



THE TREVITHICK SOCIETY

KOWETHAS TREVITHICK
NEWSLETTER 189 AUTUMN 2020



The Puffing Devil being filmed for the *Devon and Cornwall* documentary series on Channel 4 whilst Sam Henwood (left) and Sean Oliver (middle) wrestle with one of the more troublesome retaining bolts on the front of the boiler. The engine was being stripped down in readiness for its second ten-year boiler test and the fitting of a blow-down valve.

NEW MEMBERS

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

John and Wendy Dowse	Liskeard
Tim Doney	Delabole
Colin Nunn	Falmouth

In the last newsletter John Dowse was listed as being from Bradford. Apologies.

DECEASED MEMBERS

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

Dennis Jenkin from Woking (member since 1971)

Our condolences to his family.

The Society has also been informed about the deaths of Joff Bullen and John Stengelhofen. Whilst both were lapsed members, they both served on the Council for many years.

Joff Bullen was well known in West Cornwall for all the talks he gave on mining history and wider afield for the books he wrote on the subject which were illustrated by magnificent historic photographs drawn from the Trounson-Bullen mining collection. Joff was also a recipient of the Society's Trevithick medal of which he was very proud.

John Stengelhofen was the Society's first Journal Editor, from 1973 to 1980, and designed the Society's logo, which is still in use.

CORRIGENDA

I wish to point out that I am listed amongst the 'Notes on Contributors' for the recent Trevithick Journal but there has been a mix-up. I am described as John with a stellar academic and teaching career. Sadly, this is nothing to do with me. I am the retired manager of Lloyds Bank in Newquay with a particular interest in Cornish copper mining in the early 19th century.

Jim Lewis

ELECTRONIC COPIES OF THE NEWSLETTER

If any members would like to receive an electronic copy of the newsletter (as a PDF file), it can be emailed to save postage. We quite understand if members wish to keep hard copies.

For electronic copies let Sheila Saunders know by emailing:

membership@trevithicksociety.info

Copy date for next newsletter:

December 15th 2020



Established 1935

LETTERS TO THE EDITOR

Dear Editor,

The following Cornish mining theses may be of interest to members. To access them type the following into your web browser.

<https://ethos.bl.uk/SearchResults.do>

Then enter, in the search box, the uk.bl.ethos.number text in full which is given below the thesis title.

Burke, Gillian Myfanwy. 1981. *The Cornish miner and the Cornish mining industry 1870-1921*. Birkbeck (University of London).

uk.bl.ethos.339388

Orange, H. 2012. *Cornish mining landscapes: public perceptions of industrial archaeology in a post-industrial society*. University College London (University of London).

uk.bl.ethos.587648

Dixon, David Gunthorpe. 1998. *The results and consequences of technical education: an historical case study of metalliferous mining education prior to 1939 with special reference to The Camborne School of Mines and the Royal School of Mines*. University of Southampton.

uk.bl.ethos.266610

Rule, John. 1971. *The labouring miner in Cornwall c. 1740-1870: a study in social history*. University of Warwick.

uk.bl.ethos.471166

Chris Allen

Dear Editor,

I was very interested to read the article by Tim Smith about the Penyardarren Trevithick

locomotive and the wager over the trial run.

I must declare an interest in that Richard Crawshay was my 5x great grandfather on my mother's side of the family.

Mr Smith suggests that Samuel Homfrey made the 500 guinea wager that the engine would not haul 10 tons and return, but I feel sure it was Richard Crawshay who bet against the locomotive, which Homfrey had commissioned. It is hardly likely that Homfrey would have bet against himself.

He goes on to say that the problems encountered during the trial gave Crawshay the excuse not to honour the wager. I have never seen anything to suggest that the wager was not honoured and as Richard Hill of Plymouth ironworks was stakeholder and judge, and presumably acceptable to both parties, I would expect there to be a record if he had not discharged his assignment.

Every account I have seen describes the trial as successful and a letter from Trevithick to Gilbert appears in several accounts saying that the gentleman who made the wager rode with them and was satisfied.

I wonder if there is anything out there to prove otherwise?

Marcus Croome

PS. The weight dug up by Martin Winn looks a bit like those used to tension the warp threads in primitive weaving looms, but could be for anything.



HOW TO MOVE AN ENGINE HOUSE

A trip to New Zealand in 2018 to visit family included a visit to the gold mining sites at Waihi and Karangahaki on the North Island. Waihi has a couple of interesting Cornish connections, one of them, unsurprisingly, being that many Cornishmen worked there. When I visited, the fence around the open pit was displaying commemorative plaques to the many men who had served in World War One. The surnames were overwhelmingly Cornish.



Two Rickards
and a Rice

Waihi has two very prominent features, an enormous open pit – Martha's Pit – and a Cornish engine house, very visible on the hill above the town. It's a big house but not, as more than one person has observed, a particularly beautiful one. It dates from 1903 and its steam engine powered the pumping operation of the underground mine until 1913, when steam was replaced by electricity. The engine house is unusual in two respects. Firstly, the beam was housed on the ground floor with the cylinder above on a mezzanine and the driver positioned on the upper floor. Secondly, the house no longer stands in its original position but at about 296 metres remove from its working location. Any number of Cornish engines found themselves moving site during their lives but usually this involved dismantling the engine and taking down the house. Not so here.

In 1960 the collar of the 1300 feet deep number 5 shaft, from which the engine had pumped, collapsed, leaving the engine house on the brink of a dangerous void. This remained the situation until 1987 when the grant of a new mining license required the all necessary precautions



The open cast pit at Waihi.

The engine house in its new position with artificial shaft on the right and the plateway on the left.



be taken to protect the iconic building. By 2005 the situation, further aggravated by settlement in old workings beneath the house, prompted an expert call to “move it – or lose it”.

To accomplish this, the building was reinforced with three levels of internal steel bracing which replicated the original interior wooden structure; a ‘plateway’ of polished stainless steel plates on concrete beams was laid from the existing location to the new location; the house was cut from its foundation with a very large diamond tipped circular saw; and teflon pads were inserted beneath the building to enable it to slide along the ‘plateway’. The 2000 tonne engine house was then pushed and pulled by hydraulic rams along the 296 metres to its new location. The whole operation lasted from 7 August 2006 to 8 November 2006.

Underground mining ceased at Waihi in 1952, but a rise in the price of gold saw a resumption of mining in 1988 as an open pit operation. Martha’s Pit operated until 2015 when a landslide in the pit put a stop to all activity. At its peak in 1935 Waihi produced 66% of the New Zealand gold output from the low grade gold bearing quartz deposits which had been rendered economic by the development of the cyanide gold recovery

process. By 1952 the mine had produced 174,000 kg of gold and over 1 million kg of silver from almost 12 million tonnes of ore. Mining continued in the Favona, Trio and Correnso underground mines while OceanGold received consent in 2019 to clear the open pit landslip material to reinstate the haul road as an access route for a new underground mine beneath the open pit.

Ted Mole



SOCIETY VACANCY

It is with great regret we have had to accept the resignation of Leonard Phillips from the post of secretary on the Council of Management. Len has had health problems and on medical advice had to relinquish his duties. The post had been vacant for some while prior to Len taking up the position and the Council members had coped with the job but to have a dedicated person makes life much simpler, in particular trying to run a business meeting and write the minutes between thoughts is not good practice.

Len has been a pleasure to work with being articulate, reliable and with a sense of humour. We wish you well for the future Len.

We now therefore have a vacancy and would welcome anyone who feels they can fill the position which is not particularly onerous - the main work being the minutes of the committee meetings. The meetings are held in January, March, May (AGM), July, September and November at Camborne. Being a Cornish organisation we like things to be simple so the meetings are normally held on the Saturday after the second Friday of the appropriate month.

If you can help please contact either Brian Jones or Kingsley Rickard. Neither of us are shy and will talk to anyone!

WANTED

A copy of the *Kalmeter Journal* by Justin Brooke.

I also have a spare copy of *Jenkin's News From Cornwall*, £10 plus postage & packing.

Contact Pete Joseph
info@blindpugh.net

FOR SALE

Copies of the Industrial Railway Record published by the Industrial Railway Society.

The following volumes each contain twelve copies and are bound and in top class condition:

Vol. 5	1973 – 1975
Vol. 6	1975 – 1977
Vol. 7	1977 – 1979
Vol. 8	1979 – 1982
Vol. 9	1982 – 1986
Vol. 10	1986 – 1989
Vol. 11	1989 – 1992
Vol. 12	1992 – 1995
Vol. 13	1995 – 1998
Vol. 14	1998 – 2001

Also bound sets:

Nos. 166 – 177 (Sept 2001 to June 2004)
Nos. 178 – 189 (Sept 2004 to June 2007)

All the above volumes are £30 each, or £320 the lot, postage paid.

First come first served.

Ring Kingsley Rickard on the Society Chatline 01209 716811

CORNISH MINING WORLD HERITAGE SITE

The Cornish Mining World Heritage Site have published a draft management plan. Although the consultation period has now closed the documents may be of interest to members and can be downloaded at:

<https://www.cornwall.gov.uk/environment-and-planning/conservation/world-heritage-site/news/world-heritage-site-draft-management-plan-consultation/>

LEVANT REPORT

Well that's been a strange season! Obviously we were only open for a few weeks before the Covid lockdown was implemented and life became very different.

The final work to complete the winter conservation work on the Levant whim was stopped in its tracks, work ceased on bringing the Miners Dry at East Pool Mine back into use, doors closed to visitors, most staff put on furlough and only a skeleton team have remained working to carry out essential weekly tasks.

As you are no doubt aware Covid has, in common with every other aspect of our lives, hit the National Trust severely and we are having to think long and hard about how we will operate in the future. We do not anticipate a speedy bounce back to normal and we have had to reassess nationally our operational non-pay costs, our project spend and regrettably our wage spend which is going to lead to a large number of redundancies across the Trust. In West Cornwall we are not immune to this and here and across the Trust the next few months will see some heart breaking times as we lose experienced and highly respected colleagues and friends. I'm sure many of you have, in the past, and maybe are now, going through a similar process. It's a tough time and I would ask you to be patient with us as our focus at the moment is very much supporting our staff through this process.

Our work this year has, by definition, been rather restricted but the care of our sites by J.J. and Hannah at East Pool, and by Jak and Ollie at Levant and Tin Coast, has carried on albeit with a different focus. Our conservation work has been focused on managing two of the ten recognised 'agents of deterioration' namely fire and theft or vandalism. At times like these when we are not open as normal, the importance of daily site security checks

and ensuring the maintenance and testing of our fire and intruder alarm systems is of utmost importance and all our sites have received daily attention without fail since March. Managing the behaviours of some of the visitors to the Tin Coast has been challenging with a large number of unauthorised overnight campers and camper vans from July onwards. I won't go into the unpleasant detail of what our team members have had to clear up from the arsenic labyrinth at Botallack and from the engine house at West Wheal Owles. All in a day's work! More recently we have been able to reopen limited toilet facilities at Botallack and Cape Cornwall and the café at Botallack is now open again.

Recent press coverage may have caused you some concern as The Times wrote that only a small number of our places would be reopening which may have caused you to question what may be happening at the relatively small mining sites we care for. As they say, don't believe all you read in the papers. East Pool Mine and Levant may not be big players in terms of visitor numbers but their significance, as part of the Cornish Mining World Heritage site, is immense and we fully intend reopening Levant and East Pool Mine in 2021. There will of course be challenges, not least maintaining social distancing if Covid drags on and it is likely that the shape of our opening arrangements may be different to recent years. As we reach the end of the consultation period it will become clearer what this will mean for our mining sites and we will be sure to let you know how this will impact on the detail of our opening arrangements at Levant and East Pool.

There has, however, been some work looking towards the future, that has included the completion of quinquennial surveys at Levant and East Pool; an assessment of the work required to bring Michell's whim back into working order; recent investigations in Engine Shaft at

Levant to start to assess the feasibility of using heat pump technology and the relative warmth of the water in the flooded shafts, to generate conservation heating for the engine house and winder house at Levant and to maybe even pre-heat the water used to generate steam for the whim.

James Breslin
National Trust

A NEW MINE?

I was fortunate enough to be able to book a holiday and get back to the UK before the world went crazy. This was to a place I had always wanted to go to – Egypt. I would encourage anyone who hasn't been, to go, it really is worthwhile. Aside from a few sites in Cairo (Great Pyramid, The Sphinx, Saqqara and the Museum) we had a leisurely cruise on the Nile. This included Abu Simbel, The Valley of the Kings and Valley of the Queens and the temple at Karnak. On leaving the temple of Luxor I came across the vehicle in the photo; I have not previously been aware of this mine but will add it to the database!

Pete Joseph



THE CURRENT SITUATION

Hopefully you are all Covid free and using your time to investigate your local industrial history having already got the car back to showroom condition, a garden which would put Kew to shame, a newly decorated lounge, completed six months of old paperwork, had a haircut and done a hundred and one other jobs you would not normally have done.

We have had a few queries as to when things will return to normal. Sadly this is a question we cannot answer as the government seems to change the rules we have to live by every other day. As we go to press meetings of over six persons have been banned for the foreseeable future which prevents us providing any sort of programme and with no idea of what decisions to make or when. It is little comfort but all societies covering a whole host of interests are in the same boat.

On a personal note I present twenty or so lectures each winter to Old Cornwall Societies, Women's Institutes, retirement groups, local history groups, Rotarians and others whose programmes have had to be cancelled. I am getting calls enquiring "Will you be doing talks next year?". At this point in time it is impossible to judge and I have every sympathy with programme secretaries including our own hard working incumbent.

As and when the situation improves we will post information on the website.

K.J.T.R.



CORNISH STEAM LAGER

I had the great fortune of spending the pandemic months of 2020 in the magnificent city of Prague as a visiting professor at Charles University. Not only did my wife and I experience the rare pleasure of having the city entirely to ourselves, but the proactive response of the Czech government and the sensible attitude of its people also combined to ensure we came through the crisis quickly, in good health and only mildly inconvenienced.

One of the great perks of a job in the Czech Republic is, of course, the beer, for which the country is both justifiably famous and understandably protective. So imagine my surprise when I discovered a beer (in Tesco, no less) not only named after Cornwall, but also sporting as its logo Trevithick's 1808 "Catch Me Who Can," the world's first locomotive to haul fare-paying passengers. A quick inspection of the rear label revealed this beer to be no import, but one brewed in the Czech Republic by the Žatecký Brewery in Žatec, some 70 miles northeast of Prague. How



was it, I wondered, that Trevithick's 1808 locomotive had become a household label in, of all places, a small town in northeastern Czechia?

The beer, which goes by the name "Cornish Steam Lager," is a rich, unfiltered Bohemian lager made with fragrant Saaz hops (Žatecký poloraný červeňák, vital and sládek) for which the region around their namesake, Žatec, is famous. The strength is given as 12° (about 5%), the Czech degree scale, or stupňovitost, being the weight percentage of sucrose in solution prior to fermentation (akin to original gravity). Although there is nothing very Cornish in this description, I surmised the link to Trevithick presumably came from its description as a steam lager. Traditionally, steam beers, were rather poor-quality 19th century American lagers fermented without the use of refrigeration. This is, fortunately, no longer the case and the name today, made famous by San Francisco's "Anchor Steam," refers simply



to a style of crisp but full-bodied lagers that fall into a category known as California Common.

The Cornish connection was apparent from the label's reference to Wooden Hand Brewery, a now-closed (I believe) Grampound Road microbrewery founded in 2004 and named after the articulated prosthesis of John Carew of Penwarne who lost his real hand at the Siege of Ostend in 1601. Cornish Steam Lager was originally one of the brewery's line of craft beer, and the Czech version, which doubtless differs from the original, was reputedly a co-operative creation between the brewers at Wooden Hand and the Žatec Brewery. It is likely that this synergy was facilitated by Rolf Munding, a Swedish businessman who is said to have initially run Wooden Hand and also owned the Žatec Brewery.

Doubtless, there are some among our membership who know the facts of this curious story, but if what I have gleaned is true, it is an ironic twist of fate that a beer, created and brewed in Cornwall with our eponym's engine as its logo, is now available only in the Czech Republic!

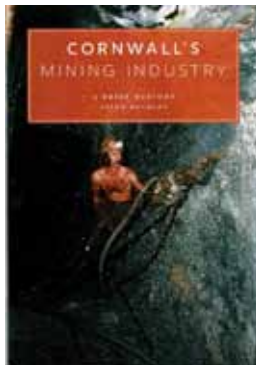
Damian Nance

SOCIETY WEBSITE

The revised Society website is up and running. I recently decided to add a resources page and have now added Alastair Neil's newspaper index, the 2010 AIA illustrated programme and all of the Society illustrated AGM programme notes. Other material will be added directly; if you have anything you feel could be added, please let me know. Also, if you fancy trying your hand at being webmaster, please let me know.

Pete Joseph

BOOK REVIEW



Cornwall's Mining Industry. A Brief History by Allen Buckley. Third Edition, 2020. Tor Mark. 48pp. £4.99

The extraction of metalliferous minerals from Cornwall began in the Early Bronze age and continued pretty well unabated until almost the present century. In terms of longevity the extraction of tin dominated the industry whilst copper mining took over that mantle for much of the eighteenth century up until the mid 1860s.

To summarise such an industry over all those millennia in a relatively few pages is a daunting task. Remarkably Allen Buckley manages to neatly precis many of the key events and technological changes, with all its twists and turns in response to ever changing macro-economic conditions. In so doing he charts the history of the industry, in chronological order, from its early history to prospects for the future. Along the way, some of the topics briefly touched upon include: Copper Mining and Smelting, Bal Maidens, Cornish Gunpowder and Safety Fuze Manufacture, the Man Engine and Mining Schools. The new section dealing with Bal Maidens is particularly telling, as it corrects some of the Dickensianesque misconceptions about their plight as victims of an oppressive system, whereas for many they chose their employment.

Throughout this booklet advances in technology are highlighted which

improved productivity or helped keep the ever-deepening mines competitive. For example, there is a section concerned with mineral tramways such as the Gwennap-Portreath track which replaced circa 1000 mules a day, each carrying 2-3 cwt of copper ore. The significance of the safety fuze, the introduction of black powder and other subsequent explosives, improvements in steam engines, and the impact of rock drills are also woven into the text all helping to explain the evolution of mining in Cornwall.

This edition has been extensively rewritten and updated to reflect modern thinking. Together with a smattering of historic photographs and etchings, the text is both authoritative and easy to comprehend. For the layman and student it provides an excellent overview and introduction to the industry which shaped almost every aspect of Cornish life for many centuries. It should certainly whet the appetite for students to delve deeper into Cornwall's subterranean past.

CNF

COVID-19

The coronavirus has affected the Trevithick Society in many ways. The programme of events, including the AGM weekend, the evening lectures and field meetings, was cancelled. The Council has not met since the lockdown began although it has kept in contact primarily using email.

The wholesale cancellation of local events, such as Trevithick Day, has also meant the yellow tent and the 'canary crew' have not been seen this year. Not meeting the general public in this way has meant lost opportunities to publicise the work of the Society and Industrial Archaeology in general. In turn there has been a drop in revenue through lack of sales on the stall, plus recruitment of new members has dropped - many of whom join as a result of visiting the yellow tent.



Some aspects of the Society's work has continued unabated. Kingsley Rickard's chatline operates as normal, Sheila Saunders continues to deal with membership queries, the bills get paid by Jerry Rogers, the website has been rejuvenated by Pete Joseph and the Journal has been edited by Graham Thorne. The newsletter has benefitted from the lockdown in that additional material from more members has been sent in for inclusion. It is certainly good to draw on a wider stream of expertise in this way.

So, like the proverbial swan, all looks serene on the surface but unseen beneath, the legs are busy paddling, albeit less frantically than in previous years.

As you will see overleaf, the Puffing Devil had its boiler test suspended and that is now in the process of resuming, this time filmed as part of a Channel 4 documentary series. Before filming began the crew had to sign a host of forms declaring we were free of Covid-19 and had to answer similar questions on the day of filming. We then had our temperature checked using a scanner before filming commenced. This was repeated later in the day when Sean Oliver and I were hot and sweaty from our labours. Interestingly the second reading recorded a lower temperature than the first despite feeling hotter from our exertions. It seems that the body has an efficient cooling system but the brain is not as accurate at assessing body temperature.

CNF

PUFFING DEVIL

Several years ago it was decided that the boiler drain plug should be replaced by a blow-down valve as the threads on the drain plug were reaching the end of their life. Replacing the drain plug has meant taking the engine to Henwood Engineering of Summercourt who specialise in restoring traction engines (www.henwoodengineering.com). This was duly organised by John Sawle who also arranged for the second ten year boiler test to be undertaken at the same time. This was suspended in March due to the coronavirus lockdown.

In the meantime Sam Henwood had been contacted by Channel 4 *Devon and Cornwall* documentary production team wanting to feature his engineering works in the forthcoming series. They asked if he had anything interesting coming in - "the Puffing Devil" was the reply.

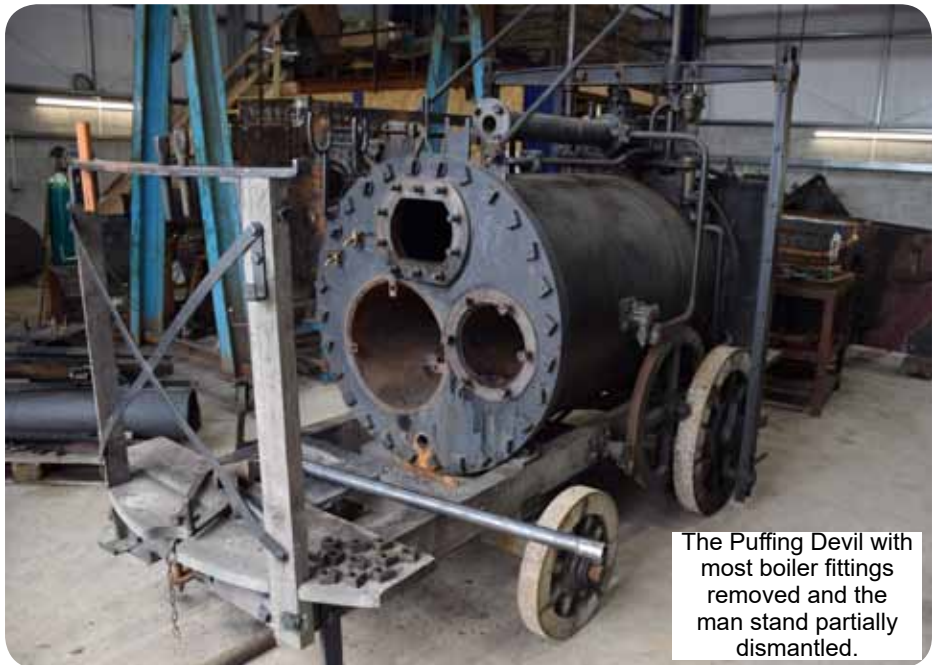
So the whole process is being filmed, starting with the delivery of the

Puffing Devil to Henwood Engineering by John Sawle. This was followed by a day of filming as Sean Oliver, Sam Henwood and I stripped the front of the engine. The removal of every nut and bolt and all the fittings were meticulously filmed from many angles, with some parts refitted and removed again in a second take.

The photographs show some of the stages in the disassembly of the engine. This is the first time the firebox has been removed from the engine since its construction in 2000, so we were all very keen to see how it had fared in this time.

At the end of the day the firebox was put on a trailer and transported by John Sawle to Jays Gates at St Agnes (www.jaysgates.co.uk) who sand blasted the outer surface of the firebox. When cleaned up the amount of corrosion was found to be minimal.

Sean also spent a second day at Henwood Engineering using a needle gun to clean the rust off the inside of the boiler itself. He also removed fittings at the back of the engine to enable three additional plugs to be fitted which will be used to



The Puffing Devil with most boiler fittings removed and the man stand partially dismantled.



pressure hose the rear of the boiler.

The engine is now cleaned and ready for the boiler inspector to thoroughly examine the internal parts of the boiler, using ultrasonic tests, etc. Sam Henwood

will then fit the blow-down valve and new plug and the engine will be ready for reassembly. Once it has been rebuilt the second part of the boiler test will take place - a hydraulic test and then a steam

Sam Henwood heats up a troublesome bolt.



Sam Henwood uses a rivet removing air tool to free a swollen bolt.



test. Each of these stages will be filmed by the television company who then want to finish off with a day filming the engine driving on the road. We will probably go to Wheal Busy for this, especially as the

cameraman mentioned the possibility of using a drone sweeping over the engine houses and then over the Puffing Devil. That will be the first time a drone has been used on a Puffing Devil shoot. Much



A forklift carefully lifts out the firebox.



The firebox sees the light of day for the first time in twenty years. Note the complex shape as the firebox cylinder narrows to join the lobster back bend and then narrows again to exit with the chimney dimension. The original would have been made from riveted small wrought iron plates.

depends on the Covid-19 second wave as to whether all these plans come to fruition.

A distinct tide line can be seen within the boiler in the photograph below representing the mean water level when operating. The square plate below it on the right covers the point where water is pumped in.

CNF



Sean Oliver and John Sawle inspect the boiler interior.

SMELTING LEAD/SILVER

Going back a number of generations my family were heavily involved in the cork industry in both Spain and Portugal, and in the shipping thereof. My great grandfather, William M S Bucknall (1829-1866) was sent by his father Henry Bucknall (owner of the business Henry Bucknall & Sons) on a voyage on a sailing cargo ship from London to Spain & Portugal to bring back cork to England in 1845. William kept a journal of the whole voyage which is now in my possession.

They sailed from London to Newcastle to load coke which they used to sell to the lead smelters in Carthagena, and which both acted as ballast and paid for the outward voyage.

Once in Carthagena they unloaded the coke and re-loaded the hold bottom with both lead ingots and 'spelter' to act as ballast for their return voyage because cargoes of cork were very light.

The following extract from my great grandfather's journal may be of interest to those familiar with the methods of metals extraction from ores at that time:

[The English is a little confusing but remember he was a young man of 16 at the time!]

"Friday 15th August. Captain and self went in pursuit of lead ore in the mountain. Found several caves where it had been dug out but it does not pay. They get the ore from Cape de Gatt distant 70 miles.

The ore they melt into lead makes on average 1/5th lead and about 2 pigs of lead or 1½ cwt. We shall have about 80 ton of lead on board.....and that as also most all they make does not more pay than their expenses – it is the silver they get from the ore that pays and to get the silver they make the lead to help pay the expenses of melting the ore, for to extract the silver by itself would not pay them at all.

Consequently the more lead they make the more silver they get. I saw

5 large bars they had just taken from the furnace. It goes into 3 furnaces, the first they procure the lead and silver from the ore. The next furnace is a kind of oven with the fire on one side and the oven on the other, with the bottom a fine sieve of iron. The lead is thrown on the sieve and bones pounded up and minced with water like mortar and put in with it. That is the only thing that will extract the silver from the lead, and when the lead begins to melt it runs through this sieve and the silver remains on top.

This lead that comes off is much mixed with the ore (or maybe the bone mix?) and is called spelter. We have some on board instead of lead for ballast.

The last lot of silver they sent to Cadiz to make into money was 3,000 ounces for which they get 5/4 per ounce. To tell whether the silver is pure it must be brittle: if it bends it is not so pure.

- Monday 18th August: loading lead 625 pigs.
- Tuesday 19th August. Loaded 204 more bars of lead. Total 829 bars.
- Wednesday 20th August. Loaded 799 baskets spelter
- Thursday 21st August: Set sail for Villa Nova in Portugal to load cork for father."

Well, it was certainly a different way of extracting the silver! The text is a bit confusing because I thought 'spelter' was an alloy of zinc!

Tim Bucknall

CAN YOU HELP?

Does anyone have any information on Richard Trevithick's early fixed/portable engines in London beyond what is in Francis Trevithick's book and the published correspondence? One letter talks about 12 engines being at work circa 1804 but only one or two seem to have any locational provenance. David Watson (who had previously been an engine erector for

B. & W. in Cornwall) seems to have been the main intermediary/maker.

I'm interested as I am trying to reconcile the list of engines in 1805 in Farey's Treatise with the Boulton and Watt records, other information from my early engines database, and the little that is known about what happened immediately after Watt's patents expired.

Any advice would be welcomed!

Email: john.kanefsky@btinternet.com

CHARLESTOWN FOUNDRY

I found these old slides of a visit of the Cornwall Waterwheels Preservation Society to Charlestown Foundry in May 1970. The wheel was put into operation - you can see the water cascading down the wheel.

The man in the blue jumper by the waterwheel is probably Alan Stoyel. The men with bags, etc on the left of the photos were, I believe, from Westward Television.

Had we been in less enlightened times I would have pointed out the unusual sight (for 1970) of a young lady in a miniskirt at one of our outings but in this era of sexism and MeToo I will refrain from any comment.

Jim Lewis



BOOK REVIEW

North Road to Minions: The GWR's Plymouth Division Civil Engineers and the Caradon Branch Line 1908 – 1948.

Do not be put off by the catchy title! This is a very interesting read and although of limited general interest it will appeal to those who know the Plymouth area and are familiar with the Caradon branch and the southern section better known today as the Liskeard – Looe branch line.

This is the culmination of ten years of research by member Alec Kendall and the principal characters involved are the three G.W.R. civil engineers, H.D. Smith, H.S.B. Whitley and E. Lake, OBE. Sadly these men are virtually unknown but occupied the post of G.W.R. Plymouth Divisional Engineer in succession from 1908 until nationalisation. For those of us who travel on the main line today through East Cornwall or roam the mining area of Caradon cannot help but see and feel the legacy of these three experienced engineers. The amount of detail about these three men, their personal lives, their families and professional lives is remarkable. The book is written in an easy style, well illustrated with photographs and drawings, two appendices and has an excellent list of references.

The book is an A4 paperback of eighty one pages and priced at £15-00 which includes p&p. Due to the small number of books being available prospective purchasers should initially e-mail the author at kendall940@btinternet to reserve a copy. Payment will then be by cheque payable to Caradon Heritage Partnership.

K.J.T.R.

PENYDARREN UPDATE

Many thanks for the latest Trevithick Society newsletter, and all of the work that you do to keep the members informed and enlightened.

When reading the article by Tim Smith 'What Happened to the Penyardarren Locomotive', I was struck by the statement: '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.'

As far as I am aware there is only one working replica, which is now in the National Waterfront Museum in Swansea, but it was first run in the Cardiff Waterfront Museum in 1981. I was at that event, as was my brother-in-law who worked for Renold Chains, one of the contributors to the project, based in Cardiff. At present I cannot find my photographs, but below is a copy of my invitation.

Later that year, in July, the replica had, what I think must have been its first outing, when it was taken by British Rail to Merthyr Tydfil to feature in the naming ceremony of a new diesel locomotive to be used in South Wales. The Richard Trevithick nameplate was unveiled by a distant cousin of mine, Mrs Cherry Michell from Sussex, Trevithick's great x3 granddaughter. A copy of this invitation and two photographs are on the next page.

Sadly, the Welsh Industrial and Maritime Museum in Cardiff was closed in the late 1990s making way for the Cardiff Bay regeneration, and many of the exhibits were placed in the National Museum of Wales collections store, which is not open to the general public, but the replica is displayed well in Swansea.

Kenneth F. Trevithick



NEW STEAM MAIN PART 2

The new high pressure steam main at Levant has been constructed from 2" diameter Schedule 40 steel pipe (i.e. 40 bar/600 psi). The design is as simple as possible with threaded flanges and joints, fully drained and insulated. The pipe layout is 'L' shaped running from the top of the boiler, straight across the room, through the wall, then turns 90° into the pressure reduction valve.

At 150 psi the temperature of the steam will be around 186° centigrade. At this temperature, the 2" Schedule 40 pipe will expand at 2.25mm/m. To compensate for this expansion, the long run of pipework is under 6-7mm of tension when cold. The new pipework has reduced the internal capacity of the steam main by around 85%.

John Woodward



BOSCASWELL DOWNS MINE

In the last newsletter, Sally Foster sent in a photograph that included her grandfather, Cornish Millett. He was involved in the reworking of Worvas Downs Mine and, at much the same time, with South Providence.

There is a connection with these mines and the article by Len Phillips on North Boscaswell.

In May 1909, Mr Douglas Steuart bought, for Boscaswell Downs Mine, the whole of the plant and equipment of Worvas Downs and South Providence for £2500.

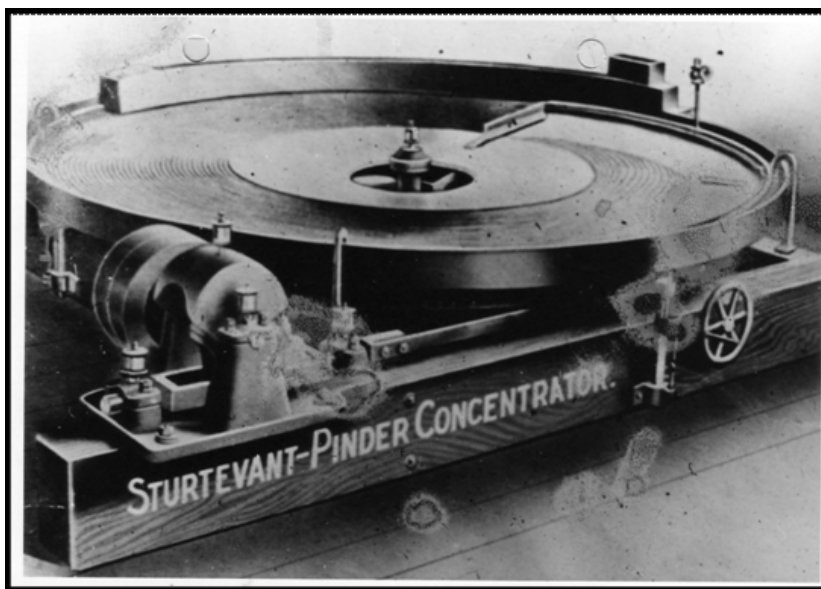
Sometime previously an inventory of the equipment at Worvas Downs included:

- Surface equipment; a pair of 12 in. winding engines, 4ft 6in drums and boiler. Mill engine, cross compound condensing 120 h.p., air compressor for 4 drills. Two high pressure Cochrane boilers.
- Mill; ten heads Californian (Holman) 1050lb, Robey 8ft by 12ft stone breaker. One Record vanner table

and necessary buddles, burning house, 0.5 ton capacity, dressing house, slime plant etc.

It is interesting to compare this with some of the machinery that was on the mine in January 1919 .

- Trease Shaft - 35ft pitch pine headgear with bins, sorting floor, double skipway with skips, ropes etc.
- Powerful hauling engine and boiler capable of hauling from 1000ft.
- Tramline and pitch pine gantry to mill and 6 trucks.
- Mill 10 Head Californian Stamp mill (1040lbs), Rockbreaker.
- 3 Sturtevant Concentrators.
- 1 Record vanner.
- Powerful Mill Engine (Compound condensing) with 2 Cochran boilers capable of running 20 stamps.
- Tin dressing house with Merton Roasting furnace.
- Sturtevant concentrator and tin dressing buddle.
- Treweeks Shaft - Hauling engine and Boiler, Headgear (24ft) ropes, kibbles, tramline to Mill (400 yds).

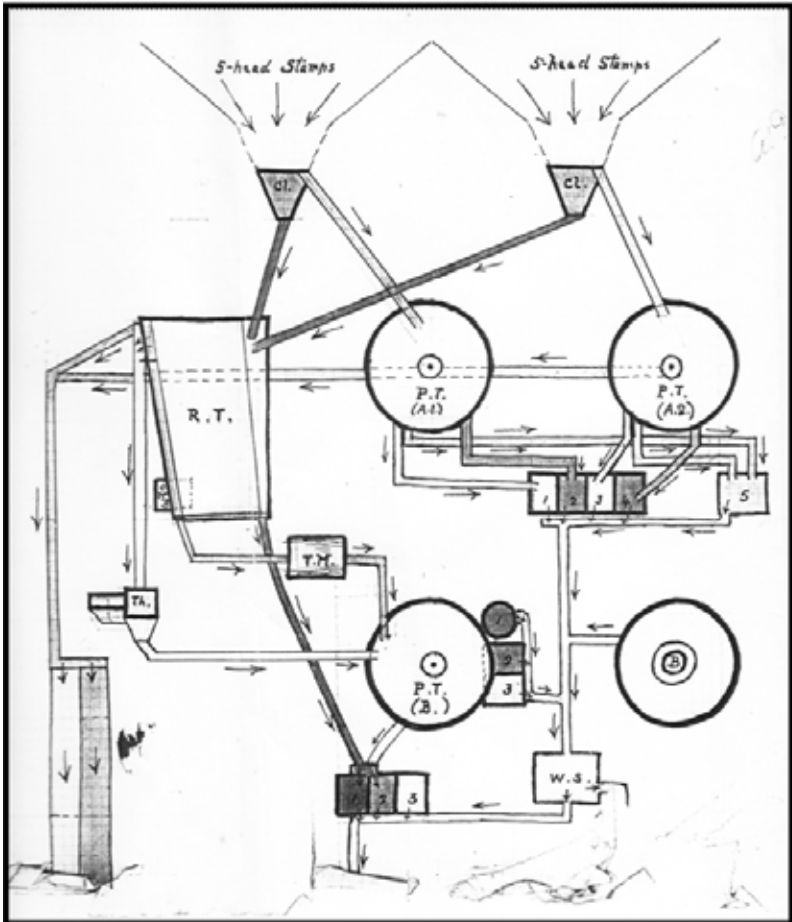


The Sturtevant Pinder table which is, I suspect, unfamiliar to most readers, was designed in the United States about 1900.

Whilst at first glance it looks like a Cornish round frame it is, in fact, a form of shaking table. It was a circular table that sloped towards the centre. The surface was covered in linoleum, with a system of 56 tapering brass riffles arranged spiralling and radiating from the direction of the centre outwards. The feather ends terminated in a regular sequence near to the outer edge or circumference. The feed box is the circular launder attached to the far side of the table. Wash water came from a fixed curved pipe suspended over

the edge of the table. The whole thing was driven by an eccentric that moved the table round and then jerked it back

So how did it work? Very much like a standard shaking table. The pulp from the feed launder flowed down the table towards the centre. The heavy (high specific gravity) particles tended to get trapped behind the riffles and the lighter waste continued down toward the centre. The jerking action of the table drove the heavy particles, that were trapped behind the riffles, up the table towards the wash launder. The highest grade concentrate would report at the top of the table with a middling further down.



It seems to have been an unnecessarily complex piece of equipment and I have only found two instances where it was used in Cornwall namely: one at Giew and the four at Boscaswell Downs. I have been unable to find the foundations of the one at Giew (NGR 497371). It may survive, but the site is hopelessly overgrown.

At Boscaswell, the plant (NGR 381351) erected in 1909, consisted of 10 heads of Californian stamps. The pulp was classified and the coarse material fed onto a single Record (shaking) table, the finer fraction feeding two Pinder tables. The middlings from the Record table were ground in a ball mill before being fed to the third Pinder table. The concentrate was put through a Merton calciner, itself a rare installation in Cornwall, before final re-treatment on the fourth Pinder table.

Despite apparently closing around 1914, the mine was last worked in 1919.

As regards the calciner, I suggest that it is unlikely that the dust chamber, which adjoins the Merton calciner, was intended to catch arsenic. There has to be a significant temperature drop for the arsenious oxide to sublime, which is why most arsenic labyrinths are some way from the calciner. However the Merton calciner, with its rotating shelves and cascading action, would create more dust than the slowly rabbled Brunton calciner, and thus there would be the need to slow the exhaust velocity to enable this dust to settle. The mine, then and previously, does not appear to have produced arsenic.

- i MJ 22/5/09 p649.
- ii LWCM Vol III (Oct?) 1909 p110.
- iii LWCM Vol II part 18 mar 1908 p293.
- iv Original at Geevor (1994).
- v Mining Journal 23 January 1904 p92.
- vi MJ 27/9/19 p626.

Tony Brooks

PUBLICATIONS

The Redruth and Chasewater [sic] Railway entirely owed its existence to the mines of its hinterland. It attracted little attention outside its immediate locality. Its history was recorded by D. B. Barton in a small book, published in 1960 and reprinted in a revised edition in 1978. Copies of this are now quite scarce. Eric Rabjohns of Carharrack has been researching the line for some years and has amassed a large collection of photographs. He recently approached the Society with a proposed book, using his photographs to portray a journey on the line. His photographs will be supported by maps and captions. Barton's history was thorough and the years since have produced little to add to his story but his book had very few photographs. Our new publication will fill that gap and take the reader on an illustrated journey along the railway and its branches. The book will be in a format to do justice to Eric's pictures and should be available in October.

Graham Thorne

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.

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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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