The Trevithick Society

2026 AGM

Programme Notes

Compiled by

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Front cover illustration: Cligga Head, aerial view from the north-west. Cligga Head mine is on the right; this overlaps with the explosives works, which extends to the left. The airfield runway is in the background. ***Internet image.***

AGM 2026 Programme

St Austell area

Introduction

1. **Friday May 1st afternoon 2pm**
   Perranporth explosives works

2. **Friday May 1st 7.30pm**
   Luxulyan Valley: a talk by David Skelhorn

3. **Saturday May 2nd morning 10am**
   The Luxulyan Valley

4. **Saturday May 2nd afternoon 2pm**
   The St Austell Brewery

5. **Saturday May 2nd evening**
   The Victoria Inn
   5.00 for 5.30 AGM
   7.00 for 7.30 Annual Dinner

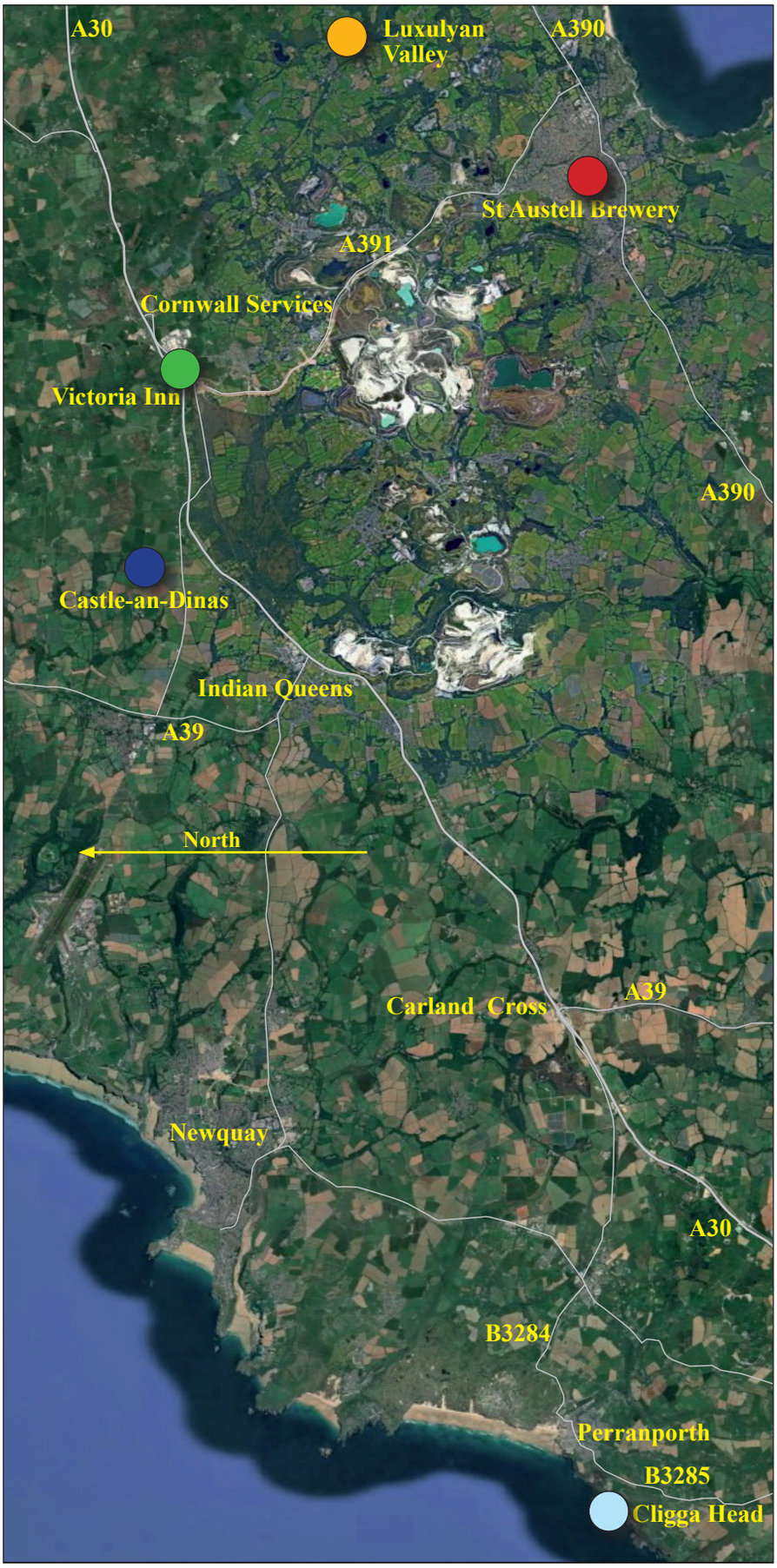
6. **Sunday May 3rd morning 10am**
   Castle-an-Dinas

Acknowledgements

All colour photos Pete Joseph unless otherwise stated. All line drawings Pete Joseph.

Thanks to Lisette Laird for transport services. Thanks also to Steve Barber for providing the images of the St Austell Brewery.

Programme locations, May 2026



Friday May 1st afternoon

Perranporth explosives works

The manufacture of dynamite

Making dynamite is a comparatively simple procedure, mixing nitroglycerine with an inert filler. The process used in explosives factories at this time worked on the gravity principle; fluids entered the processing system at the highest point of the site and worked their way downhill until converted to solids – the completed explosive. At Perranporth the highest point, where the nitric acid was made and mixed with sulphuric acid, was at the eastern part of the site.

Nitroglycerine is made by mixing glycerine with a mixture of concentrated sulphuric and nitric acids. Glycerine was usually acquired locally from candle and soap makers while sulphuric acid was imported. Following the connection of Perranporth to the railway network in 1903, it was collected from Perranporth Station. Nitric acid was made onsite by reacting sodium nitrate powder with concentrated sulphuric acid liquid.

The two acids were then mixed and stored in tanks at the acid factory; after cooling the mixed acids were taken to the next stage of processing in small tanks on the narrow tramline. The next stage in the process was the nitration of the glycerine in the two houses A1 and A2. Each house was necessarily kept warm, so to keep the operator literally on his toes he was given a one-legged stool to sit on. This needed careful balance even for one fully awake, and any untoward movement due to drowsiness would jerk the operator into full watchfulness, or put him on the floor.

From the nitrators the nitroglycerine was moved to the two separators B1 and B2. In the case of the eastern nitrator the nitroglycerine was sent through a brick-lined tunnel containing a lead-lined launder; the tunnel is now a curiosity for tourists. In these buildings the nitroglycerine was separated from the waste water and waste acids, which were recycled. The separators washed the nitroglycerine to remove any unused acids, the waste water being stored in the wash water tanks I and I1. The cleaned nitroglycerine was then taken to the C house for filtering – a final wash – following which it was stored in the expense magazine XU.

The dynamite was made by running nitroglycerine from a tap in the store tank in the C house into kieselguhr held in wooden “tubs”; giving this a preliminary mix by hand in the gelatine mixing houses Z1, Z2 and Z3. (There may have been other mixing houses but these are the only ones identified so far). The finished dynamite then went to the cartridging huts and from there the finished cartridges were sent to the packing house. Here they were weighed off into lots and packed into cardboard boxes. The boxed cartridges were sent to magazines for storage.

Company history

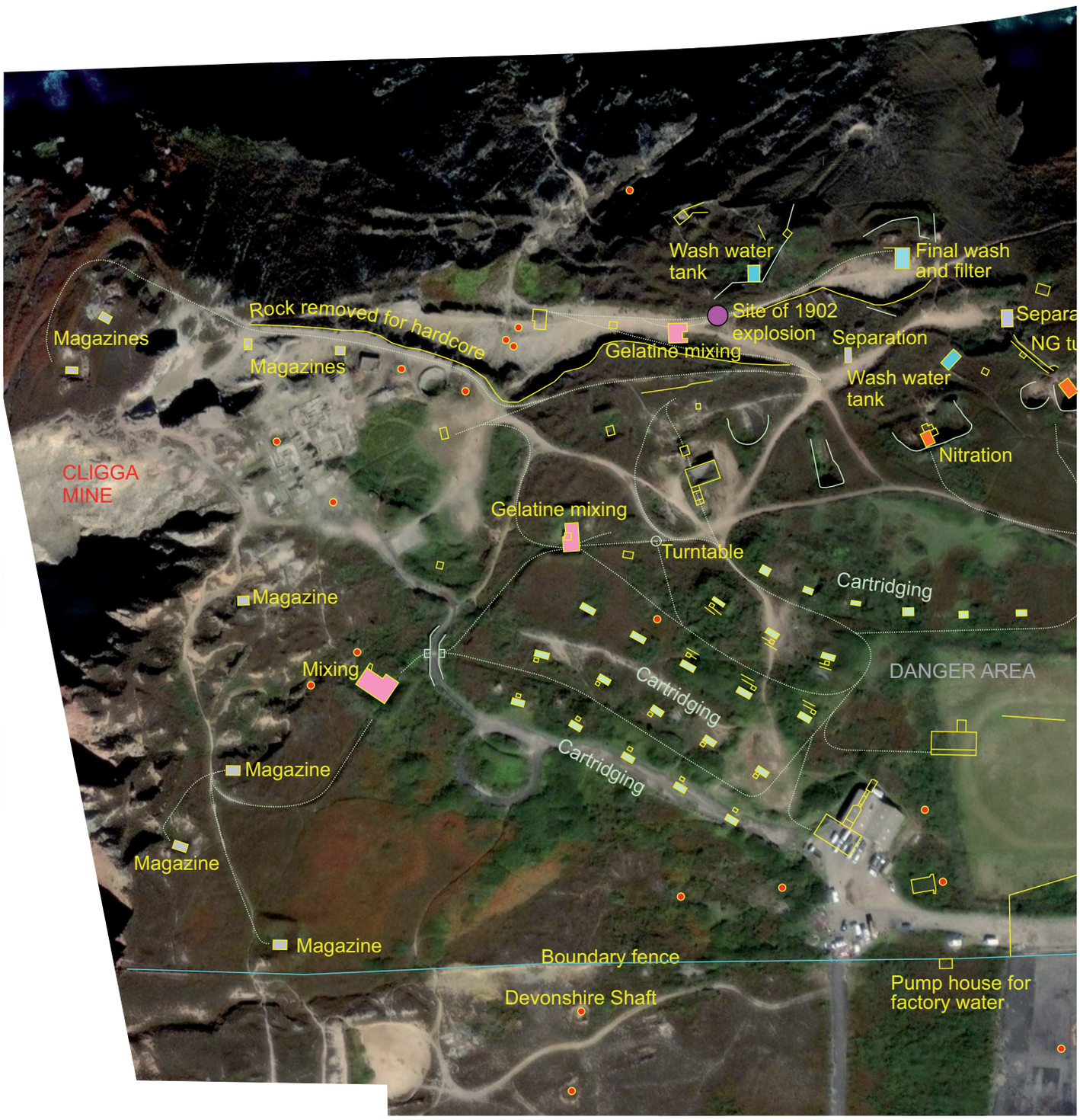
The British and Colonial Explosives Company had its beginnings in the operations of John Tonkin. In 1861 Tonkin was working at Davey & Co.’s powder mills at Nancekuke, eventually becoming a foreman. In 1863 he formed the Cornwall Blasting Powder Company, with an explosives factory in Bishop’s Wood, to the north of Truro. That factory ceased working in 1879, but in 1882 Tonkin was trading as the Cornish Dynamite Company.

In April 1889 Thomas Pryor, together with a Mr Boyle and a Mr Mackay, negotiated with Tonkin for the purchase of the company with the view to starting his own. After completion Pryor lost no time in floating the new company, called the British and Colonial Explosives Company. This was registered on 3rd December 1889 and Tonkin was appointed manager. The new company had a capital of £100,000 in £1 shares. A 100-acre freehold site was acquired from the Duchy at Perranporth; £8,750 was paid in cash for the site as well as all work and expenses needed to plan the factory. The site had already been surveyed, and plans of the proposed works prepared. The new factory would be capable of producing 60 tons a month.

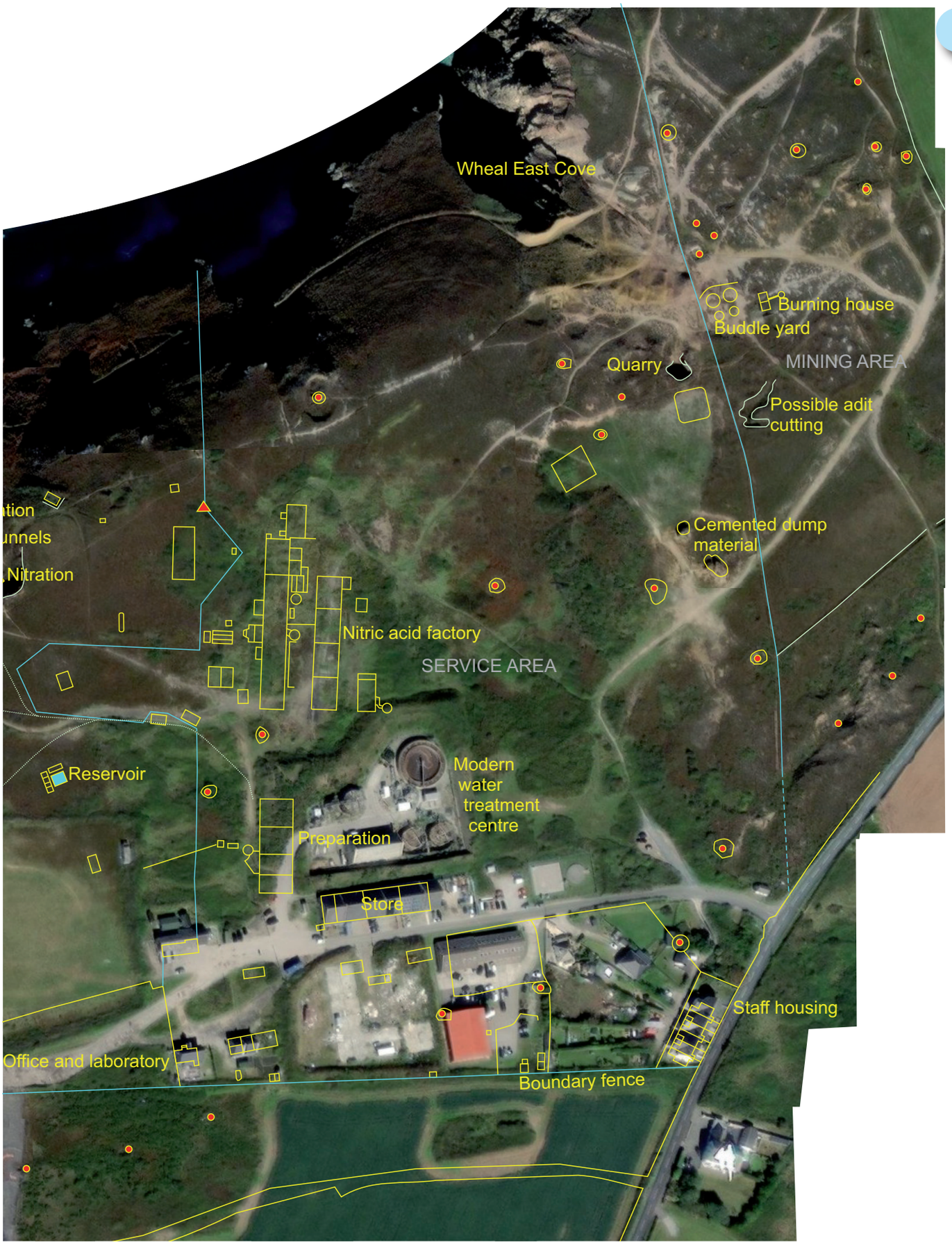
At the beginning of February 1890 the residents of St Agnes and Perranzabuloe had signed two “memorials,” presumably one for each parish, in favour of the new factory. Unfortunately the locals did not really appreciate what these memorials implied, certainly with regard to restricting

Friday May 1st morning

Satellite image of the explosives works at Cligga Head with buildings from the 2nd edition 25-inch Ordnance Survey plan transposed. Building interpreations from the 1902 HMIE report plus field survey work



Friday May 1st morning

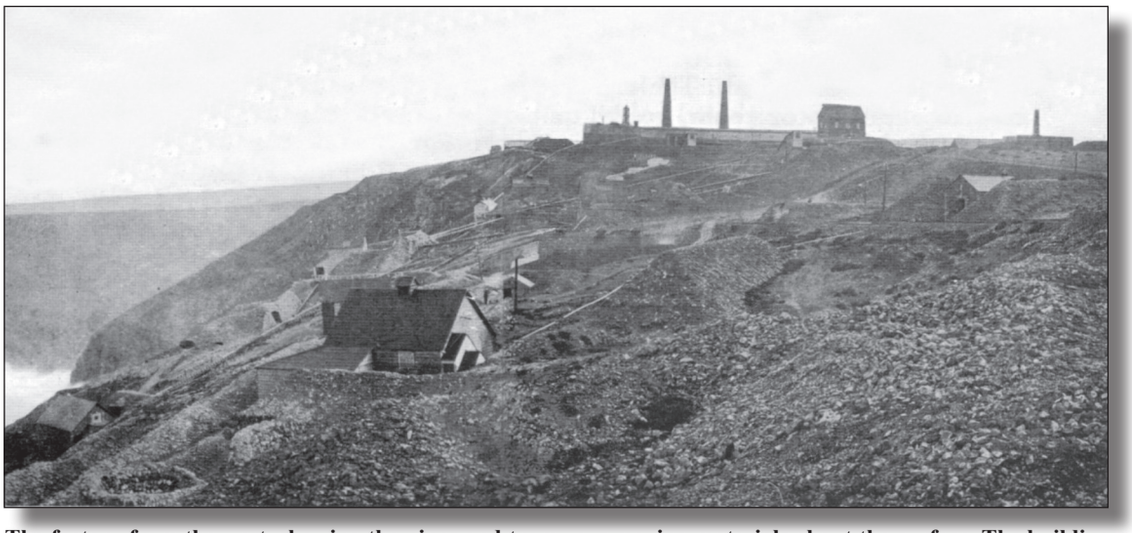


local access, this would come back to bite them over the coming years.

The site was “about 1,000 yards wide by Cligga Head, 1,700 yards on the opposite side, and 2,500 yards in length landwards.” The contract for erecting the thirty-six buildings was given to Arthur Carkeek. In September 1891 the authorising certificate from the Board of Trade allowing the company to proceed was given, and the factory was given the number 148.

In January 1892 the Cornwall Standing Joint Committee agreed that a special constable be stationed at the factory; the factory was finally reported complete, and production commenced on 14th February. The third annual meeting was held at the factory on 25th February 1892, with Colonel du Plat in the chair. Unfortunately the accounts showed an overdraft of £9,147, with a further £1,722 owed to sundry creditors.

The factory should have been completed early in 1891 but the opening had been delayed from unforeseen and unpreventable circumstances. With regard to the delay, the plans had been altered to meet changing productions; bad weather had brought more delays. The cost had exceeded the estimate, however the quantity of material used, and the machinery put in, “was extraordinary.” On site, 14 stone-built and 20 wooden houses had been constructed, covering an area of 40,000 square feet, and about 60,000 cubic yards of mounding had been worked up. An 80 yard-long tunnel had been cut through rock to provide a channel between two buildings to allow “dangerous fluids”, presumably nitroglycerine, to flow; this was done to save manual labour from carrying the fluids. A 2,000 yard long tramway had been laid, as well as 1,150 yards of lead-lined timber channels. Over four miles of pipes had been laid: 1,000 yards of lead, 2,600 yards of wooden: 2,000 for steam, 2,000 for compressed air and 200 for acid. The pipes used up 114 tons 7cwt of lead.



The factory from the west, showing the pipes and tramways moving materials about the surface. The building in the foreground may be Z1 gelatine mixing house, with A1, nitrating house, on the right. Note the very coarse material in the foreground and making up the bund around Z1, taken from the mine waste tips.

John Tonkin was replaced by Joseph Turner, and later claimed against the company for unfair dismissal. Turner, a Scot who later came to have a reputation for aggression, was a former employee of Nobel and had extensive experience abroad, particularly in Russia.

About thirty ‘girls’ worked on the site, mostly making cartridges. Making the cartridges was said to be physically taxing, owing to the body being in a constantly “jig-a-jig” motion when giving the composition its round, tubular shape. The constant contact with nitroglycerine gave the girls headaches, or “NG Head,” which could be very bad. To counter this, some girls kept small pieces of explosives to roll in their fingers to keep a certain level of nitroglycerine in their bodies. The practice was highly illegal, but made life tolerable for the workers. The various buildings

were “hidden behind mounds of earth and gravel, which in case of accident would confine, or at all events minimise, its effects.” This material was most likely the repurposed dumps of Perran St George Mine of which the 1st series 25-inch Ordnance Survey map (1878) suggests there were about 30 acres, almost all of which was gone by the time of the 2nd series (1906).

The fourth annual meeting of the company was held in London in April 1893. The company was in financial trouble and losing nearly £800 per month, a loss of £2,810 on ten month’s operations. Unfortunately the extra expenditure on building the factory, plus the delay in producing explosives had delayed any income. On top of this there had been a decline in Cornish mining; to add insult to injury, the South African mines chose to use locally made dynamite from Nobel’s South African factories. Finally, the end of Nobel’s patent had finally resulted in a number of new dynamite factories, and this open competition, plus reductions in prices by Nobel, had dropped the price to about £65 per ton.

To the 31st of December 1892 the company had spent £52,000, 52% of the company’s total called-up capital. It was not known what extra costs would arrive from the legal and overdraft charges and depreciation of the plant. It was suggested that the reason for the meeting being held in London was that no one outside of the London office was likely to know what these costs were. The annual meeting was confined to the directors and a few shareholders, members of the press being refused admission. The accounts, which were not detailed, showed a profit for the year of £2,285 4s 6d. After deductions for the debit balance of the previous year this left £668 6s 11d available for a dividend. Arrangements for leasing the factory to Nobel’s were now said to be complete.

Towards the end of April 1893 it was rumoured that the company had been taken over by Nobel and Co. A good arrangement was said to have been entered into “which will place the shareholders on a fair footing.”

On 15th September over a hundred members of staff of the British and Colonial were treated to a day out to Falmouth. The group left Perranporth in six Jersey cars and horse buses for Malpas, where they embarked on the SS *New Resolute*. After steaming down the Fal the harbour was

Nitroglycerine tunnel leading from A2 nitrating house to B2 separating house. The tunnel now terminates in a very steep slope as the material of the cliff slope, as well as the protective mound for B2, was removed for hard-core in the 1960s.

toured, following which a dinner was held at the Guildhall. The staff then split into groups to walk about the town; tea was had at 4pm. Joseph Turner gave a speech at the end of this which included the curious phrase that "He hoped they all might live to enjoy their next outing."

In July it was finally confirmed that all issues regarding the transfer of the factory's lease to Nobel's were resolved. Nobel's had decided to acquire absolutely "the whole undertaking and property of the company" for £36,000. Combined with the money left over after the last dividend, and after deducting the costs of winding-up, this would provide a dividend to the shareholders of about 16p per share.

On 5th September 1895 a letter from *Cornubia* was printed in the *West Briton* regarding the factory. According to *Cornubia* about 150 "workmen" were on the site, with many others in associated jobs. On one day he observed 68 carts and wagons and four "traction trains" [presumably he meant traction engines and trailers] entering the works (he could not). About 2,000 tons of sodium nitrate was carried from Falmouth and Hayle, and this employed another hundred men in discharging, lightering, loading and carting.

Although about to hand over the factory, in October the British and Colonial company accepted a contract with Messrs Veale and Co. of St Austell for the installation of electric light throughout the factory. This would be "to the latest and most improved style" and would include a total of 107 lamps.

Cut granite support for the tramway, on the north side of the building shown opposite. The tram rails were made from timber throughout, rather than just outside the danger area buildings.

Nobel's Explosives

Nobel's seems to have taken over the site at the beginning of 1896, but in March it was reported that a number of men had been discharged, and that a further reduction was on the cards. The brief reason given was the "loss of markets for productions;" if this was the home or foreign markets was not given. This came at a time when the company was being considered for taxation by the highway authorities.

In March 1898 the Truro Rural Highway Board met at the Municipal Buildings to discuss Nobel's traffic and its use of the roads. The Clerk acknowledged the receipt of a letter from Joseph Turner and sent a copy of it to the surveyor the following day. The Clerk had been instructed at the previous meeting to communicate directly with Nobel's and point out the amount of damage caused to the roads by the company's extraordinary traffic of heavy vehicles. It had been

ascertained from the surveyor that the extra cost entailed by Nobel's traffic was £600.

Resentment had been building up in the background that fencing had been put up around the eastern and southern boundaries of the site, preventing access to Hanover Cove and Cligga Head. In November St Agnes Parish Council had met regarding the road to Hanover Cove which was claimed to be obstructed. A letter from Joseph Turner was read to the committee; it stated that the road belonged to Nobel's and that anyone found trespassing would be arrested.

About a fortnight later a deputation from Truro District Council arrived at Nobel's with an appointment to inspect the alleged encroachment. To meet them "there was the redoubtable Mr Turner, with a bulldog, a policeman, and a few rank and file of the company's employees, who awaited the advancing intruders." The meeting however was an anticlimax, though the deputation did not give any information as to what happened. However it should be noted that the southern boundary of the factory site, as shown on the 1907 25-inch Ordnance Survey map, is to the north of Hanover Cove, suggesting that it might have been shifted north.

On the 16th of January 1902, about 11.15am, a wagon loaded with three wooden tubs of hand-mixed blasting gelatine left building C, the filter house. Each tub contained 177¾ lbs (80.6kg) of explosive, a total of 533¼ lbs (241.9 kg); the load was destined for one of the expense magazines where it would stay overnight awaiting machine mixing. When it arrived at the points opposite the wash water house I1 the wagon appears to have left the rails. The wagon was being pulled by Leslie Bown and pushed by James Menadue, the two being helped by James's brother, Frederick. What took place next was conjectured; however it resulted in an explosion so violent it was heard ten miles away in Truro. The explosion left a crater 20 feet (6m) long, 15 feet (4.6m) wide and 3 feet (0.9m) deep.

At the beginning of January 1905 the GWR extended its new branch line from Perranporth to Newquay. It was hoped that this would provide a fillip for the development of the mines in the St Agnes district. Perranporth Station had sidings for Nobel's traffic. Another accident took place on Friday the 4th of November which resulted in two deaths from the fumes of a petrol engine. The engine operated a water pump in Devonshire Shaft.

In December it was reported that operations at the site were to be suspended; the decision was then made to close the factory permanently. The fate of the equipment is unknown, it most likely

A very complicated feature! This is the south side of the protective mound which formerly ran around a possible mixing house. The masonry is one of the tramway tunnels which leads up to the cartridging huts. During World War 2 the feature was extended north and south with concrete blocks to form air-raid shelter.

went to Ardeer.

Following the start of the Great War there were constant rumours that the factory was to reopen, which it did in August 1915. It was not, however, for the manufacture of explosives, but for loading hand grenades, a comparatively new weapon. Work was to commence immediately, and women would be employed at very satisfactory wages.

In December 1915 Joseph Turner retired after 24 years managing the site. The factory was still moribund at this time and only being used for storage. His decision to move to Bournemouth may well have been affected by this, though it was his seizures which finally caused him to leave.

The number of workers at the factory is not known, but in March 1916 a large number of the men was discharged, with Nobel's insisting that they attest (join the armed forces). In 1926 C. H. Trenerry, the manager of the works, said that during the War no less than 1,700 men and girls were employed. From the 24th a special train for the munitions workers ran from Truro to Perranporth and back daily. The large number of men and women employed at the works could not find accommodation at Perranporth and the train would enable them to lodge at Mount Hawke, Truro, and other places near the line.

In August 1917 the death of Joseph Turner was announced. This had occurred just a few hours after one of his seizures. The funeral took place on Tuesday, 21st August, at Bournemouth Cemetery.

The end of the factory came in December 1920, when a public auction was held on the 30th. Unfortunately, wartime restrictions meant that nothing appeared in the press regarding the site, and at the date of writing no memoirs from workers have been found. The auction was held in shed 4; the items seem to have been the dregs of the site, the grenade filling machines and any remaining explosives equipment presumably having gone back to Ardeer.

During World War 2 small parts of the remaining sections of the factory became part of RAF Perranporth. This was a wartime base only, and decommissioned in 1945. By the end of 1946 the majority of its buildings had been dismantled. By this time the buildings of the factory had been largely removed, but it seems that all the protective embankments survived the construction of the runway and gun emplacements.

In September 1962 the Truro and West Powder Magistrates granted an application by Geevor Tin Mines Ltd. to store explosives at Cligga Head. This was to be stored in an existing building, one of the old magazines, and would hold a maximum of 1,000 lbs. of unspecified explosives.

The burning house in the small dressing floor to the east of the factory.

Geevor had started a programme of diamond drilling work at Cligga Head Mine the previous year and the explosives may have been for development work underground; the work ceased in 1964.

In 1995 a plaque recording the work of the women at the factory was put on the wall of the large circular water tank of the mine. This replaced a memorial stone, which was moved into Perranporth.

Nobel's Tin Mine

A provision was included in the terms of the lease of the factory land that mining should recommence. Perran St George mine had previously been mostly worked for copper, but tin was now a more valuable commodity and it was for this that the mine was to be worked. It was soon decided that mining should be confined to above the adit to avoid any pumping costs. An adit was driven from Wheal East Cove; which is not marked on any map. A small dressing floor was built just inland from this feature however, the remains of which aid in its location. The floor, as shown on the 1907 25-inch Ordnance Survey map, shows two pairs of buddles near a burning house. The stamps are not shown, however, nor is there any information on them, although a report from 1900 suggested that the stamping power was insufficient and that eight heads of Cornish stamps would probably be erected. It is possible that a small set of Californian stamps had been erected which may have been electrically powered.

The burning house was electrically powered from the factory's own generator, as the stamps might have been. Production from "Great St George and Droskin United (Western Portion)," was 15 tons of black tin, worth £834, in November 1889 and 4 tons of black tin, worth £95, in June 1893. However, while this mine is geographically in the correct area the figures are likely to be too early for the Nobel operation.

Saturday May 2nd morning

Luxulyan Valley

The Luxulyan Valley (from the Cornish *Glynn Gwernan*, meaning alder tree valley) is the steep sided and thickly wooded valley of the River Par, running SE from Luxulyan, around St Blazey to Par, a distance of about three miles. The valley became part of the Cornwall and West Devon Mining Landscape World Heritage Site in 2006, designated as area A8i, as it contains a major concentration of early 19th century industrial remains.

Most of the industrial remains in the valley are the results of the endeavours of local entrepreneur, Joseph Thomas Austen (1782-1850). He inherited the Treffry estate in 1813, changed his name to Treffry (his mother's maiden name) in 1808, following the death of his uncle. Treffry would become known as the "King of Mid Cornwall." Copper mining was booming in the area during the early 19th century, and Treffry was the owner of Fowey Consols Mine, on Penpillick Hill overlooking the Par River and the Luxulyan Valley. This was one of the deepest, richest and most important of the Cornish copper mines. The mine was situated to the east of the southern end of the Luxulyan Valley proper, and is also part of the designated World Heritage Site. At its peak it was worked by six steam engines and 17 water wheels, hence the requirement for leats to supply water.

Par Harbour was begun in 1829 by Treffry, who needed it in order to export copper ores from his nearby Fowey Consols Mine. The first ships used the port in 1833 and it was finished in 1840. The harbour was connected to the mine by a canal from Par to Ponts Mill. An inclined plane of rails ran from a wharf on the canal to the mine above. Between 1835 and 1842 Treffry had built a standard-gauge horse-drawn tramway system from the canal basin at Ponts Mill through the valley to Luxulyan. It ascended the steep valley side at Carmears by means of another inclined plane, and crossed the Valley at the northern end by means of the Treffry Viaduct.

The tramway system also enabled Treffry to develop Carbeans and Colcerrow granite quarries on the south side of the upper valley. The viaduct was also uniquely used by a leat carrying water to Fowey Consols. Two further granite quarries, Rock Mill and Orchard, operated lower down in the valley. In 1870 these were linked to Ponts Mill by a third tramway along the valley floor, built after Treffry's death in 1850 by the South Cornwall Granite Company. These Treffry era railways, were all horse-worked, they were later called tramways to distinguish them from succeeding locomotive-powered lines.

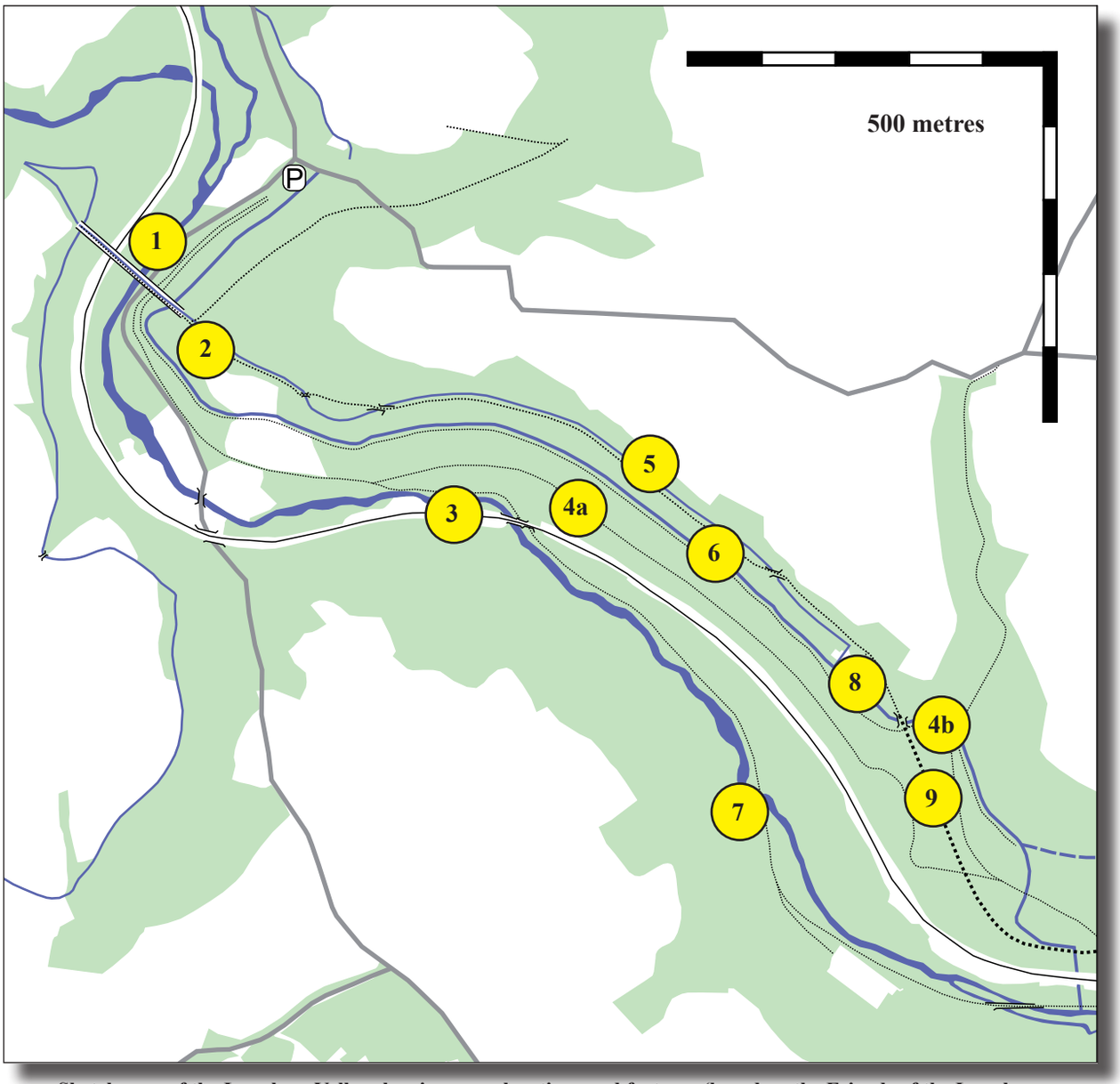
In 1872, William Richardson Roebuck formed the Cornwall Minerals Railway and leased the Treffry Tramways from Joseph Treffry's estate. He acquired the existing lines, formed a new railway to connect them, and extended the line to Fowey. This line was later extended from Luxulyan to

Granite sets in the lower tramway, just east of the Newquay-Par branch line bridge.

Bugle and Newquay, to form the first trans-peninsula rail route in the county, part of the Cornwall Minerals Railway.

The section of the route between Ponts Mill and Luxulyan, with its incline and flat sections built for animal haulage, was replaced between 1872 and 1874 by a more gradually climbing route, more suitable for locomotives, through the valley itself. The newer route is still in use as part of the Atlantic Coast Line, and passes beneath the spans of the Treffry Viaduct that carried its predecessor. The older tramway routes remained in use to serve the various granite quarries until the early 20th century. The last stone came from Carbeans in 1933 but a few sections of Treffry's rails can still be found.

The thickly-wooded terrain of the Luxulyan Valley also played a major part in the early tin mining industry of Cornwall. The woods were important for making charcoal, needed in large



Sketch map of the Luxulyan Valley showing some locations and features (based on the Friends of the Luxulyan Valley guide map):
1. Treffry Viaduct; 2. Crib hut; 3. Par-Newquay branch line; 4a, 4b Velvet Path, lower and upper sections; 5. Carmears Leat; 6. Fowey Consols Leat; 7. Lady Rashleigh Mine; 8. Grinding mill and wheel pit; 9. Carmears Incline

quantities for smelting tin from the rich alluvial deposits on the moors to the northwest. Charcoal-burning platforms have been found close to nearby Prideaux Castle.

The Kendall family of Pelyn House constructed an 8-mile carriage drive through the Valley to Luxulyan to avoid the public roads. The family called this the Long Drive, and it became known locally as the Velvet Path.

Following an archaeological and ecological survey led by John Smith of CAU in 1988, a management strategy was drawn up. Cornwall Council, in consultation with local representatives on the Valley Partnership, continues to manage the site. The Valley Ranger carries out regular work and inspections, sometimes with the assistance of volunteers.

In 1992 English China Clays International (now Imerys) donated the Valley to Cornwall and Restormel Borough Councils, having previously considered opening it as a country park. At the same time, Cornwall Heritage Trust acquired the Viaduct from the Treffry family. The Friends of Luxulyan Valley, a very active group, has dedicated itself to the preservation and protection of the Valley since its foundation in 1996/97.

This is, necessarily, an overall description of the industrial remains of the Luxulyan Valley. The Valley is also a haven for an enormous number of wildlife species, both animals and plants: a list can be found on the Friends of Luxulyan Valley website, www.luxulyanvalley.co.uk. A shorter list, with some illustrations, is in the Friends' book *Luxulyan Valley, a Guide to its History and Beautiful Walks*, available through their website.

The Treffry Viaduct

The Treffry Viaduct is a dual purpose railway viaduct and aqueduct and as such is unique in the UK; it crosses the Luxulyan Valley and is part of the Treffry Tramways. The viaduct was jointly designed by Treffry and William Pease and built by local masons. It is scheduled under

The lofty pillars of Treffry's viaduct either side of the Par River.

the Ancient Monuments and Archaeological Areas Act 1979; due to its poor condition is also on Historic England's Heritage at Risk Register. Treffry had acquired mines on Goss Moor and planned to link them to the port of Newquay via a railway. This larger tramway required a high-level river crossing, which necessitated construction of the viaduct. The viaduct measures 650 feet (198m) in length and 100 feet (30m) in height, and was reported at the time to be the most advanced engineering project in the western peninsula. Construction of the viaduct took place from 1839 to 1842, and it was fully operational by 1845. On the top of the viaduct was a rail track and below this ran the Carmears leat, which carried water to Fowey Consols. On its way down the water also powered the Carmears incline water wheel. This enabled the tramway to pull loads up the incline.. Above the centre pier of the viaduct is the Treffry Coat of Arms. The Treffry Viaduct is owned and maintained by Cornwall Heritage Trust.

Carnmears Incline Overbridge

Treffry decided to use an inclined plane to gain a height of 99 metres from Ponts Mill in one step, rather than in a series of constant grades to Luxulyan. To construct the Carmears Incline he utilised the experience of distinguished engineer, James Meadows Rendel. Horses drew the wagons from the wharf at Ponts Mill to the bottom of the Incline; the horses were then unhitched, and the wagons attached to the wire rope. A large water wheel was placed at the top of the incline, and this drew the wagons up the 1 in 7 (also described as 1 in 8 and 1 in 10) gradient. The incline was 875m long and rose 99m in height and was also built in the period 1839-1842. A massively built granite bridge carries the lower part of the inclined plane over another trackway, now disused, while above the gate is the later (1874) viaduct of the Cornwall Minerals Railway, now British Rail's Par to Newquay branch. Partly hidden by vegetation is a loading bank for vehicles and the rails and wooden sleepers of the later railway at Ponts Mill. The inclined plane at Carmears is one of the best-preserved in Cornwall, and when it was built, was regarded as a civil engineering triumph.

Wheel Pit Mill

The Carmears wheel pit was built in 1841 by to contain the water wheel which originally worked the winding machinery of the Carmears inclined plane. The wheel, fed by the Carmears leat, which flows across the Treffry Viaduct, hauled loaded wagons up the 700-metre-long slope of the incline by means of a wire rope, while wagons descended under their own weight. A 'checker' was employed to control traffic on the incline, and the remains of the checker's hut can be seen at the top. The other, larger, granite building nearby is thought to have been a forge or blacksmith's workshop for the granite quarry or the tramway.

The wheel pit is of dressed granite blocks, and is cut back into solid granite at the rear. It was built large enough to take a 50 foot waterwheel, but only a 30 foot wheel was needed to work the inclined plane. When the tramway system was replaced by the Cornwall Minerals Railway in 1874, the incline was no longer used. The site was too useful to ignore, however, despite its remote location, and around 1890 a china stone mill was constructed on either side of the old wheel pit, and a new 40 foot wheel installed to power it. The hub of this later wheel can still be seen today. The mill was used to crush china stone until the First World War.

Carmears Rocks

When the leat was built in the 1830s to carry water to Fowey Consols mine, the engineers had somehow to convey the water around the face of the Carmears Rocks. This was done by constructing a wooden aqueduct along the front of the cliff; the amazing structure lasted for well over a hundred years, as the leat waters were subsequently used for the stone mills and the generation of electricity at Ponts Mill. In the late 1940s, the aqueduct was replaced by the tunnel we see today. The now dry course of the leat can be seen to the left.

Saturday May 2nd morning

The well preserved rock grinding mill, fed by the Carmears Leat. Two pairs of grinding pans were worked by a central waterwheel, its axel balanced on the two walls.

Modern railway bridge carrying the Newquay-Par branch line over the Par River and the lower tramway. Granite tramway sets can be seen in the former trackway here.

Saturday May 2nd morning

Quarrying

Around the top of the valley were the Luxulyan, Cairns, Carbeans and Colcerrow granite quarries. Within the valley were Rock Mill and Orchard granite quarries, and in 1868 the South Cornwall Granite Company opened a tramway linking them to Ponts Mill. This is what is described as the 'Valley Floor Tramway'. The last stone came out of Carbeans in 1933 and the last section of tramway, from there over the viaduct to Luxulyan, was removed in 1940.

By the early 20th century the Luxulyan granite quarries had been bought by John Freeman of Penryn, but cheap Scandinavian imports hit the business hard. Even so, Colcerrow Quarry, (sold by Kendall in 1925), still used the tramway to transport granite to Luxulyan station as late as 1933.

Mining

While there is a good deal of archaeological evidence for mining in this area its date is not known; some sources suggest that it started around the 16th century. Presumably it commenced by tin streaming and advanced through costeaning and pitting to proper underground mining. The first record however dates only from 1881, when Lady Rashleigh Consols opened. This mine had a capital of £20,000 in £1 shares. The company was dissolved in 1889. The mining operations in the valley were, unfortunately, small and unimportant, and never worked on any significant scale. There are several mine workings in the southern part of the valley (in Prideaux Wood and around Ponts Mill), but these are outside the area of the AGM visit.

The plan of Lady Rashleigh Consols (A.M. R 313 B, 1881) shows (diagrammatically) five lodes, North, Caunter, Symon's Lode (parallel with Caunter Lode), Rashleigh (parallel with North Lode and intersecting Symon's and Caunter), and Kate's (also parallel with North). There is no evidence of work on either North or Kate's lodes. Symon's Shaft is close to the intersection

The Fowey Consols leat just south of the viaduct.

of Rashleigh and Symon's lodes but no workings are shown from it. There are two shafts on Rashleigh Lode, Parker's and Edward's. The former is about 10 fathoms deep and the latter about 5 fathoms, connecting with a short adit.

Luxullianite

Luxullianite (also spelled luxulyanite and luxulianite) is a rare type of porphyritic tournalinised granite, notable for the presence of clusters of radially-arranged acicular tourmaline crystals, enclosed by phenocrysts of orthoclase and quartz in a matrix of quartz, tourmaline, alkali feldspar, brown mica, and cassiterite. In the early 19th century the area in and around the St Austell granite yielded some very striking ornamental stones, and luxullianite was one of the most unusual. A large specimen of luxullianite was found in 1965, forming part of a rockery in front of Carthew House, since demolished to make way for china clay pit development.

Queen Victoria and Prince Albert visited Place House at Fowey in 1846 and were so impressed by the newly constructed Porphyry Hall, which incorporated large slabs of polished luxullianite lining the walls, that the Queen exclaimed "That is magnificent." Subsequently slabs of Tremore Porphyry and other ornamental granites from the St Austell area were presented to the Queen by Treffry and incorporated into the fabric of Osborne House on the Isle of Wight. The luxullianite and other stones were cut and polished at "The Porphyry Works", situated at the Fowey Consols. For a long time no in situ occurrences were known but, in recent years, quarrying at Tregarden quarry, close to Luxulyan has revealed a vein of luxullianite. A superb example may be seen in the Duke of Wellington's tomb in the Crypt of St Paul's Cathedral.

Luxulyanite: Wikipedia image. Localities for this rock have all but disappeared; small specimens occasionally appear online but they are very expensive.

St Austell Brewery

The St Austell Brewery was founded by Walter Hicks. In the 1851 census he was described as a landed proprietor but (probably) by the end of the year he had become a maltster. Hicks took out a mortgage of £1,500 on Lower Menadue (the family home and farm) to provide the start-up costs. The mortgage was most likely arranged with the East Cornwall Bank (Robins, Foster, Coode and Bolitho, later to become Barclays) in St Austell. The exact location of Walter's first malt house is unknown, but was somewhere in the Trenance area – either at the farm or nearby in the valley.

There is no evidence to suggest that Walter was brewing at this stage, but as he would have supplied malt to many of the ale houses and inns in and around St Austell which brewed their own beer, no doubt he was gaining valuable insights into the business. Within ten years Walter had married Emma, the daughter of St Austell draper Benjamin Andrew, and moved his business to Church Street in the centre of the town, just down from the White Hart Hotel. By now he was trading as a wine merchant as well as a maltster, and it was not long before he had driven his local competitors (initially six maltsters and three wine and spirit merchants) out of business.

Hicks acquired the Seven Stars Inn around 1863; within a year he had begun the long and complicated process of buying the old London Inn on Market Street; due to its shared ownership this was not completed until 1870. It was an extensive site, the inn itself having sixteen rooms, a large cellar, a brew house, yard, stable and loft. In 1869 he began to build his new Steam Brewery and a house for his growing family, on the main site of the London Inn just up the hill from the parish church; the old brewery building survives as offices.

In 1893 the Brewery moved to its present premises on the north side of Tregonissey Lane (now Trevarthian Road) by which time the business was being run by Walter Hicks junior. The land belonged to the Sawle family and on the 20th of June 1893 Hicks senior was granted a 99-year improvement lease for the land, the signatures being witnessed by Henry Wenman, "Butler to Sir Charles Brune Graves Sawle." Just three days later the tender from A. R. Lethbridge and Son, of Tracey Building Yard, Plymouth, for the erection of a new brewery was accepted; the architects were Messrs Inskipp and Mackenzie, of London. The cost was thought to be between £7,000 and £8,000, the building to be completed within a year.

The 1893 brewery is a classic 'tower' brewery of the period designed by specialist London brewery architects, whose other work included the great Anchor Brewery near Tower Bridge. Equipment dating from the opening of the Brewery remains in use today. The new Brewery used steam to heat the mash, rather than direct heating by furnaces (hence the name Steam Brewery) and a new form of refrigeration system. In 1870 the *West Briton* described the Brewery as consisting of:

> four storeys, the upper being fitted with three bins each capable of containing 100 bushels of malt, also two furnaces sufficiently large to hold 2,000 and 1,000 gallons. By a new and admirable apparatus the mashing is most successfully carried on. The next floor has two large receivers. After the beer has been boiled it is poured into these vessels in which it passes to the next flat and immediately falls on a patent refrigerator. This ingenious and useful appliance is made of a number of copper tubes and perpendicularly set, through which cold water is constantly running, as soon as the beer drops off it is then passed at its required temperature into the vats... The brewery is well supplied with spring water which is pumped by a steam engine of 3hp. The cellar is very capacious.

A new belt-driven malt grinding mill was purchased from Adlams, and is currently on display at the Brewery. Built in 1890 this machine was finally retired in 2011. One of the fermentation vessels, made by Ernest Mathews and Co., also dates from this period. The older of the two mash tuns was made by Llewellins and James, and installed in 1914. The remaining 40-barrel steam-

heated copper is part of the original Brewery plant.

By this time a further eighteen pubs and hotels had been acquired, between Gwennap and Tavistock; their individual brew houses were closed down in order to concentrate brewing in St Austell. By 1910 the Brewery estate had grown to 54 pubs and hotels and several more leaseholds and yearly tenancies, plus stores to aid distribution in Plymouth, Truro, St Blazey, Camborne and Penzance. The number of public houses in Cornwall dropped by the end of the 19th century; the number of on-licences also decreased. Two of the reasons for this were the rise of Methodism combined with the temperance movement, and the shifting and loss of the mining industry. An interesting statistic for 1892 however, was that two-thirds of the county's convictions for drunkenness had occurred in the parish of St Austell! The Miners Inn at Nanpean and the Mount Charles Inn at St Austell had particularly poor reputations.

The first mechanical transport was Foden and Straker steam wagons, acquired in 1906. In 1910 the Hicks's decided to register the business as a limited company, forming Walter Hicks & Company. The Company was registered on the 17th of January with a capital of £100,000 in £10 shares. The first directors were Walter Hicks senior (governing director) and Walter Hicks junior. The company was to "take over the business of a brewer and wine and spirit merchant carried out by W. Hicks, sen., at St Austell, Cornwall, and elsewhere."

Unfortunately Walter Hicks junior was killed when his motorcycle collided with a car in Helston on the 20th of April, 1911. With no male heirs to take over the company it fell to Hicks' eldest daughter, Hester, to take over the company. Hester was then 45 years old, having married Thomas Parnall six years before. Hester was remembered her as a woman of strong character, and was described by one of her nieces as "clever, witty and utterly unscrupulous."

The Brewery's capacity was greatly increased after her arrival, the new building and new plant installed between 1912 and 1914 doubled the capacity to four times what it had originally been. An extra copper room was built to house a new 100-barrel copper, replacing one of the original 40-barrel coppers, and a new enlarged fermenting room was added. Unfortunately the outbreak of war curtailed this expansion; however by the end of the decade output had risen to 38,000 barrels a year, twice what it had been before the war. Walter Hicks missed all this, having died on the 4th of April 1916, at the age of 87; Tom Parnall had died the previous year.

Considerable expansion occurred under Hester Parnall's leadership, with the staff increasing from 62 in 1910 to 80 in the late 1930s, and she also added another 79 pubs and hotels to the chain. Until the 1920s, properties within a twelve-mile radius of the Brewery were supplied by horse and dray, with the railway system used for places further afield. Up to 20 horses were kept at the company's stables, and some of their names are recorded in old account books: Polly, Harold, Lion, Madam, Joey, Beauty, Kicker, Princess; mangolds as part of their diets were supplied from the family farms at Lower Menadue and Menacuddle.

In July 1923 the directors decided to acquire "a two-ton and a five-or six-ton Leyland lorry. Horses to be disposed of as soon as big lorry is delivered." The first petrol vehicles were two Federals, two Maxwells and a Thornycroft. Despite this, horses were still used to deliver from certain stations to pubs in more rural areas. In 1927 the Brewery acquired its first crown corking machine, second-hand, for £40 from the Friary Brewery in Guildford.

In 1928 the Great Western Railway offered to cart all goods between the station and the Brewery at 2/6 per ton, but Hester considered that whilst the Foden was still running it was cheaper to use the company's vehicle. At that time the annual cost of running the Foden was estimated at about £500 a year.

In 1930 motor transport was being hired in Penzance because the horse had died, suggesting that some work to the road fleet was still needed. In 1934 the company bought Christopher Ellis & Son's Steam Brewery at Hayle, together with its estate of 30 licensed premises, for £50,000 (£3.121 million in November 2025). In the same year the name of the company was changed

to the St Austell Brewery Company Ltd. This information was spread about the management beforehand in order to draw down on all stocks containing the Walter Hicks & Co. livery. The Ellis Brewery was closed on acquisition, and became the St Austell Brewery's main depot in West Cornwall until its closure in 2006. Christopher Ellis junior joined the Board of St Austell Brewery as a salaried director, and preferential shares were issued to members of the Ellis family. The decade ended with the death of Hester Parnall, on the 20th of April 1939, at the age of 73.

Two months later a serious fire broke out in the garages in the yard, supposedly caused by a Thornycroft lorry overheating. Unfortunately this was the day before the Royal Cornwall Show, and all of the lorries were loaded up with beer ready to be taken there the following morning. Extensive damage was caused to the garages (formerly the stables), the carpentry and paint shops, the fitters' shop, the paint store and timber store, along with the gatekeeper's cottage. Unfortunately for the company and the historian, many old Brewery records, which had been stored in boxes in upstairs rooms, were lost in the fire.

A St Austell Brewery Morris Commercial FV Dray from the late 1940s. The truck was powered by a 4.3-litre six cylinder diesel engine produced under license from Adolph Saurer AG. More commonly on the domestic market it was fitted with a four-cylinder Morris petrol engine delivering a claimed maximum 80 bhp of power.

World War 2 brought mixed blessings to the company, with some of the workforce being called up and the transport fleet being requisitioned. On the other hand brewing was classed as an essential food industry; while excise duty was high, beer was not rationed, and breweries were encouraged to increase production in order to supply the troops and to maintain morale on the home front. In 1943 the Brewery joined forces with its chief rival – the Redruth Brewery – to buy the Treluswell Brewery Company and its twelve tied houses. The Brewery was able to add six houses to its estate for a total of £15,000. Four more were bought during the war, three of which were important old coaching inns on main roads through the county: the Victoria at Roche, the London Inn at Summercourt and the Victoria at Threemilestone. After the war a programme of improvement and modernisation commenced under the new managing director George Luck. The programme also included a new company design, which included the Cornish coat of arms, the bezants coloured with gold leaf; new pub signs were also commissioned.

1951 saw the centenary of the Brewery, and a special Walter Hicks Centenary Ale was

produced, alongside Centenary Port and Sherry. Around this time it was decided to expand the wines and spirits department. This included increasing the range of each bottled at the Brewery, and producing some with Brewery labels. These labels were the first appearance of the castle design, the castle taken from a memorial tablet at Luxulyan Church. The own brands now include: Pendennis, Tintagel and Castle D'Or Sherries, Walter Hicks Gin, Montpelier Plantation White Rum, Walter Hicks Navy Rum, Sabre Vodka, Mena Dhu Whisky and Western Hunt Ruby Port.

The Brewery's first keg beer, Extra, was introduced in 1953, essentially as competition for Watney's Red Barrel. The outlay on producing this was quite large, a report in 1954 estimating it to be about £20,000 (about £480,000 in 2025). Extra became very popular; in 1960 it was on sale in London at Moore's Restaurant in Throgmorton Street and in 1976 it won a prestigious gold medal at a national beer competition run by the *Sunday Mirror*, against 312 beers from 88 other breweries. In 1985 its name was changed to Duchy, which had been used for the bottled version of Extra since 1954.

In 1969 the Brewery built its only purpose-built pub, the William Cookworthy, just off Tregonissey Road on what was then still the eastern outskirts of St Austell. Unfortunately this was converted to a Tesco Express sometime between July 2011 and May 2015, the building structure itself remaining unchanged but with a new facade. In the mid-1970s the Brewery reached its peak barrelage since the war, coinciding with exceptionally good summer weather and the tourist boom (Cornwall's visitor numbers also peaked in the 1970s). In 1973 the storage capacity for wines and spirits was greatly increased during major building works at the Brewery.

During the 1980s a strategic policy was put in place to expand the Brewery's estate. Key acquisitions had been the Pandora Inn at Restronguet, the Great Western Hotel at Newquay and the Old Customs House at Padstow which all proved very successful; the Brewery now looked to expand into Devon. Over the next twenty years depots serving the free trade were opened up

Cask filler. Fills casks with measured quantities of beer to go to the pubs. ***Photo: Steve Barber.***

Yeast culture tanks. Yeast is pitched (added) to the cooled wort to ferment the sugars into alcohol and impart flavours. ***Photo: Steve Barber.***

in Ilfracombe, through buying the Drink Link company, and in Newton Abbot; fifteen Devonian houses were also bought – the furthest east being the Mill on the Exe at Exeter.

In 1992 the Brewery opened its first Visitor Centre, catering to the growing interest not just in beer and brewing generally, but a specific interest amongst tourists and locals alike. In its early days, the Visitor Centre included an off-licence, sample bar and gift shop, as well as offering guided tours of the Brewery. In 1993 the Brewery took one of the most significant steps in its history when it bought Carlsberg-Tetley's wholesale business in Cornwall and the Isles of Scilly.

At the start of 2001 the Brewery bought its 152nd pub – the Victoria Inn in Salcombe – for £1 million. Investments were also made in the larger managed houses, the Central in Newquay, the Old Customs House in Padstow and the Pedn Olva Hotel in St Ives have had considerable sums spent on their redevelopment. In the new millennium the Brewery made a commitment to its four core draught ales (HSD, Tinners, Tribute and IPA) and to a seasonal beer programme based on six new short-term brews a year. In addition, the Brewery was then still producing the sadly missed XXXX Mild which won a CAMRA Best Beer award in 1990 and as one of the few remaining draught milds still being brewed in the country.

The Brewery's flagship hotel, the Great Western at Newquay, was refurbished in 2008, and a new 33-bedroom hotel extension to the County Arms in Truro opened in June 2011. On 1 July 2016 St Austell Brewery acquired Bath Ales. In March 2017 a multi-million pound investment in a new brewery and larger bottling and canning facilities at Bath Ales was announced. Chief executive, James Staughton, described the rationale of the investment as "to de-risk the business away from the seasonality of Cornwall. The further east we go, the more we're focused on city centres and the less seasonal the business becomes."

In 2001 St Austell was one of around 35 independent regional family breweries still brewing;

Grist case and Steele's masher. The cracked malt is mixed with hot liquor (water) and fed into a mash tun. ***Photo: Steve Barber.***

by 2021 the number was reduced to 28.

The brewery's flagship beer is Tribute Ale, which accounts for around 80% of sales. Other popular ales include Proper Job, Tinner's Ale and Duchy Bitter. The company remains renowned both for its quality beers and its well maintained pubs. Tribute, originally brewed as Daylight Robbery for the 1999 total eclipse, is now a popular guest beer in public houses throughout the country, while HSD (Hicks Special Draught) is a strong bitter of great character. The brewery opened a visitor centre in 1992 and also arranges tours. The original plot on which the brewery was built measured "two acres and three roods or thereabouts;" growth and new building in the last hundred years has seen the brewery site expand to some fourteen acres today. At the present time the brewery owns over 160 pubs and hotels in Cornwall and Devon and sells over 40,000 barrels of beer annually.

Beers

Tribute was launched to commemorate the 1999 solar eclipse. It was originally a one-off special named Daylight Robbery, but proved to be so popular it was reintroduced as Tribute and has since won several awards around the UK. St Austell Brewery signed a deal in 2008 with Healey's Cornish Cyder Farm, near Truro, to help keg and distribute Rattler Cyder and Rattler Pear Cyder for five years. St Austell Brewery also produces Cornish IPA, which is bottle-conditioned and sold in Marks and Spencer stores and its other products include:

Proper Job IPA (4.5% cask, 5.5% bottled) - also sold as M&S Cornish IPA at a strength of 5%

Black Prince (4%)

HSD (Hicks Special Draught) (5.0%)

Trelawny (3.8%)

Dartmoor Best Bitter (3.5%)

Saturday May 2nd afternoon

Korev Cornish Lager (4.8%)
Mena Dhu (Cornish Stout) (4.5%)
Anthem British Pale Ale (3.8%)
Tribute Extra Strong Pale Ale (5.2%)
Black Square Imperial Stout (11%)
Bad Habit (8.2%)
Sayzon Belgium Farmhouse Ale (5.9%)
Secret Santa (4.3%)[12]
Big Job IPA (7.2%)
Tribute Cornish Pale Ale (4.2%)
Cornish Best (3.4%)
Proper Black Black IPA (6.0%)
Cardinal Syn (7.8%)
Divine Intervention (13%)
Baobab Wheat Beer (5.3%)

The brewery previously produced the winter warmer Cripple Dick (11.7% ABV)

As of the 22nd of October 2023 the brewery had 9 pubs in St Austell, 5 in Falmouth, 4 in Fowey, 6 in Newquay, 5 in Penzance, 5 in St Ives, 5 in Truro and 121 elsewhere in Cornwall, also 5 in Exeter, 28 elsewhere in Devon, 8 in Somerset and Bath, and 9 elsewhere in Scilly and the South West, a total of 210.

Castle-an-Dinas

In the 19th century tin streamers located wolfram between Mawgan Porth and the northern slopes of Castle-an-Dinas hill. Tin had been raised from this area as early as 1836, with 25 tons of black tin produced in 1875. This tin was from thin stringers traversing an elvan.

A mining lease was acquired from the Duchy of Cornwall and the lode proved in several places by costeaning in 1915. A prospecting shaft was sunk 400 feet from centre of the hill in July that year. A shallow level was started from a point 120 feet further north, and driven south towards the shaft. The lode was found to be three feet wide, carrying 2.5% WO_3 (tungsten trioxide) in the form of the mineral wolframite. The lode trended N 18° E and was nearly vertical. The country rock is killas of the Meadfoot Beds, intruded at depth by a small boss, or cupola, of the St Austell granite.

Wolframite was formerly regarded as a mineral in its own right, with a formula of $(Fe,Mn)WO_4$. It is now described as a solid solution series, with an iron-rich end-member, ferberite ($FeWO_4$), and a manganese-rich end-member, hübnerite ($MnWO_4$). Wolframite may contain any proportion of the two end-members. Wolfram is the German word for tungsten, however throughout this article (and historically) it is an abbreviation for worlframite. The mineral is usually seen as black masses or crystals and has been found throughout Cornwall, from St Just to Gunnislake. The Redmoor tin-tungsten deposit, abandoned after the tin crisis of 1985, is once again being examined.

To obtain finance to work the lode, a company, Great Western Ores Limited, with capital of £15,000, was set up in 1916. A lease was acquired from the Duchy for 21 years from September 29th at a 5% royalty. No.1 Level started around this time further north and a shaft was sunk to meet it. Progress was slow however and Josiah Paull, manager of South Crofty, was taken on as the consultant engineer.

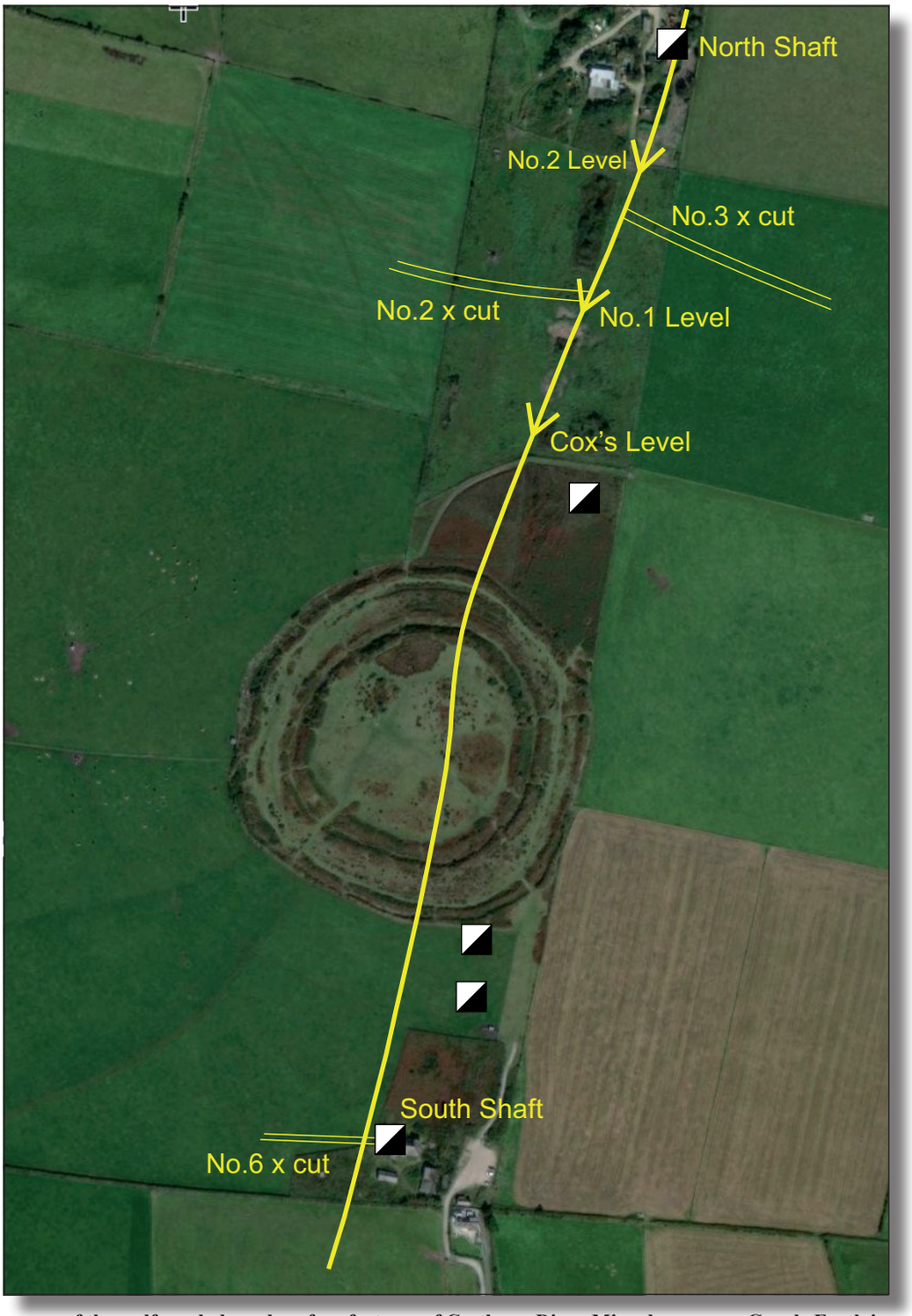
The mill was erected early on, and the buildings were probably bought from Goss Moor Alluvials, about two miles to the south. An attempt had been made to acquire some equipment from Holmbush Mine but this was unsuccessful, as it was hoped that that mine might restart. An area for dumping tailings was identified; this was also on Duchy land but outside the lease area. Buildings and plant were eventually acquired from West Kitty Mine at St Agnes; other individual bits of kit came from other sources. The mill was effectively completed in December 1917 and fully operational the following January.

In 1918 the mine was bought out by South Crofty Limited because of financial problems. During 1919 the mine treated 3,349 tons and produced 41 tons 8 cwt of wolfram, an average of 27.72lbs/ton, which sold for £6,380. Unfortunately the mine was suspended in December 1920, owing to the low price of tungsten, and the mill was put onto care and maintenance.

Wolfram prices began to rise again by the middle of 1929; at the end of this year Josiah Paull retired and was replaced by his son Clarence. By the middle of 1930 the levels were cleared and the mill was treating 40 tons per day. Low prices forced a brief closure in 1932 however. Following the reopening the next year the mine would operate continuously until 1957.

During 1940 a programme of diamond drilling was carried out from the ends of the prospecting crosscuts on the No.2 and No.3 Levels. A quartz vein was intersected 600 feet to the east of No.3 Level and another vein, two feet wide, 450 feet to the west of No.2 Level; the latter contained traces of wolfram. Both of these were in the killas above the granite. Other crosscuts failed to find anything of interest. The result of this work was that

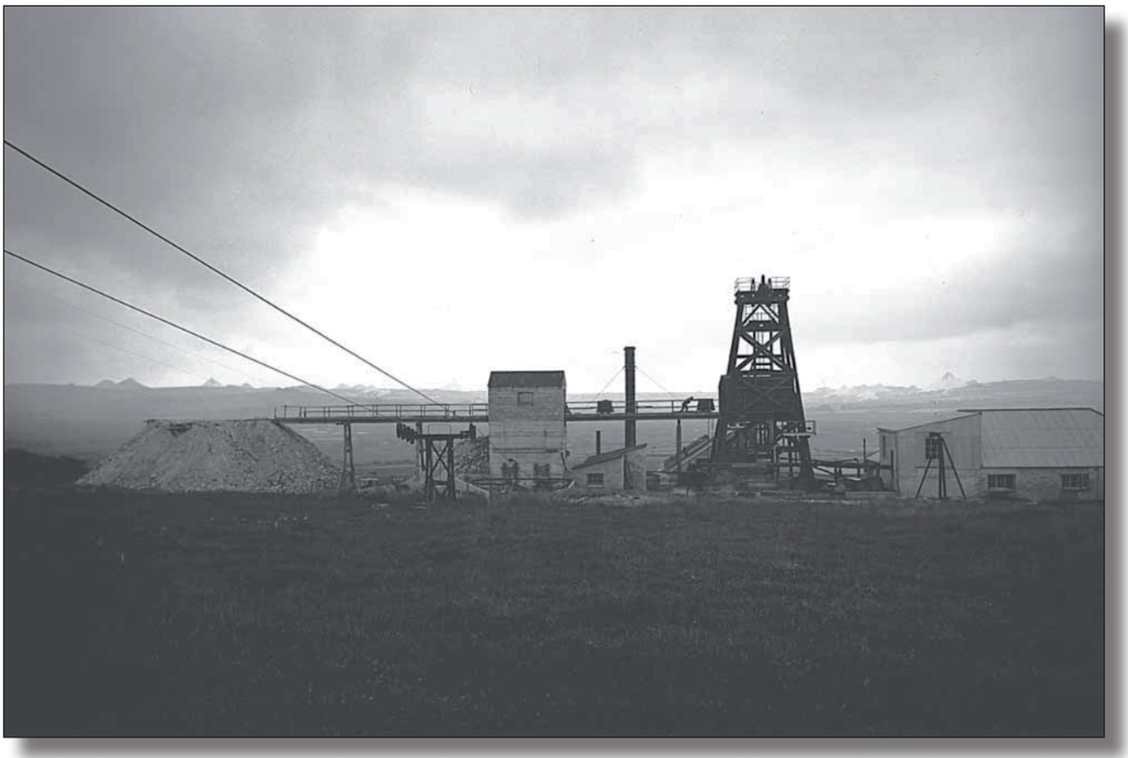
1. There were no parallel structures
2. The wolfram occurred in the lode close to the granite
3. The lode in the killas below No.4 Level should contain wolfram



The course of the wolfram lode and surface features of Castle-an-Dinas Mine drawn on a Google Earth image.

As the lode to the south appeared to offer the best prospects it was decided to sink a new South Shaft, south of the granite. At a later date it would then be possible to drive north into the granite. The shaft was planned to be 400 feet deep, and, to speed up progress, it was decided to sink from surface and raise against it from No.4 Level. The shaft was completed to surface on Christmas Eve 1941.

The Wolfram Lode. This exposure, in the back of 5th Level, south of New Shaft shows the lode, about 2 feet wide, of white quartz, with clusters of wolfram crystals along its margins. The killas country rock adjacent to the lode is tourmalinised for a foot or so and, beyond, is white, soft and friable.



New Shaft, at the southern end of the workings, on the southern slopes of Castle-an-Dinas hill. The horizontal beam on the right of the headgear operates the pump and the hoisting engine house is behind the headgear. Trucks from the shaft cages are run along the gantry to dump waste rock on the left, and the ore is tipped into the ore-bin (centre) from which it is conveyed to the mill at North Shaft by overhead ropeway.

Prior to sinking this shaft, all stoping was, remarkably, carried out by manual labour, *i.e.* by hand-drilling. As there was a shortage of labour, and the fact that the rock was becoming harder in depth, it was decided to increase compressor capacity so that all future drilling would be by machine. It was also decided to install a steam winder for hoisting. There was no National Grid supply to Castle-an-Dinas at the time and it was also thought then that steam hoisting was cheaper than electrical in shallow mines. Castle-an-Dinas thus acquired a second-hand engine from the School of Mines at Troon; this had been built by Holman Brothers in 1906 for King Edward Mine. The 10″ by 15″ coupled geared twin drum engine had gone into service at King Edward in 1908. It returned to KEM in 2008, a century after its removal, and a replica timber house was built around it in 2010, the original having burned down in 1958. At Castle-an-Dinas a Lancashire boiler was supplied by South Crofty, there being no suitable Cornish boiler available.

Pumping was by a Cornish pump which was driven by one of two Ruston & Hornsby diesel engines, the other used to for the compressor. The 12″ pumps were built at Bartles Foundry, Redruth and the pit work was designed by one J. H. Trounson. A Pulsometer steam pump, used during shaft sinking, was retained as backup to the Cornish pump.

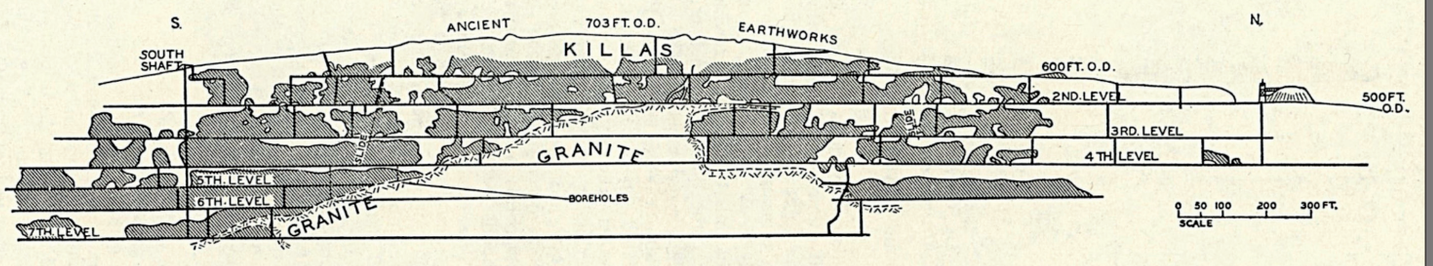


FIG. 35. *Castle-an-Dinas Wolfram Mine.*

Section showing the granite intrusion.

Based on a section supplied by South Crofty Ltd.

By February 1943 the shaft was 140 feet below adit, but a large amount of water was being pumped; the water had first been met with when a fault was intersected at 45 feet below adit. The shaft was sunk on four six-hour shifts with four men on each shift. It reached its final depth, 218 feet below adit, around the end of the year.

In 1946 the workforce was reinforced by Polish workers who could not, or would not, return to Poland as it was now under Russian control. In 1948 a fall of ground in No.4 Level resulted in the blockage of the main drainage adit and the temporary cessation of pumping.

By 1950 the lode was being developed south on six levels; it had become poor and split into strings, and the limit of payable ground had obviously been reached. No.7 Level had also been driven north to locate the ore found in No.4 Level; however the granite ran farther north than was expected, and the level did not locate any ore ground. A raise was put up 90 feet, which broke through the granite into the lode, and a new level, named Intermediate, driven north. This level was driven to within 450 feet of North Shaft. The lode here was poor, and diamond drilling suggested that there was little likelihood of any reserves below the level.

In the summer of 1952 the mine was finally connected to the National Grid and the surface compressor and submersible pump in No.7 Level were connected to it. However production was declining, the 7,840 tons milled during the year producing only 26 tons of concentrate; almost all of the mineable reserves were now exhausted. By April 1954 the shaft was 480 feet deep and the No.8 Level was driven 220 feet north and south of South Shaft.

By May 1957 all of the payable parts of the lode above No.8 Level had been stoped out and

the level was allowed to flood. North of the granite the Intermediate Level was extended to a point 135 feet north of North Shaft, although the shaft itself only reached the No.4 Level. A good deal of stoping was carried out above No.4 Level, but the mineralisation was weak. Geochemical exploration by Professor Ken Hosking of the Camborne School of Mines indicated the presence of a lode to the west; a crosscut was driven 200 feet along a fault but met with no structure. With a low price for tungsten, combined with reduced tungsten values and low reserves, the mine was closed suddenly, the last operations being on Friday the 2nd of August. Some men returned to the mine on the 5th to remove equipment, and pumping ceased on the 9th. Many of the younger men moved on to the china clay industry, which was expanding at that time.

Year	Tonnage crushed	Wolframite conc. Tons	cwt
1918	3500	46	10
1919	3349	41	8
1920-29	Suspended		
1930	n/a	134	12
1931	n/a	100	0
1932	0	0	0
1933	n/a	11	0
1934	n/a	181	9
1935	n/a	208	10
1936	n/a	188	14
1937	n/a	121	16
1938	n/a	212	1
1939	n/a	152	15
1940	n/a	150	3
1941	n/a	93	18
1942	n/a	70	12
1943	n/a	24	10
1944	n/a	88	14
1945	n/a	106	17
1946	n/a	89	2
1947	n/a	66	2
1948	n/a	37	15
1949	7500	64	2
1950	7540	60	18
1951	7390	44	3
1952	7840	25	17
1953	n/a	n/a	n/a
1954	n/a	59	5
1955	7275	48	8
1956	6425	44	10
1957 (Jan-Aug)	3360	20	0

Acknowledgment: It is impossible to write about Castle-an-Dinas without constant reference to the definitive history of the mine, *Castle-an-Dinas 1916-57*, by Tony Brooks. The use of this material is gratefully acknowledged and the book highly recommended to those who would know more.

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