must have been a whole new experience!

The Buddles and the site of the unusual Record and Pinder tables still exist in what is a compact and easily interpreted tin mill. In fact the mill site lends itself to easy explanation because the whole process of tin and arsenic production can be gleaned from a very small area of ground.

The stamps can still be seen and in conjunction with the mill the site of the two vertical boilers can be ascertained and interpretation of how they provided steam to the engines gleaned. But don't expect any information boards. None have ever been provided.

Last but not least, attempts were made to re-start the mine in 1922, but it was soon suspended and remained so until 1927 when the company was finally wound up, and the machinery was sold for scrap. The buildings were also demolished to recover anything re-useable.

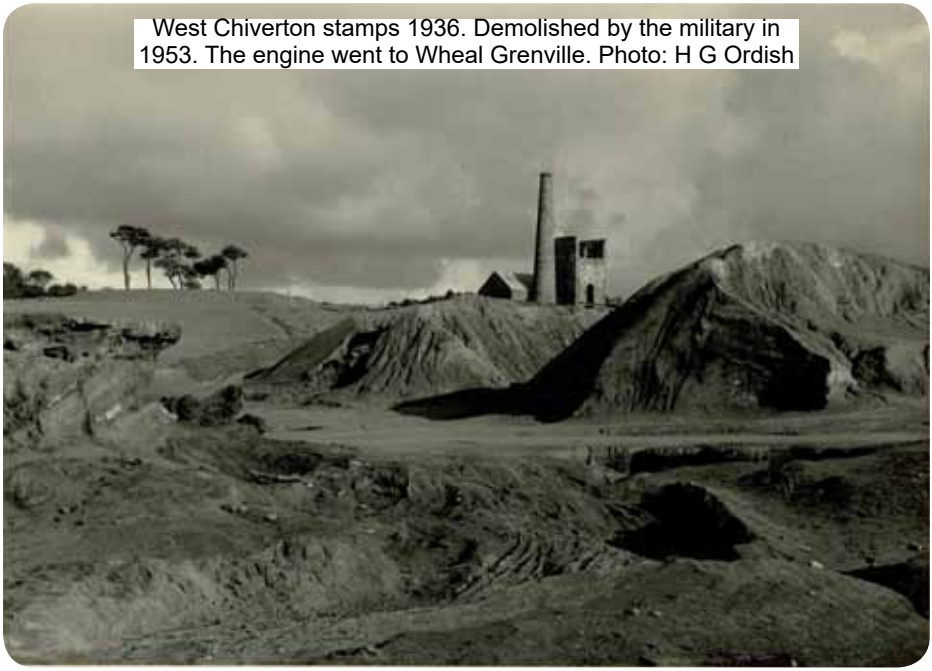
Geevor took over the sett in 1937 and worked the lodes from the 1960s until the late 1980s.

But as a remnant of the Tin Coast the site is evocative, historic and very user friendly. Don't miss it. Better still ask me to give you a tour!

Len Phillips

REFERENCE

Noall, C. (1973). *The St Just Mining District.* D.B. Barton, Truro.



West Chiverton stamps 1936. Demolished by the military in 1953. The engine went to Wheal Grenville. Photo: H G Ordish

The photograph below was sent in by Sally Foster. It shows a gathering of the Mining Institute 1915/16. Her grandfather Cornish C.T. Millett is 3rd from the left - sitting. He re-equipped and reworked Worvas Downs Mine 1904-1909.

NEW STEAM MAIN PART 1

The Levant whim's high-pressure steam main dates back to its restoration in 1990. A new larger boiler was fitted in 2011 but the original pipe work was retained.

The design took a long and meandering root from the boiler to the engine and included 3.25 metres of 2-inch diameter and 7.6 metres of 4-inch diameter pipe. The 4-inch pipe is thought to have been included to provide additional steam capacity. This may have been required because the original boiler was quite small. It could have been struggling on the first two strokes of the engine starting prior to the condenser establishing vacuum and the steam consumption dropping.

The negative side of this design is that a substantial quantity of pipe must be heated and kept hot. In addition,when the engine was standing idle, a large amount of steam was cooling and collapsing back into water. Due to the lack of drainage in several places, a large quantity of standing condensate was causing water hammer and corrosion in the pipe. Finally, following comments by both the Boiler Engineer and the Inspector that the design would encourage pulsing, the decision was taken by the National Trust to replace the pipe work during the winter maintenance of 2018/19.

John Woodward

EARLY ENGINE DATABASE

https://coalpitheath.org.uk/engines/

As we arrive at the date which would have marked the start of the 2nd International Early Engines Conference (now postponed to May 2021), we are delighted to be able to share news of a fantastic new research resource, the Early Engine Database – a fully searchable online database of 18th Century engines in the United Kingdom.

Hosted and supported by the Cultural Heritage Institute, as part of their Heritage Knowledge Hub initiative, this new and unique resource contains details of Newcomen, Watt and other steam engines built in the century, and represents the fruits of over forty years of research and investigation by Dr John Kanefsky (University of Exeter).

The Early Engine Database is provided as a resource for researchers in any discipline, industrial sector or geographical area. Anyone is free to use or adapt it to their work, provided the source is acknowledged. This is a collaborative and continually-evolving research project; corrections, updates and additions are warmly welcomed and can be submitted. Access to the raw data is also available on request.

This database is a record of the steam engines constructed in the United Kingdom up to the end of the year 1800. It records only the first erection of each engine, (although what happened to it later is explained in the comments section if known).

Chris Hodrien

THE CURRENT SITUATION

I hope you all have locked down and escaped the worst that the current virus can inflict. We have not received any unfortunate reports other than one member who was admitted to Treliske Hospital for tests for a particular problem and caught the Covid-19 bug whilst there. Fortunately he fought back and is now at home and recovering slowly.

As you will no doubt know all lectures are cancelled until further notice as are field trips. Depending on the pandemic situation we may be able to run some field trips later in the season so keep an eye on the website or ring the Chatline for updates. It was disappointing that we were unable to hold the AGM weekend where we look forward to meeting up with a number of our far flung members. Unfortunately we had no Camborne Trevithick Day again this year and Camborne Show, The Royal Cornwall Show, the West of England Steam Fair and the Great Dorset Steam Fair have all been cancelled.

We are pleased to announce that member Cllr. Bert Biscoe has been elected Mayor of the City of Truro. Bert has worked in the public eye all his life and we wish him every success for his term of office. He is always supportive of what we do in the Society.

KJTR

PUBLICATIONS

I am pleased to report that editorial work on the 2020 Journal is well advanced. Number 47 will be quite a plump fellow with, we hope, something to suit all tastes. Number 48 is also shaping up well.

Looking for some new reading material? We can supply all Society books in print by post to members. A list of all titles currently available can be found on the Society website www.trevithicksociety.info. Contact Kingsley or myself for orders or with any queries.

Although not actively progressing any new titles at present, we do have one or two exciting projects at the early planning stage and are always interested to hear from members with propositions for Journal articles or standalone publications.

Graham Thorne

BOOK REVIEW

Hidden In Plain Sight - A Photographic journey into Cornish Mines. By Claire Wilson. Publisher: Liondog Publications, Falmouth, 2019. Limited signed edition - 200. Price: £35 paperback. 128 pages.

Those bingeing on Poldark box-sets as a lockdown palliative diversion from their severed Spring sojourn to the South-West this Spring, might recall other visual flashback delights - the panoramic vista of the final approach down to Marazion/ Penzance. Looking left, the Middle Earth majesty of St Michael's Mount. But, even more so, for the connoisseurs of subtle minutiae: far away over the Penzance horizon perches the evocative profile of the teasingly kitsch named, Ding Dong Tin Mine.

With an eloquent eye for industrial archaeology's natural beauty, and the resilience of nature, whilst eschewing nostalgic romanticism, Claire Wilson's limited edition, *Hidden In Plain Sight* -'Journey into Cornish Mines', is exactly what it says on the, err - tin.

Within these 123 pages (over sixty photographs if you factor-in many in luscious gate-fold format) - a nuanced, enchanting subterranean jamboree of the photographer's craft cascades forth. Wilson doesn't disappointed her loyal crowdfunders and ensures her work is firmly in the hybrid cannon of post-industrial archaeology/natural history genre - with a tad of mysticism.

Following on a topographical, and teasingly esoteric, internal narrative logic, Wilson neatly sections the book into themes of location, occupation, consequence and, in these disturbing times, incredible Phoenix-like fertility. 'Above' is a shameless exposition of the ubiquitous, cliff panoramic, sentinel engine-houses whose profiles are continuously reinvented and re-morphed. The witty, minimalist inevitability being the emblematic 'Kernow Rocks' souvenir-badge - a geometric motif engine-house superimposed with the St Piran black and white cross.

'Phoenix - Nature is tenacious,' in close-up intimacy, celebrates insect, fungi

and flora tentatively gaining purchase in environments first used and abused then abandoned by the collapsing industry and consequently despaired over by nearly all but the most patient and optimistic environmentalists and naturalists - But, as they say - Nature finds a way!

'Legacy' might well being sub-titled, the beauty and the bleached, is a candid and brutal, counter-bromide to the post-industrial condescension of tourist-orientated romanticism. Life was damnably hard and short for most (excepting the 'Mineral Lords' who leased-out plots for prospecting 'Adventurers' at no physical or financial risk to themselves excepting the possibility of pannier-bags bloated with coin causing the badly maintained bridges to collapse under the weight of their greed). Notwithstanding - the environmental impact was, and still remains significant.

The toxic legacy of intensive extraction and surface processing is still impacting on many abandoned locations and, even more invidiously, the millions of litres of water that continue to leach into water-courses and estuaries today, and for long into the future, despite major pollution-management interventions. Mining engineers will ever point to the appalling neglect of what was Cornwall's best ever hidden hydrological drainage management complex, The Great County Adit - a masterpiece of subterranean engineering - imagine Rome's arterial aqueducts all connected and then buried upside-down: though certainly non-potable.

Wilson's images of spoil/tailings desolation, evoke comparison to some deranged artist smearing a chaotic ochre pallet across a lunar landscape. Juxtaposed are her close-up studies of fauna and flora steadfastly invading into, often thriving in, those seemingly toxic habitats. Give it up to the bugs and bacteria. Ironic, given that there were periods where the mines earned more from refining the roasted ore by-product - arsenic: exported by the hundreds of tons as a pesticide.

'Hidden' cuts to the chase of the book's teasing theme - what lies beneath? Wilson was as wise as she was fortunate to collaborate with experts and explore locations where she was able to capture cliché-defying exposures. Cathedral apse heights of sentinel straining timber stope supports; labyrinthine tracks now silent, map-out 'trammers' ore wagon-ways

that were wielded from the sinew aching granite by centuries of candlelit miners hewing with pick, shovel and - once upon a time in the blast, an unimaginable time - short-fuse, goose-quills stuffed with explosive black-powder.

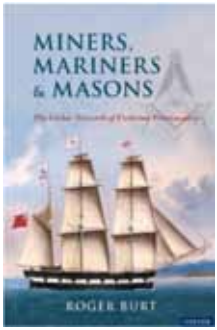
Lyrically, though economically, astute in the expositional text, 'Welcome' - 'Cornwall Is Hollow' Wilson references the many thousands of subterranean/ submarine tunnels, stopes, adits and winzes. A honeycomb tasting less sweet, she emphasises, when it becomes a poisoned chalice: your garden patio suddenly disappearing in to an un-mapped mine-shaft capped only with, now collapsing, rotten timbers.

Thence deep and ever deeper-mining down mind-numbing fathoms into temperatures of 100 degrees and more in to the unforgiving granite belly of a Cornwall aeons ago volcanic born and bathed in geothermal spring depositing ores, minerals and crystals of fairy-tale dazzling beauty. The salvation and bane of Mine Captains, those Brummie metal-bashers, Boulton & Watt, brought fire and steam and, 'Gentlemen - what we have, the World desires: Power!' Cornwall was literally the 'copper-bottomed solution' supplier to the Royal Navy's expansion of the British Empire and the nascent Industrial Revolution. Voyages in to the Pacific saw wooden hulls rapidly compromised by the teredo/ship worm. 'Copperopolis' - Swansea was their swan-song. The rest is history - were soon to be in-numerous indigenous peoples who were about to encounter 'Civilisation'.

Photographer, Claire Wilson, allows us to grasp forever, a momentary shutter's snap-view of weird scenes inside the old mines whose extracted tin and copper were to literally wire the world together through Cornwall's perfectly located router - Porthcurno Cove.

John Kennedy

MINERS, MARINERS & MASONS



Miners, Mariners & Masons. The Global Network of Victorian Freemasonry. University of Exeter Press. By Roger Burt Hardback. Cost £75. 344 pages.

Freemasonry played a major role in the economic and social life of the Victorian era but it has received very little sustained attention by academic historians. General histories of the period hardly notice the subject while detailed studies mainly confine themselves to its origins in the early eighteenth century and its later institutional development. This book is the first sustained and dispassionate study of the role of Freemasonry in everyday social and economic life: why men joined, what it did for them and their families, and how it affected the development of communities and local economies.

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The Trevithick Society, a registered charity, is a recognised body of the study of industrial archaeology in Cornwall. Membership is open to all who are interested in the region's great industrial past, whether or not they live in Cornwall. The Society takes its name from one of Britain's foremost inventors and pioneers of the Industrial Revolution, Richard Trevithick, a Cornishman whose name is inseparable from the development of steam power. This newsletter is published quarterly and, together with the annual journal, is distributed free to members. Letters and contributions are always welcome and should be sent direct to the editor.

The views expressed in this newsletter are those of the authors and not necessarily those of the Trevithick Society.

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