British Mining No. 20

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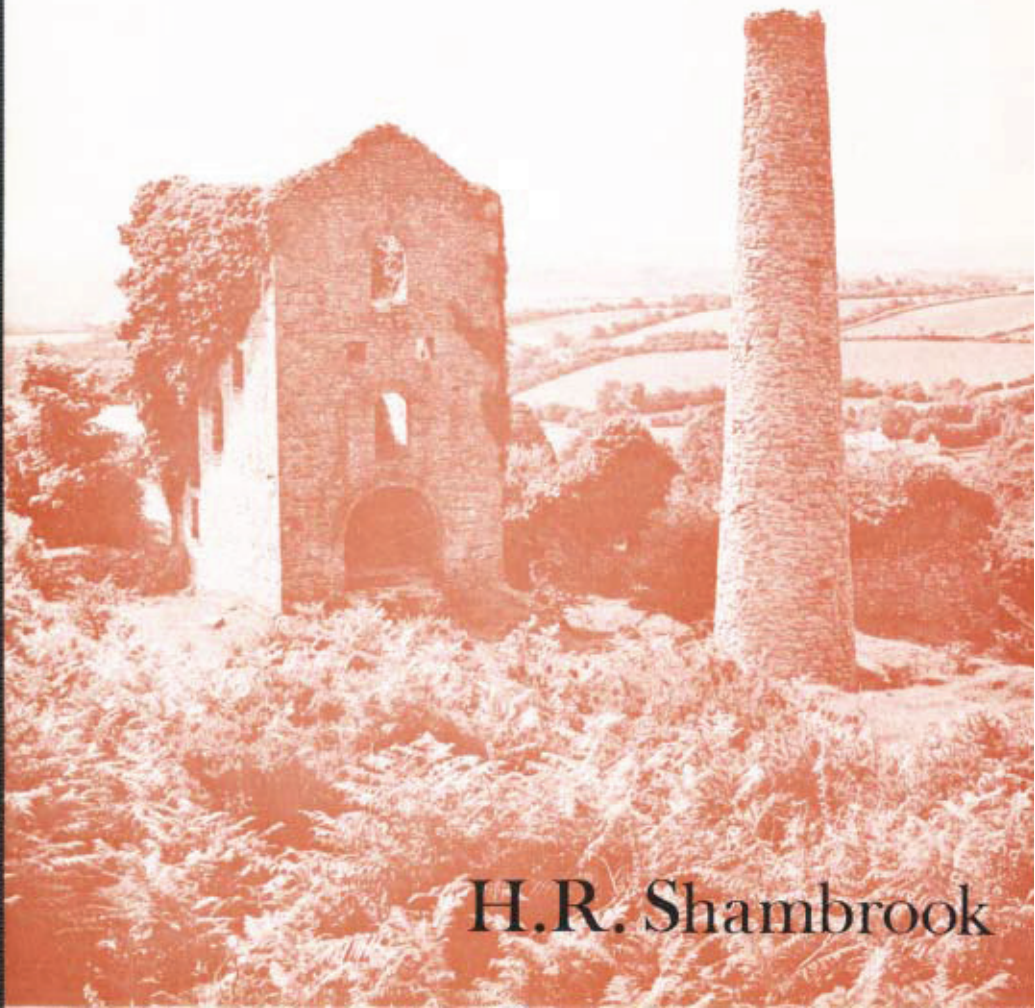

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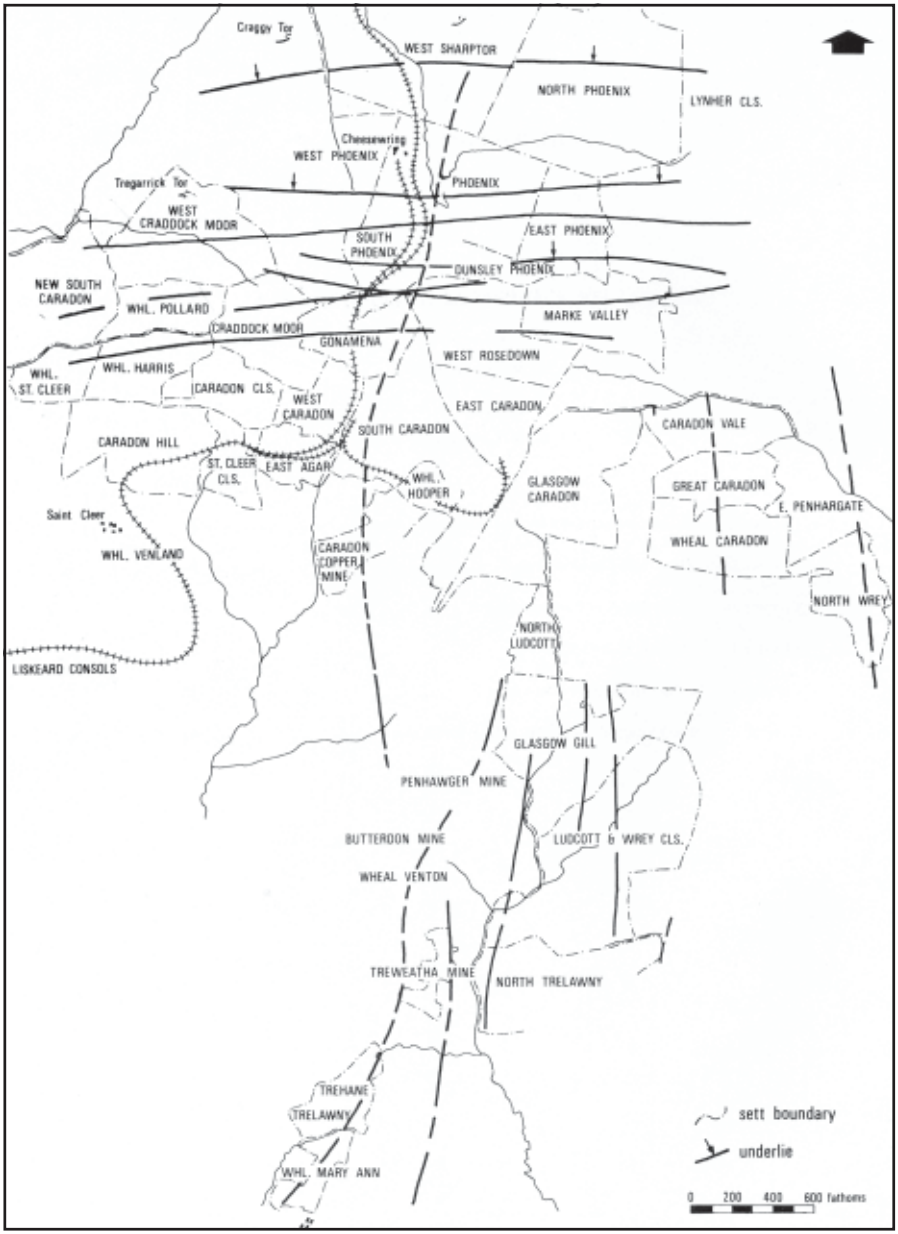

Figure 1 - Sketch of Liskeard Mining District, 1863.

CHAPTER 1

A BACKGROUND GEOGRAPHY AND GEOLOGY OF AREA

Geography

If one is standing at the East Cornwall village of Dobwalls (NGR SX 216650) on the main A38 west from Liskeard. and looks in a NNE direction, a high, rounded and barren hill will be seen in the distance and from the observer's now very pastoral surroundings it is difficult to realise that on that lonely and isolated hill and its immediate surroundings, there existed over 25 copper and tin mines, their gaunt remains now reflecting one character of the surrounding moorland and are a memorial to the arduous life of the Cornish Miner. This south-eastern corner of Bodmin Moor, from the latitude of Rilla Mill in the north to a little south of Crows Nest was for 50 years the third largest copper producing area in the West of England, with a recorded output of 625,000 tons.

The most productive mines are situated within the granite outcrop or at its margin, and fall largely into two groups; that on the south side of Caradon Hill, comprising South, West and East Caradon, Gonamena. Tokenbury (later Glasgow Caradon), and Craddock Moor mines, which were all large copper producers. The Phoenix group on the north includes Phoenix United, East Phoenix, Clannacombe, Stowes, Dunsley Wheal Phoenix, West Phoenix, Darley (North Phoenix), Marke Valley and West Sharptor, and with the exception of Marke Valley – mainly a copper producer – these were tin producers as well as copper. Fig. 1 shows the setts (including those concerned with lead and silver in the south) and lodes of importance in 1863 as well as the railway as it then was.

Excluding the tin streaming work at Oakbottom near Darleyford, and Darley Stream Works nearby, both north of Caradon Hill, the area had been of rough pasture and it was not until 1836 that a sett, later to become famous as Phoenix United, was acquired with five others adjoining by the Cornwall Great United Mining Association, a London based concern which also had similar interests in West Cornwall. Tin was the raison d'etre for the Association's interest in the area, tin streaming works having long been set up in the vicinity, whilst open-works had been excavated at Gonamena. Shallow lode mining first commenced at West Rosedown and Wheal Jenkin nearby. Exploratory adits being driven over a wide area from Sharptor southwards to the future Phoenix and South Phoenix mines. At first indications of copper were unknown or ignored, and it was not until the riches of South Caradon were discovered in the western flank of Caradon Hill, carved out by the Seat on stream, that the area became famous for the red metal.

Both Phoenix United and South Caradon were deep as well as being very extensive, Seccombe's shaft in the former being sunk on a 20^{o} southerly underlie to the 220 fathom level; the Old Sump shaft in South Caradon was vertical to 20 fathoms and

on the underlie to 250 fathoms and later (1907) Prince of Wales shaft was sunk vertically to the 212 fathom level.

Phoenix was in keeping with its mythological namesake, being all but abandoned in the 1860s when its copper horizon was bottomed, but resurrected by William West the engineer through whose persistence the tin lodes were cut in depth. From a very insignificant beginning on a very modest outlay of £640, South Caradon became the third largest copper producer, in tonnage, in the West of England with a recorded output of 217,000 tons. South Caradon was remarkable also through being owned and controlled by its original discoverers to the very end.

At the height of the area's prosperity (1850-1860s) successive waves of miners moved into the area from the declining mines of West Cornwall. New townships grew up around the mines - Tremarcoombe. Higher Tremar, Crows Nest, Minions, Darite (formerly Railway Terrace), Caradon Town, Darley, Henwood and Mutton Corner, whilst existing villages were much enlarged - St Cleer, Pensilva (formerly Bodmonland), Linkinhorne, South Hill and Upton Cross.

Such were the conditions which existed in the area, that villages resembled the mining camps of Moonta or Ballarat in Australia, the Klondyke, "Washoe" i.e. Virginia City in Nevada, or Butte in Montana. Lawlessness abounded, inns and 'Beer Shops', 'Kiddlywinks' and 'Gin Houses' mushroomed, with a comparatively small village such as Caradon Town possessing four such inns within 300 yards; the "Sportsman's Arms" at St Cleer was also the local "lock up".

The effects of the great copper recession in 1866-1880 was perhaps more profoundly felt in the area than elsewhere in Cornwall, since from a thriving village of 500 souls Caradon Town soon became a mere hamlet with numbers of children in school falling year after year and families moving away. The majority of Caradon miners moved to the Far West of America (there was a Caradon mine in the Black Hills of South Dakota), houses became derelict and inns closed one after another but its one chapel, United Free Methodist, struggled gamely on until 1927, when finally through lack of support, it too closed its doors for the last time.

Geology

The granite of the Caradon/Phoenix area is of medium grain, and is composed of porphrytic or orthoclase crystals, abundant quartz, little plagioclase, two micas, and minor amounts of tourmaline. Although most of the mines are sited on the granite outcrop, some are in regions where the granite is overlain by up to 300 ft of the Upper Devonian Killas, as at the Prince of Wales shaft of the Phoenix Mine.

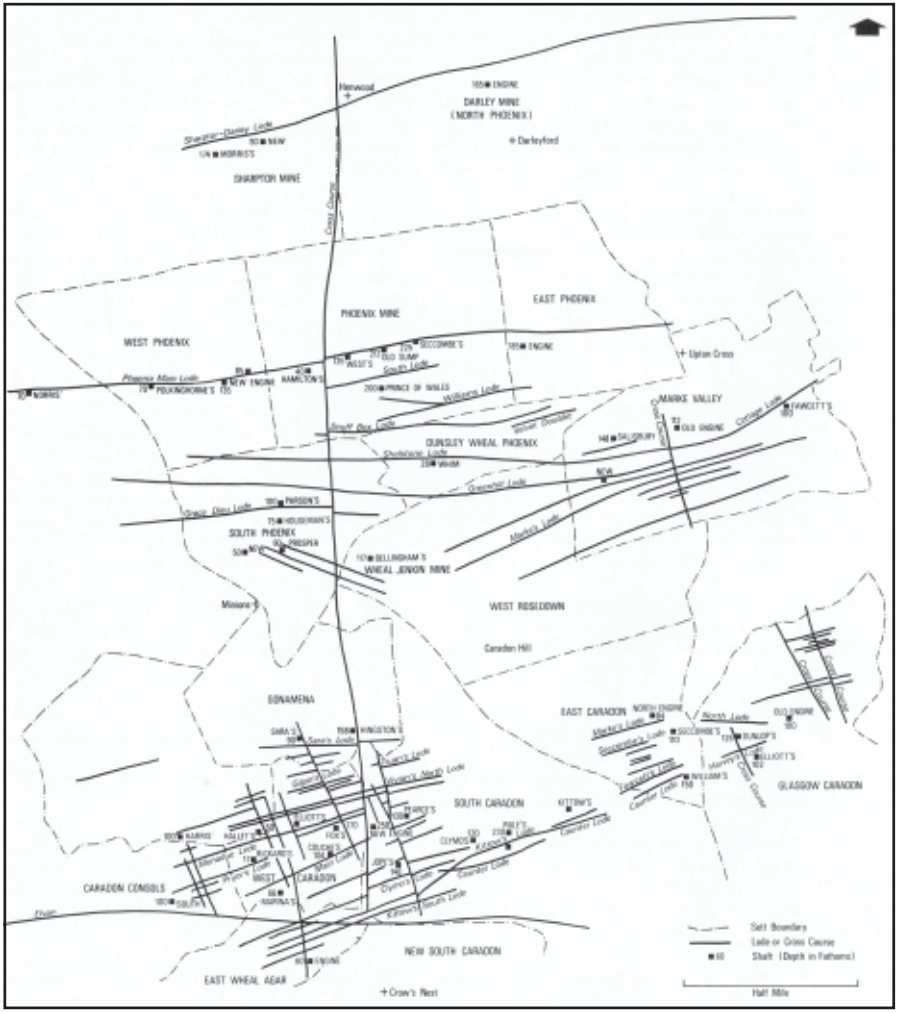

Figure 2 - Principal Lodes, Setts and Shafts of Caradon and Phoenix Mining Area.

The major crosscourse in the area is 5 to 6 miles long and approximately in alignment with the Seat on Valley, trending N 20° W in the Rosecraddock area (NGR SX 268679) near St Cleer, trends N 10° W between South and West Caradon mines, Gonamena and Phoenix United, and becomes almost due north in the vicinity of Henwood Village (NGR SX 267734). The vertical displacement of lodes at the cross-course is variable, at South Phoenix it is 17 fathoms south but rather less at the Sharptor fault.

Associated with the major cross-course, are numerous minor faults all trending between N 5° and 15° W, most of these are in the southern part of the area - the South and West Caradon setts - although a small but important group occur in the eastern part of the area in the Glasgow Caradon, East Caradon, Ashlake, Pensilva and Penharget setts. This latter group are the probable extensions of the N-S lead and silver lodes of Wheal Mary Ann, Ludcott, Wrey, Trelawney and Treweatha mines in Menheniot, which produced prolific tonnages of those ores; attempts were made to recover these in Cargibbit, Penharget and Caradon and Slade lines situated on these crosscourses but little or no production is recorded.

Cheesewring Quarry in the northern part of the area, is also traversed by two sets of nearly vertical fissures trending N 5° - N 20° W. These in turn are faulted against a large group of fissures of an east to west strike, which are parallel to the lodes in the adjacent West Phoenix, Phoenix United, East Phoenix and Dunsley Phoenix mines, which have been mineralised at more than one stage and consequently carry a wide mineral assemblage: quartz, gilbertite, chlorite, fluorite and occasionally apatite and bertrandite, whilst autunite (hydrated phosphates of calcium and uranium) together with andulusite and silimanite have been recorded in hornfelsed zenoliths of slate.

The granite is crossed by a series of east to west faults which heave the contact with the Killas in a more marked manner then elsewhere in the west of England. In many cases the faults are occupied by lodes, Fig. 2 shows the setts of the Caradon/Phoenix area, the lodes worked by the time the mines closed and the positions of the more important shafts.

The zonal distribution of lodes in the Caradon and Phoenix area, appears to bear out the theory of an emanative centre or deep seated magma in the Cheesewring area; tin together with sporadic wolfram occurrences being found in the Phoenix setts, copper at Marke Valley and the Caradons, with lead and silver together with fluorite, calcite etc., being in situ in the north-south fissures farther out in Butterdon, Ludcott and Wrey, and Menheniot. The wide mineral diversification in the Phoenix area, suggests that the movement of mineralising solutions was probably intermittent, associated with repeated fracturing processes at the major crosscourse and its attendant faulting.

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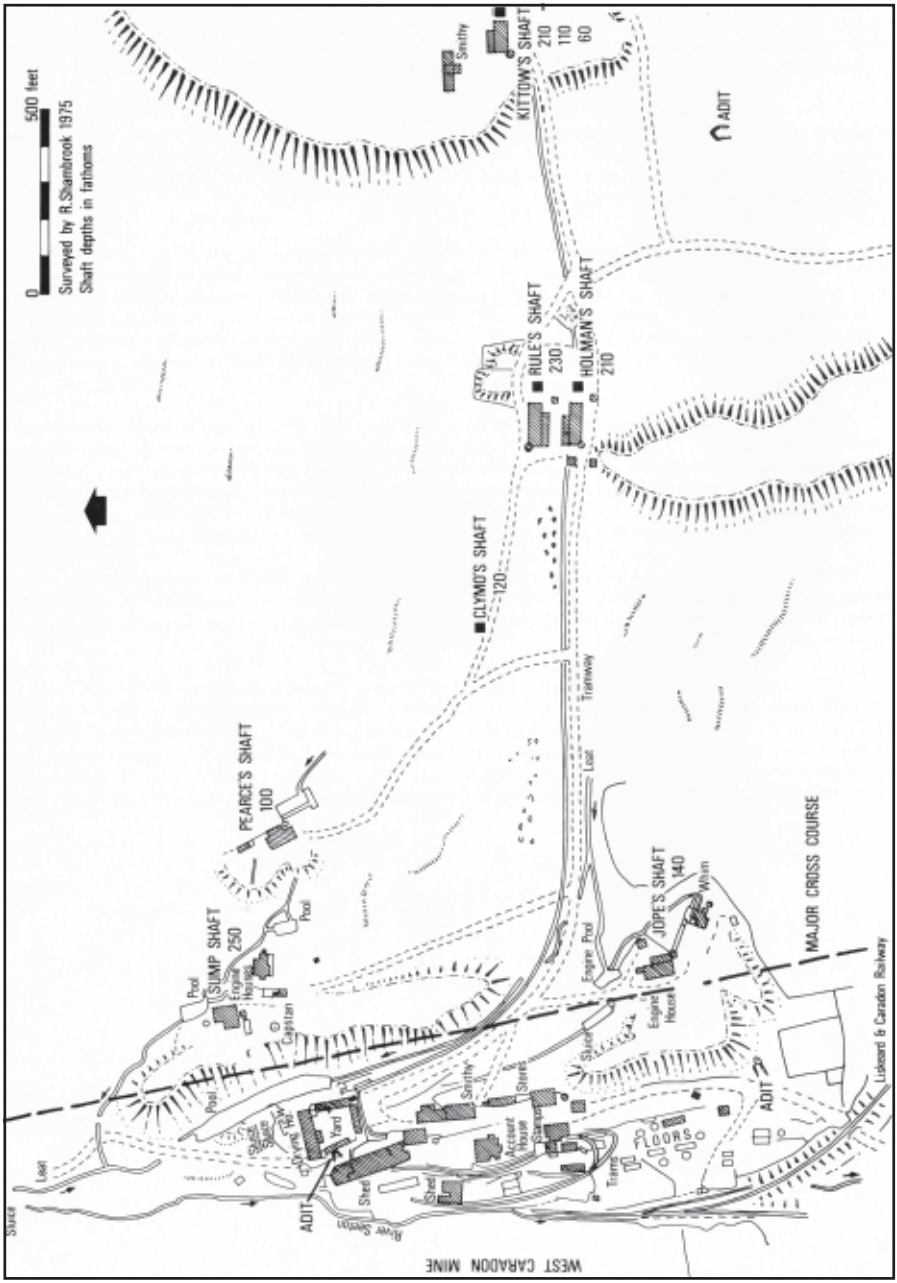

Figure 3 - South Caradon: Plan of surface features.

CHAPTER 2

THE SOUTH CARADON MINE

The development of the Caradon area mining field was due to the extraordinary success of the South Caradon Mine, which at the height of its prosperity gave direct and indirect employment to over 1000 people in an area which included not only the local villages of St Cleer, Pensilva, Darite, Tremarcoombe and Crows Nest, but also in Liskeard and Launceston. The history of this mine will therefore be presented first and later notes will describe other mines in the area, the existence of many of which depended on the investors hoping for a bonanza like South Caradon.

Background

South Caradon had an obscure and rather insignificant beginning, the original discovery was thought to be on what was to become the main lode of the original mine. In 1833 James Clymo formed a cost book company with an issued and paid up share capital of 512 shares of £1/5/0 each. The Company was subject to the Stanneries Act and the document governing its constitution and internal management - the Deed of Settlement - was similar to the modern Memorandum and Articles of Association. Not until 1883 was a Limited Liability Company formed, primarily to raise additional capital to exploit new lodes in the eastern part of the sett.

In the early years, 1833-1846, much of the production came from the lode first discovered, the earliest recorded production being 130 tons (10% metal) in 1837. Development work was carried out in the most economical fashion by driving along crosscourses and sinking winzes and shafts down the inclined lodes. The lodes opened up, from north to south, were Gilpin's, Dunstan's, Vivian's (with north and south branches), Main, Pearson's, Jope's, Clymo's, Kitford's (which also had a south branch), Caunter, Holman's and Kittow's. The prevailing trend was for lodes to underlie in a northerly direction, but the Caunter lode was so named because it underlies south. One of the longest development drives extended 150 fathoms S 10^{o}E to below Stanton farm, more than 1/3 the distance to the future Caradon Copper mine which appears to be the southerly limit of mineralisation.

The lodes varied in width from 2'-12' and contained numerous vughs filled with well formed crystals of quartz and fluorspar. The copper was present in many varieties as well formed crystals and in the massive form, including cuprite (Cu_2O), tenorite (CuO), malachite $Cu_3CO_3(OH)_2$, azurite $Cu_3(CO_3)_2(OH)_2$, chalcocite Cu_2S. and the more complex minerals with chalcopyrite $CuFeS_2$, tennantite (Cu Fe)$12As_4S_{13}$, bornite) Cu_5FeS_4 as well as silicates of copper.

Fig. 3 shows a plan of the surface features, primarily the shafts and the principal mine buildings, and the branch of the Liskeard and Caradon railway. The original discovery of copper was made along the adit whose main entrance was on the dressing floor near the drying house, it can now be entered via a collapse in the yard around

which stood the drying house, changing and wash houses, barber's shop and tool shop. Traces of these buildings remain, and the lower part of the stack for the boiler supplying hot water still stands (Plate II). The stack for the boilers providing steam to drive the crusher and stamps remains in an excellent state of preservation adjacent to the main store house, the site of the crusher is marked by a very large tip of 'deads'.

Other remains, some of them shown in Plates II-V are still very clear. Holman's (or New Engine) and Rule's shafts were filled in in recent years, but the two engine houses are very conspicuous on the hillside. While that at Holman's shaft remains in a fair state of preservation, Rule's engine house is now much dilapidated with only the lower courses of the boiler house walls and boiler foundations remaining. The track of the tramway, 3/4m in length, over which 200,000 tons of copper were transported, is still easily traceable from its easterly terminus at Kittow's shaft, round the shoulder of Caradon Hill, past Rule's and Holman's shafts where it tunnels through the extensive tips, dropping past Clymo's shaft to the dressing floors in the Seat on Valley below Jope's shaft.

The more important pumping engines included a 35" engine at Old Sump shaft (Plate VII), a 50" at Kittow's shaft and a 60" at Rule's shaft. The latter, bought from the South Garras lead mine near Truro for £1045 was installed in 1862 enabling the shaft to be deepened to 210 fathoms permitting exploration and development to commence in the eastern part of the sett, laying the foundation of the most prosperous period of the mine history (1862-1869). Jope's shaft (Front cover and Plate III), (named after John Jopes, rector of St Cleer's who died in 1844 aged 92) was pumped by a 50" engine erected by James Sims to replace a 42" engine and was the site of the last man-engine built anywhere in Cornwall, by William West both erected in the 1860s. The engine house at Jope's which was enlarged to take these additions, is in a good state of preservation and the pit of the balance bob is still traceable. The man engine was moved to Kittow's shaft on the eastern section of the South Caradon mine in 1872.

The easterly exploration from Rule's shaft led to the discovery of Kittow's North lode and the later sinking of Kittow's shaft proved most providential for the company since the Caunter lode was discovered which proved to be one of the richest and most continuous courses of copper ore found in the West Country. Caunter lode and Kittow's North lode were the two master lodes of South Caradon; both were extensively worked and through their unabated richness for many years contributed the major share of the mine's profits.

Much importance was attached to Caunter Lode, as the lode was opened out and developed both from Rule's Shaft, just north of Holman's Shaft where it was sunk on the 20° S underlie (i.e. 20° from vertical) to the 180 fathom level, as well as from the southwards incline of Kittow's Shaft which reaches the 210 fathom level where,