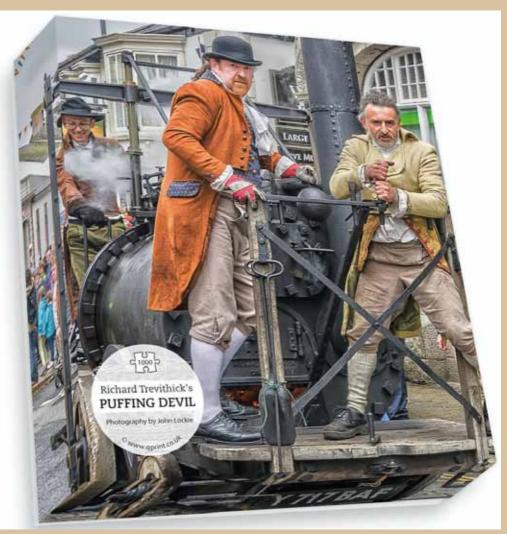


NEWSLETTER 193 AUTUMN 2021



The Puffing Devil is in a thousand pieces! Actually it is now available as a jigsaw thanks to an enterprising shopkeeper in Camborne.

Reg. Charity No. 1,159,639

EDITORIAL

Recently I was told about the appearance of a strange looking plant at Carbis Bay. It turned out to be Flixweed which was last seen in West Cornwall in 1925. It seems entirely possible that the G7 conference at the Carbis Bay Hotel and the massive phalanx of security personnel from all over the world has left a lasting legacy for Cornwall after all!

Flixweed is common in parts of North America and whilst searching for comparative images of this plant on American websites I came across a particularly good set of photographs on the Missouri State University Midwest Weeds and Wildflowers website. The photographs were taken by Dr Pamela Trewatha. Intrigued by Borden surname I made contact to find out if she had Cornish connections, thinking that on arrival in America the original Trewartha surname got corrupted to Trewatha.

Her reply was a revelation and an interesting twist on the origin of surnames. "My husband's greatgrandfather and family came from Cornwall to the U.S. in the late 1850s to early 1860s. Interestingly, his name was John Andrewatha or Andrewartha (difficult to tell from the handwriting on a marriage document at the recorder's office in Plymouth, England), and he married Jane Tregilgus before he emigrated. The family story has been that when they came to the U.S., they used the "combined" surname of "Tre" from Tregilgus and "watha" from Andrewatha.

Before coming to the U.S., John and Jane and their ancestors lived in Lev

Mill. St. Austell. Gwinear and Redruth in Cornwall. John was a copper miner and left Cornwall when the mines weren't producing as well. He become a lead and zinc miner in the U.S.

In the U.S., many people ask if the Trewatha surname is Native American. due to its sounding similar to Hiawatha, an Indian girl in the Longfellow poem, Song of Hiawatha."

CNF

The Society Programme Secretary Dave Crewes has temporarily stood down due to illness. We wish Dave a speedy recovery. Such is the state of under funding of the NHS that he phoned Sheila Saunders from an ambulance that had been parked outside Treliske Hospital for four hours awaiting admission. Sheila has very kindly agreed to step in and keep the programme of events running.

The Zoom meetings broadened the geographical range of the Industrial Archaeology topics we have been able to cover and most importantly enabled members from far and wide to attend meetings. The two furthest afield being from New Zealand and Israel. More Zoom talks are planned and members will be notified by email, nearer the time, about each talk. If any member would like to give a Zoom talk or knows of someone who would, please contact Sheila Saunders.

We hope to resume face to face meetings in some form in 2022.

Thank you.

CNF

Copy date for next newsletter:

December 15th 2021



Established 1935

NEW MEMBER

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

Ben Sumpter Helston

LETTERS TO THE EDITOR

Dear Editor,

Thank you for advising me that I have been accepted by The Trevithick Society as an Honorary Member. I really appreciate being classified as such.

Over the years I have been unable to attend any Society events but have retained my strong interest in the Cornish mining industry.

Having been born in Pendeen, I used to enjoy my visits to Geevor where my uncle was a stoker for the winding engine before moving on to the compressor house. It was probably in those days as a teenager that my interest in steam power was formed. I can still remember being in the winding engine room and seeing the engine operating. It is still in place and the curator a few years ago told me that I am the only one to have mentioned seeing the engine run.

My mother was a Mousehole girl and therefore I have many happy memories shared between the north and south coasts of West Penwith. Different weather conditions on the same day were not unusual!

M J Bowden Portishead

RED RIVER POETRY

Red River: Listening to a Polluted River is an 18 month research project funded by the Arts and Humanities Research Council, and led by Dr John

Wedgwood Clarke of the University of Exeter. It will explore how creative writing can transform our relationship to a polluted, post-industrial river through listening to the human and non-human voices that have shaped, and continue to shape, its course.

Working with schools, community action groups, artists, scientists, curators, geographers, etc. it is planned to study the complex impact of human activity on the ecology of this small post-industrial river through a series of creative workshops and events, and by making new work in a variety of art-forms that respond to what it tells us. These will include creative-writing resources for schools and adults interested in writing about rivers and ecology: an anthology and soundinstallation of poems made by school children and adults; a new a long poem for the Red River accompanied by a film; and a pop-up touring exhibition and series of performances.

The Red River rises on the moors above Camborne and flows through the Tuckingmill valley finally emerging into the clear waters of St Ives Bay at Gwithian. Although only 7.5 miles in length, it passes through a remarkably diverse physical and cultural landscape. Given its centrality to the Industrial Revolution in Cornwall, and the development of hardrock mining around the world the Red River's sediments are rich in stories and ecology that reveal the human and nonhuman legacies of heavy industry. It even contains a genetically distinctive form of trout that has evolved to live in its polluted water, a life form that may be considered as much an artefact of tin-mining as the Cornish engine-houses on the slopes around its banks: mining is in its genes.

The combination of ancient landscape use, post-industrial economic deprivation, environmental remediation, and the continuing growth in tourism based on the image of Cornwall as a romantic, rugged place, makes the Red River an exciting site through which to question what is wild and what is natural, beautiful and ugly, rubbish and valuable.

HOLMAN'S FACTORY CLOCK

The sound of the hooter and the rush of hundreds of staff, many with bicycles, into the street will be ingrained in the memories of the people of Camborne of a certain vintage. Unfortunately the Holman company was bought by a venture capital outfit, stripped bare and closed down in 2004 having been in business for just over two hundred years, a remarkable achievement. The final site of the three local factories of the Holman empire to close was Number One works the site which is now occupied by Messrs Tesco. For a short while before closure part of the site was used by Messrs Quaife, a company well known in the motor racing world. A feature of the area adjacent to Centenary Chapel was the factory clock which faced towards the town centre. The company offices and workshops were demolished shortly after closure and by sheer chance a local man, Ken Powell, well known in the motor trade locally, spotted the remains of the clock in a skip. He and his brother realised

it was an important piece of history and so "reclaimed" it and stored it for several years but eventually thinking something should be done with it contacted the writer. The clock was in a very sorry state but the writer felt that somethina could done with it. The frame was obviously home made by Holman's as it was constructed of timber reclaimed from old packing cases but unfortunately only the woodworm holding hands kept it together. The thirteen clock dial sections had also suffered damage

sustained in the demolition as these sections are of thin copper sheet which is white enamel coated with black enamel numbers and held in place within the dial by brass strips and with the time indicated by black hands. The refurbished clock is now at King Edward Mine.

I would like to thank Ken Powell for his patience as, at the time I received the clock I was in pain and awaiting a replacement hip and had considerable difficulty operating a workshop bench. The operation followed but created another very lengthy period of workshop activity being banned followed by a secondary problem of phlebitis which again forced abandonment of workshop activity for various periods. All this meant I certainly had time on my hands or was it workbench! All this medical attention created an inordinate length of time the project took to complete but we now have a reminder of such an important part of the story of Camborne and an item to view which many Camborne people will remember.

KJTR



PUFFING DEVIL

There is very little to report regarding the Puffing Devil. Due to the cancellation of the two main shows it appears at each year (Trevithick Day and the W.E.S.E.S rally) the engine has been moth balled for 2021.

Hopefully the world will be a better place in 2022 and, if so, the Puffing Devil will make its first appearance on Trevithick Day in Camborne (the last Saturday in April).

The Trevithick Day committee had planned a very special event for 2021 to mark the 250th anniversary of Richard Trevithick's birth. Therefore, given the planning that has already taken place, the resumption in 2022 may well give the town a sense of rejuvenation and renewed vigour.

CNF

GOONVEAN AND ROSTOWRACK ENGINE

A public meeting was held in August at the Lappa Valley Railway to discuss the long-term possibility of restoring this historic 50" Cornish engine and housing it on public display in a suitable engine house in Cornwall. The engine was built by Harveys of Hayle in the 1860s and the beam cast by Holman Bros. in 1928.

As yet there are no details to report about the meeting other than nearly half the audience were Society members.

The Goonvean Engine Trust has been formed to conserve and, eventually return to steam, the above Cornish Engine. The engine has been donated to the trust by Imerys and has been moved to a secure site. The current trustees are Kingsley Rickard, Jonathan White and Charles Daniel.

https://www.facebook.com/pg/getcornwall/posts/

CAPTAIN BEN NICHOLAS

Recently the writer was contacted by Robert Nicholas a descendant of the above named Captain to say that the family had a clock presented to Capt. Ben. The inscription upon it reading, "Presented to Capt. Nicholas by the employees of Parbola Mine Ltd, August 1907". It transpires that the younger members of the family have little interest in past mining history and it was therefore decided to donate the clock to the Society. As can be seen from the picture it is a quite an intricate item and very reminiscent of its time. It is a striking clock and a wind up but not in the modern sense!

We thank the Nicholas family for their thoughts in presenting the Society with this extraordinary item.



KJTR

DAVID MANN

Further to my piece in the last newsletter expressing concern over the future of the retail business of the Society I felt it would be appropriate to write a few words in appreciation of recently resigned Canary Crew member David Mann. Dave, who has sadly had to relinquish his membership and cease Society attendances due to the problems caused by vascular dementia, lives at Poole and came to Cornwall to help with the retail business at every opportunity but has not been able to visit for the last three years. His forte was being out with the tent, an interest no doubt he inherited as his late father's work was in organising marquees at major events such as the county shows. Dave was retail trained and then, being a systems man, moved into warehouse management and in his free time was interested in industrial history particularly railways, trams and buses. He did not actively promote himself but did much work behind the scenes for the Society. It was down to Dave that we had the original sweatshirts and t-shirts emblazoned with the Society logo due to a contact of his at Poole and through another of his contacts we had free paper bags, wrapping material, display stands and other stationery goods which we are still using. He used to come up with ideas for displays in the tent and on occasions physically made or obtained display items and brought them down to Cornwall. When we obtained the current display tent it was obvious that my own car trailer would not accommodate the growing quantity of equipment and so we invested in the current trailer with the Society logo adorning it and which will be familiar to many of you. Dave set about the problem of how to get all the kit into the trailer given that some items had to be protected from vibration and chafing damage when travelling and also being a single axle trailer the weight loading had to be balanced and the volume of kit we were needing to carry meant the use of space had to be carefully planned and the more

delicate items had to be placed above heavier items. He eventually worked out the best arrangement and I am aware that some members trying to help brought the systems man to the fore and felt the sharp end of Dave's tongue when their loading of the trailer but did not adhere to his stowage format. Many thanks for your past efforts Dave and I have happy memories of over fifty years of friendship.

KJTR

THE RETAIL ARM OF THE SOCIETY

The following is one of the saddest items I have ever contributed to this erudite publication. Readers will recall that in the last edition I asked members who may be interested in assisting with the shows and rallies to contact with offers of help. I am sorry no such help has been forthcoming, sadly a sign of the modern times, and, as from now, the Society will not be attending any further major events. We have had comments from far flung members who have said that, had they lived nearer, they would volunteer but unfortunately that does not solve the problem. I mentioned the health problems of the Canary Crew in the last issue and stated that we could no longer do the physical work involved. We have now reached the time of year when we have to plan for the next season as we have to start booking site pitches shortly after Christmas and now, during the autumn, we concentrate on the servicing and refurbishment of our kit and think about changes in our display arrangements. Those of you with retail experience will know that constant change is critical in keeping sales buoyant. Our best day of the year was always Camborne Trevithick Day when we could achieve takings of between £800 and £1,000. Sadly the current situation will seriously affect our retail turnover and also the publicity we get from being on view to the public will be lost. This is a very sorry scenario for the

second oldest industrial history society in the country.

Having preached doom and gloom I am pleased to report that I shall still be operating the retail business through the postal system or dealing with personal callers at Wheal Wrisket, 6 Seton Gardens, Camborne TR14 7JS, through e-mail on k.rickard@talktalk.net or the Chatline 01209 716811.

Should the help requested come forward then I hasten to add that both Phil Porter and myself will be happy to assist with sales, displays and advice as it is just that we can no longer do the lifting, or louster in local parlance, that is required, a perfect situation for "you lift and I'll grunt".

KJTR

ORNATE CASTING

The photograph below was taken in the main street of Camelford and shows one of a pair of ornate castings at ground level on the wall of a Methodist chapel. It appears to be covering a window. No makers mark was seen on the casting. I am not aware of any other casting quite like it in Cornwall and it certainly seems unusually ostentatious for a Methodist chapel.

CNF



HUMPHRY DAVY THE AGE OF INSPIRATION

Humphry Davy - The Age of Aspiration is a newly created piece of music celebrating the life and work of chemist and inventor Sir Humphry Davy. Davy was much more than this of course, he was a true 'Enlightenment Man' who was as passionately absorbed by the arts (poetry in particular) as by his scientific endeavours. With the later 19th and 20th century compartmentalisation of different areas of study, it became unusual for a person to have such breadth of intellectual pursuits as he did. Happily in the 21st century there is growing public enthusiasm for bringing together science and the arts, which has inspired Cornish composer Graham Fitkin and commissioning choir Three Spires Singers to bring this new work into being.

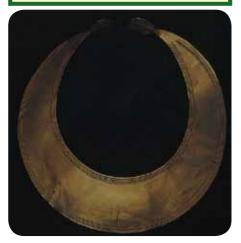
The first performances of "Humphry Davy - The Age of Aspiration" will be held on Saturday 20th and Sunday 21st November 2021, in Truro Cathedral. Three Spires Singers will be performing with counter tenor soloist Rory McCleery who will take the role of Humphry Davy, and the role of narrator will be played by actor Samuel West. We'll also be joined by Cornwall Girls' Choir and Cornwall Boys' Choir as well as over 50 musicians

of Three Spires Orchestra, with Christopher Gray conducting.

For more information please contact Lora Wicks, Chair of Three Spires Singers, at lorawicks@talktalk.net.

See also www.fitkin.co.uk and www.threespiressingers.org.uk

CORNISH GOLD



Dr Chris Standish gave a Zoom lecture to the Society entitled 'An Irish El Dorado?'. This summarised his research into tracing the origins of the earliest gold artefacts found in Britain and Ireland (lunulae and gold discs). Approximately 100 lunulae are known across north-western Europe and at least 80 of those were found in Ireland, hence the reference to Ireland in the title of the Zoom talk.

By obtaining a geochemical signature of the ratios of silver, copper, tin and lead isotopes within the gold and comparing it with samples of gold (stream borne nuggets and lode deposits) taken from ore fields across Britain and Ireland he was able to demonstrate the most likely source of the gold was Devon and Cornwall. Interestingly, the samples he analysed for Cornwall came from the Caerhays Collection and so would have no doubt come from the Carnon Valley.

As some of the gold artefacts predate the Bronze Age by up to 200 years, it now seems highly likely that the tin streams of Cornwall were first worked over for gold, in the late Stone Age, before the significance of the cassiterite was known. This pushes back the earliest known metal extraction in Cornwall by up to 200 years and suggests that by the time tin extraction began many of the techniques used for tin

streaming and metal working would have already been known. It is truly remarkable what gold nuggets collected by the Williams family of Caerhays, have been able to reveal well over a century after they were first collected and preserved for posterity.

The photograph to the left shows one of two gold lunulae found in 1864, together with a bronze flat axehead, while digging a pond at Harlyn Bay. Remarkably, the one shown is identical to a lunulae found at Kerivoa in Brittany which strongly suggests they were made by the same craftsman. The finds also highlight the strong links in prehistory across the seaboard of Western Europe driven by the trade in what would have been extremely precious and valuable metals.

CNF

Following the talk by Dr Chris Standish, Terry Lloyd made contact with a series of questions. Here are the responses:

Did the gold get fashioned into neck ornaments before or after it journeyed to Ireland?

Archaeologist Joan studied these objects in detail, and divided the lunulae into 3 types based on aspects including shape, size and decoration: classical. the unaccomplished. the and the provincial. One aspect of this classification is that the different types have complementary geographic spreads; the first two are, for the most part, found in Ireland, whilst the provincial are found outside Ireland. Although the geochemical analysis that I performed can't help solve the question of where the artefacts were made, I suspect that these distributions reflect different workshops/traditions, and it is more likely that the raw material was travelling from SW Britain to Ireland where local gold workers used it to produce their types of lunulae. There was also then a workshop/tradition either in Britain or perhaps Brittany that produced the provincial form. All something that needs further investigation.

What did the Cornish miners/panners get in exchange for their gold? Or did Irish goldsmiths sail to Cornwall and help themselves?

Another good question. We know that Irish copper was being exported to Britain from ~2400 BC the period of interest here. Ross Island (Co. Kerry) was the primary source of early copper for both Ireland and Britain, and copper from this mine has been identified by geochemical analysis throughout this area. So, with copper clearly being of importance for making tools, weapons and other objects during this time, this would be a good shout if trade/exchange is to be invoked. However, it may not be as simple as metal for metal, and other things may have been traded, including materials that are harder to identify in the archaeological record, e.g. livestock or humans, and like you say, maybe it wasn't traded at all, and people travelled to help themselves.

Does the fact that there were more goldsmiths in Ireland than in Cornwall at that time, imply that Ireland was more advanced?

Someone needed to feed and house the craftsmen. This might suggest a different kind of society, but I think it is difficult to prove, or rather its difficult to say that this wasn't also specialist crafts people in SW England. Other gold objects were being produced in the UK (it isn't really clear where), and this may also be the case for the provincial lunulae. Also, if gold extraction was centrally controlled in Cornwall, that would suggest a more centralised society too. However, my feeling is that this wasn't the case at the very beginning of gold exploitation in the region; the geochemical signature of the gold is very heterogeneous which doesn't favour a centralised approach, as if that was the case one might expect pooling of gold grains, e.g. casting into an ingot, before being transported away. With gold being available in many streams, it could easily be the case that anyone could go out and find some.

Does the fact that artefacts are still found, imply that Irish civilisation retreated some time after their production?

I should think that in the case of steady progression, if gold articles such as neck ornaments go out of fashion, then they are melted down and the metal reused for coinage say. By the same reasoning, might it be that neck ornaments were equally popular in Britain, but few survive because in this country the gold was reused. The difference in the archaeological record between Ireland and Britain could indeed be down to different practises of re-use. You may remember from my talk that the embossed tradition of gold working, which is centred in Britain and started around ~2000 BC, produced objects made from far larger quantities of gold. It could well be that many lunulae contributed to the metal pool for their production. However this apparent difference could also be down to an archaeological bias. Many of the Irish lunulae were found by people during peat cutting - a long standing traditional fuel source in Ireland. If these objects were deposited in a similar fashion in Britain, i.e. buried in isolated spots away from other archaeological features, then it is perhaps less likely that they will be found here. Indeed in the last 10 or 15 years a few new lunulae have been found in the UK, with the most recent being in Thwing, Yorkshire, and near Dorchester, Dorset. It may be that their apparent geographic focus in Ireland will start to shift as more are recovered, e.g. by metal detectorists. One final note is that it may be interesting that some of the recent British finds are fragments of lunulae. This could favour your idea of higher levels of recycling.

So here are a few quick thoughts on the questions you pose, and I think they are all interesting points worthy of further investigation.

Chris Standish

PLATE FROM DOWN UNDER

The Society has very gratefully received a plate from Mrs Warren in Australia who said:

"In 2010, my husband Dr Robert Warren and I visited Cornwall especially to see the Levant Mine. Robert was a member of the Trevithick Society for a number of years as he had a great interest in steam and beam engines. We stayed with a distant cousin of his, David Newton in Camborne, who he and his mother had visited back in 1999, and when Robert had seen a replica of the Trevithick Steam Engine.

David gave Robert a special plate commemorating Richard Trevithick, and issued in a limited number of 250. Robert died recently after a three year battle with a very rare cancer. He had ceased his membership of the Society about the time he was diagnosed. I found the plate in our sideboard and would like to return it to Cornwall for safe keeping with the Society."

Kingsley now has the plate to add to our collection of memorabilia. The Society did not have a plate like this before. As you can see it is number 24 of a limited addition.

It would be interesting to know whether any other item in the Society collection has travelled further.

Sheila Saunders







PUBLICATIONS

The 2021 Journal, Number 48, accompanies this Newsletter to members. Due to an unfortunate editorial oversight Michael Messenger's definitive article on the Portreath Tramroad went to press lacking a map showing its relationship to neighbouring mines and railways. The map will be printed in next year's Journal but we can supply digital copies of it, on request, before then to anyone who would not want to wait that long.

Graham Thorne

PUFFING DEVIL JIGSAW

Dominic Chatfield, the enterprising owner of Q-Print, a printing shop in Camborne has produced an evocative thousand piece jigsaw showing the Puffing Devil as it travelled though the streets of Camborne on Trevithick Day (see front cover).

The jigsaw costs £29.99 and can be obtained direct from:

Q-Print 45 Trelowarren Street Camborne TR14 8AQ Tel: 01209 719990

Alternatively you can order online from:

h t t p s : // w w w . e t s y . c o m / u k / listing/1059660004/1000-piece-jigsaw-puzzle-puffing-devil

Q-Print also does a range of mugs and cards with images of Trevithick Day, the Man Engine and the Puffing Devil.

INDUSTRIAL REVOLUTIONS

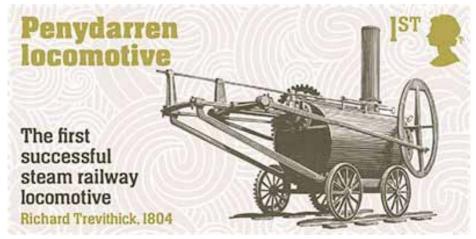
In August the Royal Mail issued a set of stamps which celebrate *Industrial Revolutions*, highlighting the pioneering spirit behind some of the most ingenious scientific and engineering advances made in Britain in the 18th and 19th centuries.

The set of stamps in counter sheets features six "ground-breaking inventions during what may be called the first Industrial Revolution, based on the exploitation of water and steam power, the use of new materials in construction, improvements in the efficiency of textile manufacturing, and the development of canal and railway transport networks."

1st class: PENYDARREN LOCOMOTIVE

The first demonstration of a steam engine transporting a load on iron rails was carried out by Richard Trevithick in 1804. The locomotive he built for the Penydarren Ironworks near Merthyr Tydfil pulled 10 tons of iron and about 70 men to the canal wharf at Abercynon, a distance of nine miles

CNF



WORLD HERITAGE STATUS FOR WELSH SLATE

The slate landscape of northwest Wales has joined the Cornish Mining Landscape to become a UNESCO World Heritage Site - the 32nd in Britain.

Welsh slate has been quarried since Roman times and has completely transformed the landscape of large parts of Gwynedd. At its peak during the 1890s the Welsh slate industry employed approximately 17,000 workers and produced almost 500,000 tonnes of slate a year – around a third of all roofing slate used in the world in the late 19th century.

There are many similarities with the Cornish WHS - a landscape transformed over thousands of years, a distinctive culture that grew up with the industry and a global impact - not only through the export of the products of the industry, but also the spread of technology

and mining/quarrying expertise throughout the world.

The World Heritage designation confers worldwide recognition by UNESCO and is fundamentally about preserving and protecting that legacy and history for generations to come, so it can play a positive role in the future.

Hopefully, it will lead to the funding of much needed preservation work at sites such as the Dorothea Enginehouse (photo below) with its Holman Bros. built Cornish Engine remaining within.

The approval follows a decision to strip Liverpool of its World Heritage status after fears developments, including the new Everton FC stadium, posed a threat to its value. The Cornish World Heritage needs to take note given the excessive amount of development taking place, much of it insensitive to the industrial heritage.

CNF



BEAM ENGINES IN NORTH AMERICA XVI: THE SMITHSONIAN'S HARLAN & HOLLINGSWORTH ENGINE AND OTHERS

Although the largest historically most significant collection of beam engines in North America is that on display at the Henry Ford Museum in Dearborn, Michigan (see Newsletters 92, 93 and 96), an important example of an American-built rotative engine (Catalogue No. 314791; Accession No. 209703) is held in storage in Maryland by the Smithsonian Institute's National Museum of American History in Washington, DC. The engine is not currently on view and I am indebted to Abeer Saha of the museum's Division of Work and Industry for many of the following particulars.

The 20-inch (40-horsepower). single-column, double-acting beam engine (#3806) was built by the firm of Harlan and Hollingsworth in Wilmington, Delaware, in 1851, and was non-condensing, its high-pressure (ca. 40 psi) steam being exhausted directly to the atmosphere. In 1852, it was erected at the machine shops of the South Carolina Railroad (predecessor of the Southern Railway System) in Charleston, South Carolina, where it drove planes, railcar-wheel presses, boring mills and an engine lathe by way of a belt taken off the rim of its 10-foot flywheel (Fig. 1). From this date it was worked continuously until 1927 (when electric motors were installed), surviving a fire that destroyed the machine shops sometime after the American Civil War. It then stood idle on-site (Fig. 2) until 1956. when it was donated to the Smithsonian Institute and transferred to what was

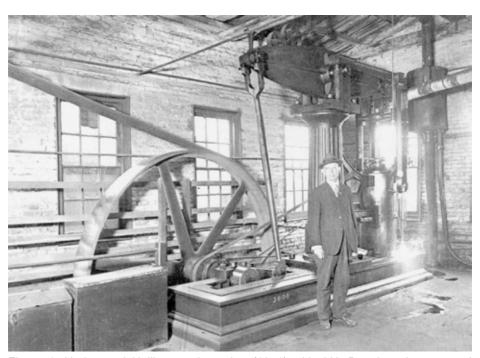


Figure 1: Harlan and Hollingsworth engine (1851) with J.H. Dunning, then general foreman of the company, at work in the Charleston shops of the South Carolina Railway in 1918 (Ties, The Southern Railway System Magazine, vol. 21, no. 3, p. 12, April 1967).

then the National Museum of History and Technology in Washington, DC.

What was to become Harlan and Hollingsworth began in Wilmington in 1836 as a railway car manufacturing partnership between Mahon Betts and Samuel Pusey, and became known as Betts, Pusey & Harlan when Samuel Harlan joined the firm the following year. In 1841, Pusey was bought out by Harlan's brotherin-law, Elijah Hollingsworth, following which the company (now Betts, Harlan & Hollingsworth) began an expansion into iron shipbuilding and the manufacture of marine engines. The firm finally became known as Harlan and Hollingsworth when Betts withdrew from the partnership in 1849. While continuing to build railway cars, the company went on to become the most productive iron shipbuilder in the United States, so much so that Wilmington became known as "the city that launched a thousand ships." Between 1856 and 1860, for example, the firm built four steamships for Charles Morgan's Southern Steamship Company, each powered by a single beam engine, and would go on to build him 28 ships. In 1904, however, the firm was acquired by Bethlehem Steel. Following this takeover it operated as the Harlan and Hollingsworth Corporation until 1917, after which it became the Harlan Plant of the newly formed Bethlehem Shipbuilding Corporation.

Once at the Smithsonian, the engine was cleaned and repainted in a colour scheme based on surviving traces of red and green body paint (Fig. 3). It was then re-erected and set to motion in the museum's new Hall of Power Machinery,

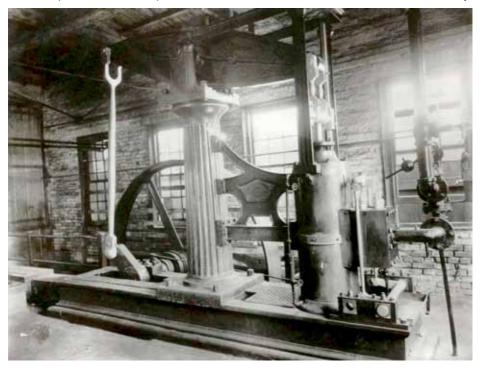
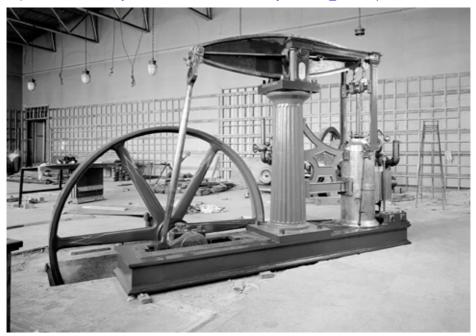


Figure 2: Harlan and Hollingsworth engine on-site in Charleston, South Carolina, in December 1928, following its retirement from active service in 1927 (National Museum of American History, Accession file 209703, courtesy Abeer Saha, Division of Work and Industry).

Figure 3. Harlan and Hollingsworth engine following its arrival and repainting at the National Museum of History and Technology in Washington DC in 1956 (National Museum of American History collections image NMAH-MAH-43705: https://americanhistory.si.edu/collections/search/object/nmah 846007).



which opened in March 1957. In 1966, the engine underwent significant restoration by museum staff assisted by Exhibits Aids Inc. The governor and water pump, both of which had been updated and altered from the originals, were restored, missing brass parts were replaced, large areas of the machined surface that had been painted over were stripped and polished, and the engine's red and green paint, which were not considered the original colours, was replaced with a new coat of cream and olive green paint thought to be more representative of the period (Fig. 4).

The museum's Hall of Power Machinery (Fig. 5) remains one of the oldest exhibitions still on display at the museum, but it is significantly smaller today than it was when it originally opened. This is because space was needed for newer exhibits and, unfortunately, one of the casualties of this downsizing was the Harlan and Hollingsworth engine.

On exhibit in the museum's current Hall of Power Machinery are two much older steam engines, one built by Thomas Holloway of Philadelphia in 1819 (Catalogue No. 319405; Accession No. 239089) and the other by Philadelphia locomotive-builder Matthias Baldwin in 1829 (Catalogue No. 323716; Accession No. 252392). Both are vertical, overhead crank engines with Watt-type centrifugal governors.

The 10-horsepower, condensing Holloway engine is believed to be the oldest American-built stationary steam engine in existence. But several pieces are missing and the engine is displayed as parts. The exhibit is therefore accompanied by a small model of the complete engine (Collection No. 323716; Accession No. 252392) built by the museum in 1964. The original engine worked in the Philadelphia brewery of Francis and William Perot until 1872. Having been established as

Figure 4: Harlan and Hollingsworth engine following its restoration at the National Museum of History and Technology in 1966 (National Museum of American History collections image NMAH-AHB2010q08719:

https://ids.si.edu/ids/deliveryService?id=NMAH-AHB2010q08719).



the Anthony Morris Brewhouse in 1687 by a prominent Philadelphia Quaker (and Francis Perot's forebear by marriage), and continuing as the Perot Malting Company until the 1960s, the brewery aptly became known as the "Oldest Business House in America." In the early 1800s, Thomas and William Perot automated the brewery to the astonishment of visitors by installing some of America's earliest stationary steam engines. Among these was the Holloway engine that the Perot Malting Company later donated to the museum through T. Morris Perot III.

The 5- to 6-horsepower Baldwin engine (Fig. 6) was used to provide power for Baldwin's small Philadelphia manufacturing business for textile printing machinery where compactness was key. Baldwin achieved this by using an upright cylinder on a bedplate about

five-foot square, a piston rod guided by grooves on the sides of the cylinder, and a yoke-type connecting rod. The engine was a great success and attracted much admiration, which led Baldwin to shift his business to steam engine manufacture prior to his establishing the Baldwin Locomotive Works in 1831. In the latter capacity, Baldwin would go on to build more than 1000 steam locomotives as one of America's largest locomotive manufacturers. The stationary engine was used at the locomotive works until 1873, successively supplying power to six different departments as the business grew.

The museum also holds in storage a diminutive 6-inch horizontal steam engine (2-foot stroke) built in Pittsburgh by F. and W.M. Faber in the 1850s (Fig. 7).

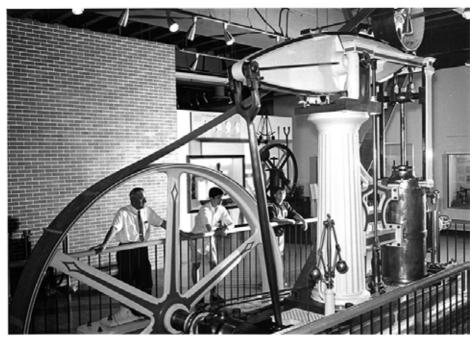




Figure 5 (above): Harlan and Hollingsworth engine exhibited in the Hall of Machinery at the National Museum of History and Technology (Record Unit 285, National Museum of History and Technology, Photographs 1920s-1970s, Smithsonian Institution Archives, SIA2010-3270).

Figure 6 (right): Matthias Baldwin's engine of 1829 on display in the Power Machinery exhibit of the National Museum of American History (photo courtesy of Abeer Saha, Division of Work and Industry).

Figure 7: National Museum of American History's 6-inch horizontal engine built by F. and W.M. Faber in the 1850s (National Museum of American History collections image NMAH-81-2977: https://www.si.edu/object/faber-steam-engine-1827:nmah_849029).



With a wooden bed, separate bases for the engine and the 79-inch flywheel, and refined decoration that extends to the Watt governor, the engine is considered indicative of the early days of American steam power. It was offered by Faber as an off-the-shelf stock item and spent the bulk of its working life in tanneries in Ohio and Kentucky.

Damian Nance



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.

LEVANT WATER CISTERN

Each winter since 2016/17 a considerable amount of restoration work has been done on the engine. My ongoing reports will be presented so that the reader can understand how the engine works, not necessarily in the order that the work was carried out.

The condenser sits in a large wooden cold water cistern which has a looped water supply from the cooling pond and keeps the condenser cool.

The cistern which sits below the floor was replaced in the year 2000. It now has two rotten planks, one on the west side and the other on the landward side. It was originally planned to replace the whole cistern but, following management receiving advice on the poor condition of the lower condenser casting, it was decided to only line the insides of the walls. Each was lined with a layer of 3mm thick sheet rubber gasket material, faced with laser cut stainless sheet metal which was retained by a large number of stainless screws and penny washers.

The above work was started before lockdown and finished afterwards, during which time the wood started to dry out causing more leaks. Consequently, this took considerably more effort to make the cistern watertight.

John Woodward



West wall of cistern.



Landward side of cistern.



Condenser inside the water cistern.

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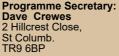
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The Trevithick Society, a registered charity, is a recognised body of the study of industrial archaeology in Cornwall. Membership is open to all who are interested in the region's great industrial past, whether or not they live in Cornwall. The Society 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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