

Cornish mining

A brief history

The history of mining in Cornwall can be broadly sub-divided into two periods: those of streaming and underground mining. Streaming involved extracting the tin ore held in suspension in the stream water running off the granite uplands and/or digging out the ore-rich silt deposited in those streams over the centuries. Underground mining involved locating the mineral lodes and following them underground, taking out the rock in which the ore was embedded and extracting the ore from the rock. These two technologies of extracting minerals are not however as mutually exclusive as they might appear. In the streaming period underground techniques were employed, for short tunnels were driven into valley sides, while streaming continued alongside deep mining into the second half of the twentieth century. Nonetheless, the distinction remains a useful one, differentiating a period before 1600 when the majority of metal (tin) was obtained from streaming, from a period after 1700 when the majority of ore (including a variety of metals) was won by sinking shafts underground.

Shallow shaft mining was already in evidence by Richard Carew's time in the 1590s, when primitive water pumps and adits (drainage tunnels using the power of gravity to drain water into river valleys or the sea) kept the mines dry enough to work. At this period tin provided the bulk of mineral production, providing not only work and money for thousands of Cornish people but an important proportion of royal income. The earls of Cornwall in the 1100s owned the rights to coinage, a tax on smelted tin, and this went to the Duchy after its creation in 1337. Tin mining was governed by the institutions of the Stannaries, whose courts provided law for the mining community and were recognised by the Crown which guaranteed their freedom in return for a steady flow of taxes. Obtaining their first charter in 1201, the Stannaries no doubt reflected older customary rights and privileges. There were four Stannaries in Cornwall (and another four in Devon) based on Bodmin Moor, Hensbarrow, the area north of Truro and Kerrier and Penwith in the west. After a short period of dispute with the Tudor crown and Henry VII including a major rising in 1497 the Stannaries were granted a Charter of Pardon in 1508. This restored their rights and moreover gave them the power to veto certain Westminster legislation inimical to the interests of tanners. A Stannary parliament, or Convocation, was summoned and met infrequently down to 1752. The Crown's interest in mining led to an enduring royalist tradition in Cornwall.

After the Restoration in 1660 tin production boomed. This was partly because of growing demand for the metal as living standards (and the consumption of pewter goods) gradually grew, partly because of the invention of gunpowder and more efficient water powered pumping engines, and partly because of the stimulus given to adventurers (investors) when Stannary control was loosened temporarily during the Republican period. Production doubled between 1660 and the early eighteenth century, mainly through the multiplication of small underground mining operations. However, big enterprises were not unknown and mines such as Poldice in Gwennap parish were among the biggest industrial operations of the British economy in 1700.

Tin had been the major metal taken out of Cornish ground since early times. Although silver was mined at the Beer Ferris mines just across the Tamar around 1300 and there was a short but unsuccessful attempt to mine copper after the 1580s. In the early eighteenth century the monopoly of tin was broken as brass manufacturers in Bristol and the Midlands increased their demand for copper. Copper began to be mined in the early eighteenth century and by 1750 was equal in value to tin. For the next century copper was the most important mineral extracted in

Cornwall. It was the dynamism surrounding the rapid expansion of copper mining that triggered the development of a precocious industrial society west of Truro, a cockpit of inventiveness dominated by metal mining.

By the 1780s it had spawned an early industrial society, with new villages and towns, early banking ventures, independent labouring communities and a group of newly self-made merchants and gentry who owed their wealth to copper. It had also directly produced one icon of the Cornish landscape – the engine houses with their steam engines pumping water, drawing up ore and crushing the ore – and indirectly produced the other – the small chapels dotted across the landscape. Cornish mining communities proved particularly attracted to John Wesley's message and chapels began to be built from the 1760s to be added to the engine houses that had appeared from the 1730s. The period 1815-40 saw the glory days of this Cornish mining region. Its engineers led efficiency improvements made to the high pressure steam engine; its skilled workers began to find themselves in demand from mining ventures in far-flung overseas mining frontiers; its Methodist communities were eagerly praised by visitors for their orderliness, sobriety and intelligence.

During the early decades of the nineteenth century mining also expanded territorially, making its influence felt across the length and breadth of Cornwall as new mining districts were opened up first around St Blazey and Tywardreath and then further east on the slopes of Caradon Hill. At Menheniot near Liskeard new lead deposits were exploited from the 1840s, and the next three decades saw the rise (and for most the fall) of the production of metals other than copper and tin – silver and lead, zinc, iron, manganese and arsenic were the most important.

Production in terms of the real value of the ore raised in Cornish mines peaked in 1857 and 1859. At the time of the 1861 Census almost a third of the Cornish workforce was employed directly in the mines and a good proportion of the remainder were dependent indirectly on the fortunes of mining. However, after 1862 the value of production began to fall away. In 1866 the price of copper plummeted and within just two decades the production of copper ore had virtually ceased. Tin mining enjoyed a brief boom on the back of high prices in 1870/71 but then the prices of tin and lead also began to slip downwards.

The pattern of Cornish mining from 1871 to 1998 became one in which a broadly downward trend of employment and quantity of mines (with a less marked fall in output and real income) was punctuated by periodic sharp crises between which slow and hesitant recoveries took place. Within this pattern mining became concentrated in terms of both geography and enterprise. The parishes of Illogan and Camborne supplied 22% of the value of output in 1859. But by 1913 they were supplying 68%. Production was by the 1900s dominated by a small number of highly capitalised tin mines in the Central Mining District between Camborne and Redruth. Income from mining was actually higher in that district than it had been in the 1860s. But mining districts elsewhere suffered a steady attrition as each crisis brought its inevitable fresh crop of mines closures.

Major crises in 1873/74, 1883 and 1889 were succeeded by the worst of the nineteenth century in 1893-96 when thousands of miners left for the gold fields of South Africa. Production thereafter recovered to the levels of the mid-1870s only to be cut short again by the 1914-18 war, which starved Cornish mines of investment. A major depression in 1921 brought mining to the verge of extinction but the industry staggered to its feet again and survived the global depression of the 1930s.

By the 1950s, however, there were just two major working mines left – South Crofty, encompassing several of the giants of the nineteenth industry in the Central Mining District – and Geevor, by now also working the sett of the old Levant mine at St Just in Penwith. As commodity prices rose in the 1960s towards the end of the long post-war boom the survival of these mines seemed assured and new ones were again brought into production – Pendarves at Camborne, Mount Wellington and Wheal Jane at Kea and Wheal Concord near Blackwater. But 1985 saw yet another traumatic fall in world metal prices. By 1991 all the Cornish mines had closed apart from South Crofty and even that mine succumbed in 1998. Nevertheless, booming ore prices as global reserves fail to meet an exponentially rising demand from newly industrialising economies such as China make it more likely that Crofty will resume production, thus enabling Cornish mining to continue into its fourth millennium.

Issues/themes/narratives

- Narrative of rise and fall
- Narrative of independent, individualistic tinner
- Narrative of inventive, dynamic engineers

- How far did tinning suffuse wider society in the medieval period?
- What was the detailed micro-history of mining in the 19th century?
- What were the socio-cultural effects of mining?
- How did transnational links manifest themselves?
- How did mining affect demographic events and family formation in the 18th/19th centuries
- What was the history of the mining revolution of the 18th century?

Introductory Bibliography

Overviews

Barton, D.B. (1968) *A History of Copper Mining in Cornwall and Devon*, D.Bradford Barton, Truro.

Short account of the rise and fall of copper mining in Cornwall.

Buckley, Allen (2002) *the Cornish Mining Industry: A brief history*, Tor Mark, Redruth.

The best brief introduction to the history of Cornish mining since its origins in the medieval period.

Buckley, Allen (2005) *The Story of Mining in Cornwall: A World of Payable Ground*, Cornwall Editions, Fowey.

Overview of Cornish mining from the ancient tin industry to the closure of Crofty. Concentrates on the technical side of things rather than the social history.

Dines, H.G. (1956) *The Metalliferous Mining Region of South West England, two volumes*, HMSO, London.

The bible of the serious mining historian. Provides the geological background, an account of the differing minerals found in Cornwall and Devon and voluminous details of mines, with a series of maps.

Financial/economic history

Burke, Gillian and Richardson, Peter (1981) 'The decline and fall of the cost book system in the Cornish tin mining industry, 1895-1914', *Business History* 23, 4-18.

Discusses the effect of the crisis of the 1890s on the organisation of Cornish mining.

Burt, Roger (1991) 'The international diffusion of technology in the early modern period: the case of the British non-ferrous mining industry', *Economic History Review* 44, 249-71.

Explains the expansion of tin and lead mining between the 1500s and early 1700s by the multiplication of small units of production. Production rose as a result of the application of more intensity by independent part time miners/farmers rather than by major proletarianization or by technological change.

Burt, Roger (1995) 'The transformation of the non-ferrous metals industries in the seventeenth and eighteenth centuries', *Economic History Review* 48, 23-45.

The growth of metal mining in the eighteenth century is explained by political factors such as a positive climate for enterprise in Britain and an isolation from political upheavals after the 1640s. Describes the change from traditional independent part-time 'owner-occupier' operations to externally funded, professionally managed enterprises with full-time labour.

Burt, Roger (1998) 'Proto-industrialisation and "stages of growth" in the metal mining industries', *Journal of European Economic History* 27, 85-104.

Applies the proto-industrialisation model to the early modern metal mining industry

Burt, Roger (1998) 'History of metalliferous mining' in G.B.Selwood, E.M.Durrance and C.M.Bristow (eds), *The Geology of Cornwall*, University of Exeter Press, Exeter, 211-25.

Useful overview of the economic history of Cornish mining.

Burt, Roger (1998) 'Segmented capital markets and patterns of investment in late Victorian Britain: evidence for the non-ferrous mining industry' *Economic History Review* 51, 709-33.

Investigates the structure of the capital market for non-ferrous mining in the second half of the 19th century. Concludes that growing overseas investment did not 'crowd out' investment in domestic mining.

Burt, Roger and Kuro, Norikazu (1983) 'The adaptability of the Cornish cost book system', *Business History* 25, 30-41.

Reappraisal of the cost book system which the authors conclude was an adaptable system before the 1890s.

Burt, Roger and Timbrell, Martin (1987) 'Diversification as a response to decline in the mining industry: arsenic and south-western metal production', *Journal of Interdisciplinary Economics* 2, 31-54.

Concludes that arsenic production was not a major factor in the maintenance of tin and copper production and that the 'casual empiricism of industrial historians' has overestimated its impact in the later 19th century.

Burt, Roger; Waite, Peter; Burnley, Ray (1987) *Cornish Mines*, University of Exeter, Exeter.

Detailed production figures at mine level from the 1840s to 1913

Lewis, Jim (2006) 'Cornish Copper Mining 1795-1830; Economy, Structure and Change' in Philip Payton (ed.) *Cornish Studies Fourteen*, University of Exeter Press, Exeter, 164-86.

Charts the economic history of copper mining in these years and the role of Cornish merchants and London investors in its stabilisation in the later Napoleonic period.

Social history of mining and miners

Buckley, Allen (2007) *Princes of the Working Valley: the day and night book of two Dolcoath mine captains 1822-23*, Truran, Truro.

Revealing study of the everyday working life of two mine captains at Dolcoath.

Burke, Gill (1981) 'The Cornish Miner and Cornish Mining Industry 1870-1921', unpublished PhD thesis, University of London.

Comprehensive account of the economic and social history of Cornwall's mining communities in their twilight days from the tin boom of 1870 to the crash of 1921. (Hard copy at the Cornwall Centre.)

Burke, Gill (1984) 'The Cornish diaspora of the nineteenth century' in Shula Marks and Peter Richardson (eds), *Internal Labour Migration: Historical perspectives*, Temple Smith, London, 57-75.

Explanation of the emigration of Cornish miners from a marxist and global perspective.

Burke, Gill (1986) 'The decline of the independent bal maiden: the impact of change in the Cornish mining industry' in Angela John (ed.), *Unequal Opportunities: Women's Employment in England 1800-1918*, Blackwell, Oxford, 179-204.

Discusses the decline in the female workforce at Cornish mines and explains this in terms of technological and cultural changes.

Deacon, Bernard (2001) 'The reformulation of territorial identity: Cornwall in the late eighteenth and nineteenth centuries', unpublished PhD thesis, Open University

Argues that Cornwall's industrialisation based around its mining industry transformed the Cornish identity and analyses the basis of this identity.

Deacon, Bernard (1982) 'Attempts at unionism by Cornish metal miners in 1866', *Cornish Studies* 10, 27-36.

Describes the industrial unrest in east Cornwall in 1866, the first (and unsuccessful) attempt to form a mining trade union in Cornwall.

Deacon, Bernard (1986) 'Heroic individualists? The Cornish miners and the five-week month 1872-74', *Cornish Studies* 14, 39-52.

Challenges the view that the Cornish miner was an incorrigible individualist through an account of the wave of strikes in 1872-74 in Cornwall.

Deacon, Bernard (1986-87) 'Migration and the mining industry in east Cornwall in the mid-nineteenth century', *Journal of the Royal Institution of Cornwall* 10, 84-104.

Delineates the migration from west to east Cornwall that accompanied the eastwards expansion of mining.

Deacon, Bernard (2007) "We don't travel much, only to South Africa". Reconstructing nineteenth century migration patterns' in Philip Payton (ed.), *Cornish Studies Fifteen*, University of Exeter Press, Exeter, 90-116.

A reconstruction of the migration patterns of the Cornish in the nineteenth century, integrating emigration and migration within the UK.

Hamilton Jenkin, A.K. (1927), *The Cornish Miner: an account of his life above and underground from early times*, George Allan and Unwin, London.

Classic social history of Cornwall's mining communities. Romanticised in places but still valuable for the flavour of life in a rural mining region in the early nineteenth century.

Henwood, George (1972) *Cornwall's Mines and Miners*, D.Bradford Barton, Truro, 1972

Edited by mining historian, Roger Burt, this brings together the pen portraits of mining written by mining journalist George Henwood and published in the *Mining Journal*, 1857-59. An invaluable account of Cornish mining communities and their culture at the height of Cornish mining.

Mayers, Lynne (2004) *Balmaidens*, Hypatia Trust, Penzance.

Comprehensive discussion of women's role in the nineteenth century mining industry.

Norwood, Stephanie (1991) 'Bal maidens: a study of Victorian female workers in the West Country', unpublished B.Ed dissertation, Wolverhampton Polytechnic.

Concentrates on the images and stereotypes of bal maidens produced by contemporaries and twentieth century historians alike.

Payton, Philip (1984) *The Cornish Miner in Australia: Cousin Jack down under*, Dyllansow Truran, Redruth.

Payton, Philip (1999) *The Cornish Overseas*, Cornwall Editions, Fowey.

The best overview of Cornwall's 'great emigration' a flow of people largely structured by the booms and slumps of the mining industry.

Payton, Philip (2007) *Making Moonta: The Invention of Australia's Little Cornwall*, University of Exeter Press, Exeter.

The entertaining story of Australia's Little Cornwall, the 'largest Cornish communities beyond Land's End' owing their existence to copper mining. Details the rise and fall of the community, its working class heroes, its women and its Methodists and explains the durability of the Moonta myth.

Rose, Damaris (1987) 'Home ownership, subsistence and historical change: The mining district of west Cornwall in the late nineteenth century' in Nigel Thrift and Peter Williams (eds), *Class and Space: The Making of an Urban Society*, London, 108-53.

An important contribution that assesses the role of homeownership and smallholdings in defining the mining working class, the strategies it employed to respond to de-industrialisation and its political outlook.

Rowe, John (1974) *The Hard Rock Men: Cornish Immigrants and the North American Mining Frontier*, Liverpool University Press, Liverpool.

Rule, John (1971) 'The labouring miner in Cornwall c1740-1870', unpublished PhD tehsis, University of Warwick.

Indispensable social history of the mining communities of Cornwall in their heyday. (Hard copy at the Cornwall Centre)

Rule, John (1970) 'The tribute system and the weakness of trade unionism in the Cornish mines', *Bulletin of the Society for the Study of Labour History* 21, 24-29.

Begins to point to other factors in the absence of trade unions in nineteenth century Cornwall in addition to the payment system.

Rule, John (1971) 'Methodism and Chartism among the Cornish miners', *Bulletin of the Society for the Study of Labour History* 22, 8-11.

Identifies Methodism as the 'essential element in the configuration of quietism'

Rule, John (1992) 'A "Configuration of quietism"? Attitudes towards trade unionism and Chartism among the Cornish miners', *Tijdschrift voor Sociale Geschiedenis* 2/3, 248-62.

Proposes that the relative slowness of Cornish miners to unionise and their lack of support for Chartism can be best explained by combining a number of factors rather than focusing on a single-cause explanation.

Rule, John (2006) *Cornish Cases*, Clio Publications, Southampton.

Brings together John Rule's work on the social history of mining communities with newly published material on food riots and feast days.

Salmon, H.C. (2000) *Mines of the Sixties*, Griffin Publications, Ludlow.

Extracts from the contributions of Salmon to the *Mining Journal* in the 1860s collated by G.W.Hall. Complements Henwood's *Cornwall's Mines and Miners*.

Todd, A.C. (1977) *The Search for Silver: Cornish Miners in Mexico, 1824-1947*, Lodenek Press, Padstow.

District and mine studies

Barton, D.B. (1963) *A Guide to the Mines of West Cornwall*, D.Bradford Barton, Truro.

Short introductory guide to the principal mines west of Truro and Newquay.

Barton, D.B. (1964) *A Historical Survey of the Mines and Mineral Railways of East Cornwall and West Devon*, D.Bradford Barton, Truro, 1964

Very readable guide to the history of the mining districts to the east of Truro.

Hamilton Jenkin, A.K. (1978) *Wendron Tin*, Wendron Forge, Helston.

Illustrated historical account of the mines of Wendron, with detailed maps.

Hamilton Jenkin, A.K. (1961-70) *Mines and Miners of Cornwall 16 volumes*, Truro Bookshop, Truro (vols 1-14) and Federation of Old Cornwall Societies (vols 15-16).

Hamilton Jenkin's classic series of publications on the mines of Cornwall. These focus on the smaller and less well known mines rather than the more famous names. Best consulted in tandem with Hamilton Jenkin's annotated six inch OS maps, available on microfilm at the Cornwall Centre, Redruth.

Lewis, Jim (1997) *A Richly Yielding Piece of Ground: The Story of Fowey Consols Mine near St Blazey*, Cornish Hillside Publications, St Austell.

Detailed account of the history of mid-Cornwall's premier copper mine – active from 1813 to 1867.

Trounson, Jack (1993) *Cornwall's Future Mines: Areas in Cornwall of Mineral Potential*, University of Exeter Press, Exeter.

A series of mine reports on districts in Cornwall with prospects for future development, written by a tireless publicist of Cornish mining.

Wilkinson, W.F. (1895) *History of the Holmbush, Rednmoor and Kelly Bray Mines*, Mining Journal, London.

Account of these Callington mines.

Technological histories

Nuvolari, Alessandro (2004) 'Collective invention during the British industrial revolution: the case of the Cornish pumping engine', *Cambridge Journal of Economics* 28, 347-63.

Argues that the Cornish mining region was a collective invention setting where shared knowledge was a crucial source of innovation in the early 19th century. Explains why this emerged in Cornwall and analyses its consequences for technological innovation.

Von Tunzelmann, G.N. (1970) 'Technological diffusion during the Industrial Revolution: the case of the Cornish pumping engine' in R.M.Hartwell (ed.), *The Industrial Revolution*, Basil Blackwell, Oxford,

Examines the reliability of the data in Lean's *Engine reporter* and concludes these were robust enough to support the conclusion that the duty achieved by engines improved rapidly after 1815 and that high-duty engines emerged especially rapidly after 1825-26.

Von Tunzelmann, G.N. (1978) *Steam Power and British Industrialisation to 1860*, Clarendon Press, Oxford, 252-64.

Discovers that improvements in the stationary high-pressure steam engine within Cornwall were more rapid at times of depressed metal prices. Supports the interpretation of the Cornish engine as 'the highest level of technological accomplishment in its field' between 1815 and 1840. This was made possible by the 'disembodied' character of the developments, needing little in extra capital investment.

Contemporary surveys

Abbott, George (1833) *An Essay on the Mines of England*, np, London.

Account of the working of Cornish mines and statement of the condition of the mining industry.

Borlase, William (1758) *The Natural History of Cornwall*, Oxford

Burt, Roger (ed.) (1969) *Cornish Mining: Essays on the Organisation of Cornish Mines and the Cornish Mining Economy*, David and Charles, Newton Abbot,

Contains essays on the economic organisation of nineteenth century mining written by contemporaries, including John Taylor, Charles Lemon, Joseph Carne, James Sims and Langford Lovell Price, with special emphasis on the employment system.

Carew, Richard (1811) *Survey of Cornwall*, J.Fauldner, London (originally published 1602)

Describes techniques of Cornish mining at the end of the sixteenth century. The 1811 edition contains useful comparative notes written by Thomas Tonkin in the eighteenth century.

Collins, J.H. (1912) *Observations on the West of England Mining Region* (reprinted by Cornish Mining Classics, Truro, 1988)

Descriptions of Cornish mining, account of the geology of the mining districts and a list of mines with various details.

Henwood, William (1843) *The Metalliferous Deposits of Cornwall and Devon*, J.Pope Vibert, Penzance.

Making up volume 5 of the *Transactions of the Royal Geological Society of Cornwall* this is a comprehensive underground survey of the mines of Cornwall and Devon and their geological context.

Leifchild, J.R. (1857) *Cornwall: Its Mines and Miners*, Longman, Brown, Green, Longman and Roberts, London.

Account of Cornish mining which ranges widely over aspects such as geology, labour system and social conditions of mining as well as its organisation and technology.

Pryce, William (1778) *Mineralogia Cornubiensis; a Treatise on Minerals, Mines and Mining*, London.

Taylor, John (ed.) (1829) *Records of Mining*, John Murray, London.

Detailed account of early nineteenth century metal mining. Particularly useful for information on steam pumps and illustrations of mining technology.

Thomas, Charles (1871) *Mining Fields of the West*, np, St Austell (reprinted by Bradford Barton, 1967)

Description of mines in the 1860s, written by Dolcoath's mine manager.

Tredinnick, R. (1857) *A Review of Cornish and Devon mining enterprise*, Thompson and Vincent, St Helens.

Review of Cornish mines at their peak by a London mines share broker.

Trounson, John (1986) *The Cornish Mineral Industry: Past Performance and Future Prospect- A Personal View 1937-1951*, University of Exeter, Exeter.

Compilation of surveys of mid-twentieth century mining and its prospects for the future by Jack Trounson, the 'grand old man of Cornish mining'.

Watson, Joseph (1843) *A Compendium of British Mining*, np, London.

Contains descriptions of Cornish mining districts.

Other

Barton, D.B. (1968) *Essays in Cornish Mining History Volume 1*, D.Bradford Barton, Truro.

First volume of Denys Bradford Barton's essays, covering technical aspects such as water engines and smelting together with essays on the image of the Cornish miner, emigration to Australia, mine names and an account of New Trumpet and Lovell Utd in Wendron.

Barton, D.B. (1970) *Essays in Cornish Mining History Volume 2*, D.Bradford Barton, Truro.

Second volume of Barton's collected essays ranging through the history of smelting, arsenic production, Portreath and Restronguet Creek Tin Works amongst other subjects.