

**CREATING THE CULT OF “COUSIN JACK”: CORNISH MINERS IN LATIN
AMERICA 1812-1848 AND THE DEVELOPMENT OF AN INTERNATIONAL
MINING LABOUR MARKET**

British involvement in the nineteenth century development of Latin American mining resources has in recent years received the attention of historians such as Robert Randall, John Mayo and Marshall Eakin (Randall, *Real del Monte*; Mayo, *British Merchants*; Eakin, *British Enterprise*). The role of the Cornish in the British development of Latin America's metalliferous mining industries has been hinted at in mining literature, but insufficiently explored. Situated at the extreme south west of Britain, Cornwall is a narrow peninsula surrounded on three sides by the Atlantic Ocean and bounded from neighbouring Devon by the River Tamar in the east. It covers an area no more than 1,365 square miles and at no time during the first half of the nineteenth century could boast a population greater than 375,000. Yet its size is disproportionate to the influence the Cornish people have exerted upon the world in the field of metalliferous mining and engineering.

Recent scholarship has focused attention on Cornwall's leading role in the industrial revolution by virtue of shifts in spatial focus exploring combined and uneven regional patterns of industrialisation in Britain (Hudson, *Industrial Revolution*, Richards, *Margins*). Such a shift has directed attention to Cornish miners and their industry by practitioners from a variety of disciplines, resulting in an eclectic approach. This has enhanced our understanding of the process of industrialisation in Cornwall and of its leading role within the British Isles in the field of metal mining and engineering. But it

is perhaps timely to investigate the role of regional contributions to the overseas expansion of British industrial prowess. This essay will therefore concentrate on the pioneering exportation of metalliferous mining skills and steam technology to Latin America by Cornish miners, or “Cousin Jacks”, as they were colloquially known.¹ In doing so it will discuss how Cornish miners established a cult following in the nineteenth century, one that was hard-won in the mines of South and Central America. By the late 1800s Cousin Jack was considered to be the hard-rock miner par excellence, considered virtually insuperable in non-ferrous, but also ferrous mining. The reputation of being the best hard-rock miners in the world enabled them to migrate to mining regions throughout the world. Finally, it will contend that Latin America, as an early recipient of British capital and industrial technology, was the birthplace of the modern integrated global mining economy with its attendant capital and labour markets. As capital migration was more diffuse than labour migration (the movement of capital can be understood at a different spatial level from the movement of labour), the migration of labour, skills and technology require a more focused scale of analysis. This paper will therefore show that in the expanding international mining market, Cornish miners, “the light infantry of capital” (Burke 65) and flag-bearers of empire were in the vanguard.

Cornwall: engine-house of the Industrial Revolution

Mining in Latin America has a long and illustrious history, primarily in silver production, but also in gold, mercury and copper. Centuries of mining had brought the industry in Latin America to levels of sophistication comparable to many mining centres in Europe, enriching Habsburg Spain in the process. Yet by the early nineteenth century the once

great mines of the Spanish Empire were in decline, struggling with financial difficulties, engineering problems and labour shortages, in areas ravaged by war.

Cornish mines, in contrast, were booming. By the late eighteenth century Cornwall had emerged as a centre of technological innovation in deep lode mining and engineering. Sidney Pollard has identified Cornwall as one of Britain's earliest industrial regions with a distinct and specialised extra-regional commodity export - copper ore (14). This, together with tin and some lead, provided the main output of Cornwall's mining industry. Roger Burt, describing the marshalling of large quantities of fixed capital, the rise of semi-joint stock forms of organisation with a brisk informal share market and the organisation of a hierarchically structured labour force, has emphasised the pioneering and dynamic role played by non-ferrous metal mining in eighteenth century industrialisation in regions such as Cornwall (42).

Therefore by the early 1800s, Cornwall, with its powerful capitalised industry and organised labour force, had established a clear comparative advantage in metal mining in a similar way that Lancashire had in cotton textile manufacture (Deacon 27-41). Deep lode mining was facilitated because of the advances made in the field of steam technology. These had allowed the development of the huge engines used primarily to dewater Cornwall's deepening mines, attracting many of the leading engineers, innovators and scientists of the time. Engineers such as Scottish born William Murdoch from the Soho firm of Boulton and Watt, together with Cornish born engineers, Woolf, Grose, Sims, Loam, Hornblower, Bull and most famously, Richard Trevithick, ushered in a period of creativity that commenced in the late eighteenth century, building on the foundations laid by Boulton and Watt, that lasted until the 1840s. During this time it was

found that the type of steam engine being used to drain mines in Cornwall was performing much more efficiently than contemporary physics said was theoretically possible (Griffiths, 239-242; Kanefsky and Robey 176-177). This was summed up by Thomas Lean, a contemporary leading engine reporter:

Great as are the advantages which this nation in general enjoys from the invention of the steam engine, and the successive improvements which it has received; there is, perhaps, no place in particular, where all those advantages have been greater, or more evident, than in Cornwall. The very existence of its deepest, and most productive mines, is owing, not merely to the invention of the steam engine, but to the state of great perfection to which that machine has been brought in that county (Barton 1).

At the beginning of the nineteenth century, deep lode mining with the aid of steam engines, made the Cornish mining industry arguably the most advanced in the world. Latin American mine owners, alarmed at the decline of their once mighty industry, began to consider that the introduction of British manufactured steam engines in particular might hold the answer to a revival in their fortunes.

The Peruvian Precedent: Trevithick's engines for Cerro de Pasco

One of the earliest examples of the migration of British steam technology was to work the celebrated mines of Cerro de Pasco, under the management of a Peruvian company formed in 1812 by Pedro de Abadía, a prominent Lima merchant, his partner Joseph de

Arismendi, and a Swiss gentleman, Francisco Uvillé.² This marked the genesis of the later larger scale migration backed by capital of the mid 1820s. After numerous attempts to drain the Pasco mines by socavónes (tunnels, or adits) with limited success, this new company put a proposal to dewater the mines with British-made steam engines to Viceroy Abascal in 1812. Uvillé, sent on a scouting mission to Britain in 1811, had discovered and purchased a model of a Cornish engine in London that had been manufactured by Richard Trevithick, the son of a Cornish mine manager who had invented the world's first practical steam carriage in 1801. When Uvillé set Trevithick's model engine to work at Pasco it defied critics who claimed it would not function at over 14,000 feet in the rarefied atmosphere of the Andes.

In 1813 Uvillé was instructed to travel to Cornwall to seek out Trevithick and to purchase several steam engines and employ the workmen to construct them. Trevithick enthusiastically agreed to design the engines with the necessary auxiliary equipment, and undertook to organise their construction. The level of his interest is evidenced through his investment of about \$3,000 in the Pasco Mining Company when Uvillé commenced selling shares in London to help finance the enterprise. Trevithick later sold part of these shares in order to liquidate the mounting debt incurred in buying equipment and machinery for Pasco. In 1814, fifteen months after his arrival in Britain, Uvillé sailed from Portsmouth bound for Peru with four Cornish pumping engines complete with pitwork, four winding-engines, a portable rolling-mill engine (for the Lima Mint), two crushing mills and four extra Cornish boilers that had been dispatched by Trevithick. Several Cornishmen, who were to install and maintain the machinery, also joined the voyage. This had been manufactured at the Bridgnorth Foundry, Shropshire, and what

would become one of Cornwall's foremost foundries, Holman's of Camborne, manufacturers of the first machinery to leave British shores for Latin America.

The scale of the operation, in an era that preceded modern communication and transportation systems, is truly remarkable. After a long sea voyage via Cape Horn to Lima and a tortuous twelve to eighteen month trek inland through difficult terrain over which no wheeled vehicle could travel, most of the equipment arrived at Pasco. The engines and boilers had been specially cast in sections to allow the parts to be transported more easily to the mines by mules, where they were to be assembled. In 1816 one of the cumbersome engines was successfully installed at the Santa Rosa Mine, demonstrating its potential by rapidly draining a pit below adit level (beneath the level at which water will flow from a mine naturally), astonishing a local official who described the innovation as "the most significant for the mining industry since the conquest of Peru" (Fisher 115).

The elation however, was to be short-lived as further progress was impeded by problems in component assembly. This was not totally unexpected when we consider the pioneering nature of the enterprise, involving the exportation of complicated, heavy machinery half way around the world to a region without the infrastructure of improvising engineers, foundries and workshops, taken for granted in Cornwall. The problems with the boilers in particular caused concern, as these were so vital to the successful operation of the steam engines. It transpired that the boiler tubes had to be adapted for the burning of peat instead of coal, the fuel commonly used in Britain. This necessitated the travel to Peru in 1817 of Trevithick himself with a Cornish boiler-maker. With Trevithick's arrival, the problems were eventually surmounted, aided in part by the

discovery of a seam of coal in the vicinity of the mines. By the end of 1819 three engines were at work at the mines of Santa Rosa, Caya and Yanacancha.

Figures for silver production at Cerro de Pasco (fig. 1) suggest that the application of Trevithick's steam engines had a dramatic, immediate effect on silver mining, enabling rich ores lying below adit level to be exploited for the first time (Fisher 122). Silver registration at Pasco rose by 350 per cent in 1820, an increase to the highest level since 1811, and the second highest figure ever recorded for Pasco, representing over 65 per cent of Peru's total registered silver production for 1820 (Fisher 114).

Fig. 1. Registered Silver Production for the Caja of Pasco, 1800-1824



Taken from figures given by J.R. Fisher, Silver Mines and Silver Miners in Colonial Peru, 1776-1824 (University of Liverpool, Monograph Series No. 7. 1977)

A party of Cornish lead smelters that arrived at Lima in 1819 under Richard Vivian appeared to have made a significant breakthrough in the recovery of lead, which was formerly lost in the native silver smelting process, successfully setting up a furnace at Pachachaca near Pasco. This looked destined for success until the wars of emancipation intervened (Miller 143-44; Dickinson and Titley, 185-86).

Indeed, the bright prospects offered to the Peruvian mining industry through the introduction of Cornish skill and technology were severely retarded by battles that raged in the Pasco area for at least four years and silver production dwindled to a virtual halt (see fig. 1.). During this time valuable machinery was smashed and the Cornish engineers and smelters fled to Lima. Trevithick, after a dispute with Uvillé which caused him to leave Pasco, attempted with limited success to work copper mines in Cajatambo and Chile. He ended up several years later prospecting for gold in the Isthmus of Nicaragua before returning to Cornwall penniless in 1827. (Dickinson and Titley, 185-206). It was not until the mid 1820s that attempts to work the mines at Cerro de Pasco with steam engines and imported Cornish labour resumed under the Pasco-Peruvian Company.

Trevithick's enterprise in the Andes has been described as a failure (Fenn 100), but the figures for silver production at Pasco lead us to conclude otherwise. Had it not been for the war, the promising foundations laid by the introduction of British technological skill would doubtless have been built upon. Yet this was merely a foretaste of what was to come in the 1820s, a period that witnessed a renaissance in mining in South and Central America, backed by large sums of British capital. This opened a new and exciting epoch in British-Latin American relations as "imperialism

through trade” culminated in the exportation of the industrial revolution to South and Central America and the broadening of the frontiers of Britain’s “informal empire”.

A new world order: the migration of British capital

By the 1820s the volatile political situation caused Latin American mines that had been for three centuries the principal source of precious metals, and the envy of the world, to lie derelict. The mining infrastructure had collapsed; apparatus was left to fall into decay, capital withdrawn as financiers fled to Spain fearing reprisals and the mining villages steadily depopulated. In Britain, the end of the Napoleonic Wars had witnessed deflation and depression compounded by a lack of specie. A dwindling stock of precious metals, caused primarily by the collapse of mining in the New World, created a downward spiral of prices that had worrying implications for British domestic and foreign trade (Jenks 28). However, it was widely believed that this trend could be reversed by a resumption of production in precious metals. Great Britain had long cast a coveted eye on Latin America: “the imagination can scarcely encompass the field of speculation that opens to the enterprises of British industry and the employment of British capital” (Western Luminary, 8 Mar, 1825). The newly independent Latin American countries courted Britain with the promise of trade, albeit with duties. The absence of a strong and protected market did not induce principal owners of capital in Latin America - Church and merchants - to invest in industry. It was deemed preferable to allow British manufacturers and industrialists to fill the vacuum left by Spanish decline, in developing and supplying national needs (Collier et al 223). This led to the opening up of the interior of Latin America to trade, ownership, management, and above all, investment.

The resulting investment “boom” in the early 1820s saw large-scale capital outlay in Latin American government bonds, and in joint stock companies. Of the 127 new companies added to the London Stock Exchange, 44 were mining companies; a significant fact, as practically none had existed before. Moreover, over 50 per cent of these new companies were formed to work mines in Latin America (see Table 1). This period can be said to mark the real commencement of British investments in independent and semi-independent foreign nations (Rippy 123).

In Latin America, governments acted quickly to create the prerequisite conditions for foreign intervention in the mining industry. Newly independent Mexico in 1823 rescinded those articles that had barred foreigners from the mining industry of colonial Mexico winning the praise of Lucas Alamán. He was perhaps the most prominent of a collaborating or mediating elite who were directly responsible for opening the Mexican mining industry to foreign penetration, believing the mines to be the touchstone of his country’s prosperity and the basis on which foreign trade rested (Randall 28-9, Gilmore 90). The Brazilian Government too, relaxed restrictions imposed on foreigners by its ancient laws (English 11).

Name of Company	Country of operation	Capital	
		£ Authorised	£ Paid Up
Anglo-Chilean	Chile	1,500,000	120,000
Anglo-Mexican	Mexico	1,000,000	750,000
Anglo-Columbian	Colombia	1,500,000	75,000
Anglo-Peruvian	Peru	600,000	30,000
Bolaños	Mexico	200,000	87,500
Bolívar	Venezuela*	500,000	50,000
Brazilian	Brazil	2,000,000	20,000
Castello	Brazil	1,000,000	50,000
Chilian	Chile	1,000,000	75,000
Chilan and Peruvian	Chile & Peru	1,000,000	50,000
Colombian	Colombia	1,000,000	150,000
Famatina	Argentina	250,000	50,000
Guanajuato	Mexico	400,000	6,000
General South American	Primarily Brazil	2,000,000	100,000
Haytian	Haiti	1,000,000	50,000
Imperial Brazilian	Brazil	1,000,000	200,000
Mexican	Mexico	1,000,000	150,000
Pasco-Peruvian	Peru	1,000,000	150,000
Potosí-La Paz & Peruvian	Peru & Bolivia	1,000,000	50,000
Real del Monte	Mexico	400,000	325,000
Río de la Plata	Argentina	1,000,000	75,000
Tlalpuxahua	Mexico	400,000	120,000
Tarma	Peru	200,000	5,000
United Chilian	Chile	500,000	50,000
United Mexican	Mexico	1,240,000	775,000
United Provinces	Central America*	1,500,000	15,000
TOTAL		24,190,000	3,508,500

Table 1. British Mining Companies formed to operate in Latin America in the years 1824-25.

Extracted from Henry English, A General Guide to the Companies formed for Working Foreign Mines, (London, 1825). * Venezuela was then a part of the state of Gran Colombia; the activities of the United Provinces company were focused on the Provincias Unidas del Centro América - Guatemala, Honduras, El Salvador, Nicaragua and Costa Rica.

Highly inflated prospectuses were issued by companies set up to work mines across Latin America, containing claims based more on the myths of their colonial past, than on fact or scientific grounds. Many prospectuses drew on the reports of German, Baron von Humboldt (who had travelled extensively in South and Central America and was considered something of an expert), and contained two basic points. Firstly, that the mines worked in colonial Latin America had been profitable, but were hampered by a lack of modern technology and a dearth of geological knowledge. Secondly, and more importantly, it was believed that the introduction of British capital, technology and skilled labour would be able to surmount any difficulties in developing a modern metalliferous mining industry in Latin America:

It is believed, that by the introduction of English Capital, skill, experience, and machinery, the expenses of working these Mines [of the Anglo-Mexican Mining Association] may be greatly reduced, and their produce much augmented...with the advantage of English assistance...the benefit to be derived from the investment of Capital in the performance of these Contracts promises to be very ample. (English, 5)

In search of “El Dorado”: the migration of Cornish skill

In order to fulfil such claims, the operators of the new companies looked, as the Pasco Peruvian Company had done, primarily to Cornwall. British people were familiar with

the Cornish system of mining and fully expected it to prove successful in improving existing methods in the Americas. Although miners from other parts of Britain such as Wales, Cumberland and Scotland, were recruited, as well as men from America, France, Hungary and Germany, miners from Cornwall far outnumbered them. For this small area of south west Britain played an important and previously overlooked role in the early years of British expansion in Latin American mining, featuring strongly in the direction of the mining enterprises, the recruitment and subsequent transportation of skilled labour, the manufacture of technical equipment and also in financial backing.

Cornishmen featured on the board of directors of just under a third of the Latin American mining enterprises. These men were representative of some of the most prominent and well connected mining and merchant families in Cornwall. For example, John, Michael and William Williams, sons of nouveau riche John Williams of Scorrier, Gwennap, were the owners of extensive mining properties throughout Cornwall and had acquired an unrivalled business empire that stretched from Cornwall to Northern England, Wales and Ireland. It was the patronage and financial aid of Messrs Williams that Trevithick sought for working mines in Costa Rica upon his return from the Isthmus of Nicaragua in 1827 (a scheme that came to naught). Michael Williams was associated with the Haytian, Imperial Brazilian and Pasco-Peruvian Mining Companies. His Quaker brother John, was connected with the Chilean and the Río de la Plata Mining Associations and William with the Chilean Mining Association.

The only family with business interests to rival the Williams' were their friends and co-partners, the Quaker Fox family of Falmouth, prominent merchants, industrialists and shipping agents. George C. and Alfred Fox were directors of the Chilean Mining

Association, Alfred becoming the Brazilian Vice Consul for the Cornish district stretching from the Scilly Isles to Fowey in 1827. Truro man, T.F. Hornblower, of the United Chilean Mining Association, came from a long and illustrious line of engineers and just over the River Tamar in Tavistock, South Devon was John Gill, of the Chilean and Peruvian Mining Association. Further afield was London-based C. Pascoe Grenfell, of the Colombian and Brazilian Mining Associations; a former naval officer of Cornish descent, Grenfell had lost an arm fighting with the Latin Americans in the wars of emancipation. To this list must be added the name of John Taylor, a native of Norwich, England, who was involved with the Bolaños and Real del Monte mining companies in Mexico. Although not of Cornish extraction, he had achieved great respect and recognition through his profitable dealings in mines in both Devon and Cornwall. His association with the mighty Consolidated Mines of Gwennap, where he turned a failing copper mine into a bonanza, and with other prolific producers, made his name synonymous with Cornish mining.

These men were connected with many of the leading Cornish mine captains, engineers and surveyors of their day. Individuals known to men like John Taylor or the Williams' through links forged at local mines, or through kinship, were offered jobs in Latin America, the genesis of the much discussed global "Cousin Jack network" (Payton *Overseas* 14-42). John Rule, a native of Camborne and superintendent at the United Mines of Gwennap, then managed by Taylor, was hand-picked by him to be the mine manager at Real del Monte. Rule, in turn, recruited the most skilled and reliable miners and artisans known to him. Moreover, from 1824 a spate of notices appeared in Cornish

newspapers offering interviews to men who produced suitable testimonials for jobs in the Americas, heralding the arrival of a modern style of labour market.

Although the main focus of these companies was centred on London, where the head offices were situated and annual general meetings held, at their inception most of the logistical arrangements were conducted in Cornwall. Here the great foundries such as Sandy's, Carne and Vivian, and Harvey's, both of Hayle, Holman's of Camborne, and the Perran Company Foundry of Fox-Williams manufactured the Cornish steam engines, boilers, pumps and stamps (ore crushing machinery) for Latin American mines. Smaller manufactories made everything from theodolites and ropes, to miners' dags (picks), shovels, bucking irons (flat faced hammers for grinding ore), copper riddles (sieves) and kibbles (iron buckets). Charles Lambert, who was to become one of the most influential Anglo-Chileans of the nineteenth century, made two visits to Cornwall, in 1816 and 1825, on both occasions visiting the Williams' at Scorrier. As the general manager of the Chilean Mining Association, Lambert sailed for Chile from Falmouth, Cornwall, in March 1825 per the Eclipse, having with him a company of Cornish miners and mining equipment (Mayo and Collier 29-31).

Although some men and machinery were dispatched from Swansea, Portsmouth, Plymouth and Liverpool, by far the most was exported through the port of Falmouth. Home of the Packet Mail Service and the Royal Navy, with ships calling there "for orders", it had always been one of Britain's most important ports. But in 1825 Falmouth assumed an even greater profile, its streets "thronged with people...the hotels and principal houses consequently filled... as the agents and others engaged for the different mining speculations abroad are assembled and waiting to sail for their various

destinations” (Royal Cornwall Gazette, 19 Feb 1825). Throughout 1825 various mining companies sent unprecedented numbers of men and amounts of equipment to all parts of Latin America.

It is difficult to ascertain with any precision how many men from Cornwall were recruited in 1825 for Latin American mines, but it was certainly many hundreds. Yet how do we explain the apparent paradox of the migration of Cornish miners and artisans at a time when their native industry was at its zenith? Working conditions and wages in the western mining districts, for example, St Just, were lower than those further east in central Cornwall such as Gwennap and Kea. But wages and conditions in the smaller metalliferous region of South Devonshire, around Tavistock and North Molton, were, on average, better than those offered in the densely populated central mining districts of Cornwall (Brooke 239). This had prompted a “culture of mobility” that had also witnessed the departure in the early 1800s of Cornish miners for other mining regions in Britain - Somerset, Shropshire, South Wales, Anglesey and the Pennines. Cornish miners were therefore accustomed to migrate in search of work, better pay and conditions before the appearance of Latin American companies in the 1820s. Known as “tributers”, miners in Cornwall were used to working under a system akin to self-employment that was often responsible for great variations in wages³. Those on offer in Latin America were much higher, and the system of payment devised by the new American companies - for a fixed salary with regular quarterly disbursements paid direct to a Cornish bank - was an attractive proposition. This offered their families the prospect of financial stability and the added incentive of rising higher up the mining hierarchy than was possible in Cornwall. Captain Joseph Malachy, engaged in 1825 by the Bolívar Mining Association

to manage the Aroa Mines in Venezuela, was hired on the fabulous salary of £1,200 per annum, around four times the average annual wage of a Cornish mine manager. So began the process of overseas mining migration from Cornwall, a movement that was to have a significant impact on the development of the global mining economy, and for future British relationships with many mining regions throughout the world.

The bubble bursts: failures and setbacks

By the end of 1825, Cornish miners and other labourers, along with specialised machinery, had reached some of the most inaccessible parts of South and Central America. Yet hopes entertained by British shareholders of a rapid and generous return on their investment were dashed in 1826, as a number of the mining companies failed when capital was suddenly withdrawn. The prime reason for this sorry state of affairs was the collapse of the London Stock Market. Rippy sees the flotation process of the Latin American Government bonds as the root cause of the malaise that allowed merchant bankers and swindlers to rig the market (125). The result was financial mayhem, which had catastrophic consequences for the fledgling mining enterprises in Latin America. Only a fraction of the authorised capital for the mining companies was ever paid in (see Table 1) and Rippy estimates total losses probably amounted to over 3 million pounds sterling (129).

Among the casualties were the Anglo-Chilean, Castello, Chilian, Chilian and Peruvian, Famatima, Haytian, Pasco-Peruvian, Río de la Plata, Tarma, Tlalpujehua and United Chilian. And others might well have collapsed too had it not been for the fact that they were bound by contracts with Latin American mine owners to continue for a specified period. The Anglo-Mexican Mining Association was one such company that

had to keep working, creating a headache for shareholders that were forced to dig deeply into their pockets (Rankine 30-1).

Although the stock market crash was undoubtedly the prime cause of failure, other factors contributed also. The sheer novelty of transporting heavily capitalised, mechanised enterprises to regions that had neither the economic, social nor political infrastructure to cope, led to problems. Steam engines landed at Tampico, Mexico, sank in the sand, whilst ironwork and other equipment was lost offshore never to be recovered. As the Pasco-Peruvian Company discovered, logistical problems were encountered in getting heavy equipment to remote areas through regions with no proper roads. Climatic conditions and disease depleted imported labour that were costly to replace. Political instability did not help either; in Mexico, attempts to work mines were frequently hampered by the activities of bandits necessitating the construction of huge walls around mining establishments for protection.

Failure was also precipitated by the over-hasty purchase of mines, founded on wildly inaccurate descriptions that appeared in prospectuses, of both their mineral potential and locations. Cornish miners sent to Argentina in 1825 by the Río de la Plata Association were sent back home by the company because it had failed to secure the mines it had planned to work (Quarterly Mining Review, 1830 81-106). Indeed a warning note concerning the ad hoc and naïve methods of business conducted by Europeans had been sounded in 1825 by onlookers in Valparaíso, Chile:

They seem to think our mountains are made of gold and silver, and that they can carry them away at pleasure; but in opinion, before a twelvemonth elapse, the golden ideas may be soldered down. Certain it is, that the worldly directors at home have not adopted the most judicious mode of acting; they have sent out their workmen and agents to work mines they have yet to buy, which purchases will cost them one hundred times more than if they had adopted the more sober plan of buying quietly (Western Luminary 7 Feb 1826).

The benefit of hindsight caused Captain F.B. Head to write scathingly of such a *modus operandi* in 1827:

many of the Commissioners purchased...mines at exorbitant prices, at distances of seven or eight hundred miles from each other; and while the natives were smiling at the Cornish *tanners*, who were standing on the sunny sides of the street, devoured by mosquitoes, and cutting water-melons the wrong way - the governments began to ask for *loans!*" (Quarterly Mining Review, 1830 101).

Yet however inauspicious the start of British mining enterprise in Latin America might have been, many companies that survived the stock market crash, including the Real del Monte, Imperial Brazilian and Anglo-Mexican, continued to operate. And the following decade saw the successful rise of companies from the ruins of many of the earlier failures, including the Chilean Copiapó Mining Company, and new enterprises such as the Brazilian company of St John D'el Rey, and the Royal Santiago Mining Company and the Cobre Mining Association at Cobre, Cuba. The significance of these early enterprises to the British lay in the fact that it was Great Britain and not another foreign power that had established the groundwork for a much greater financial penetration of Latin America. Joining the British merchants who had already made their way to South

America in the years following the end of the Napoleonic Wars, mining facilitated the migration of thousands more British citizens. These migrants were at first primarily Cornish miners and artisans, but were followed by growing numbers of merchants, traders and entrepreneurs who founded important British colonies in the Latin Americas.

Cult Figures? Assessing “Cousin Jack”

Here we must critically analyse the role and contribution of Cornish miners and their British made technology to the development of Latin American mines in order to avoid, as Payton has noted, the excesses of filio-pietism that has marred scholarship of ethnic migrations in the past (*Overseas* 17). Evidence suggests that the pre-eminent role the Cornish came to play in Latin American mining fields was by no means a foregone conclusion. The British incursion into Latin American mining was sudden and dramatic and the introduction of pioneering technology involving heavily capitalised and centralised methods of working held the potential for conflict especially in regions that already had a long and successful mining history built on age old traditions. Cornish miners as “the light infantry of British capital” were uprooted from familiar surroundings, shipped half way around the globe and transported to some of the most alien environments on earth. They inevitably bore the brunt of criticism.

In the early 1820s their suitability as “practical” miners was called into question when they were shown to be deficient in their knowledge of the geology of complex ore bodies of gold and silver. We learn for example in Charles Lambert’s letter to the Directors of the Chilian Mining Association in London in 1825 that he considered the Cornish of little use until they had been in Chile for some time: “they are still misled by

the different mineral deposits in this country” (Mayo and Collier 15). Moreover, he relates how Captain Tregonning presented specimens which he thought contained tin ores, such as were found in Cornwall, only to discover he was in error (Veliz 650).

Indeed Captain F.B. Head, commenting on the unsuitability of bringing tin and copper miners to work in gold and silver fields, had put his finger on a basic limitation of the Cornish miner which was to prove of increasing significance as modern technology developed towards the mid nineteenth century. Their practical skills, passed on and refined from generation to generation, were considerable. They had, as they put it, a “nose for tin”. But they had no underlying theoretical knowledge of geology, chemistry or physics to enable them adapt to new circumstances. Cornwall had, in the intellectual ferment of the mining boom, pioneered scientific societies to develop this knowledge - the Royal Cornwall Geological Society at Penzance (1814), the Royal Institution of Cornwall at Truro (1818) and later, the Royal Cornwall Polytechnic Society at Falmouth (1833). But there were no serious attempts at education for miners until the 1840s. For crucially, the learned societies’ membership, structure and cost made it very difficult for the working miner, or even a mine captain, to join. The result was that when miners came across complex new geology, such as in Latin America, they were often mystified.

Initial problems also arose between the fiercely independent Cornish miner who reacted adversely to being ordered about by military men who had been selected by the mining companies to direct affairs, and often knew little about mining. Problems quickly arose between Scotsman Captain James Vetch and the Cornish miners at Real del Monte, whom the former found to be “the most difficult we have to manage...and the most ungrateful” (Todd, 36). Vetch even proposed replacing the Cornish by drafting in miners

from Ireland, Scotland and Northern England. Captain Andrews of the Chilian and Peruvian Mining Association also found the Cornish, who were constantly bickering with a group of Welsh miners, objectionable, preferring miners from Germany who were:

more hardy, patient, and enduring, and far less nice and punctilious about trifles. Cornishmen are intractable if put the least out of their way. They harmonize together “one and all”, but not with strangers; and their dispositions and habits by no means correspond with the tried, placid tempers and dispositions of the South Americans. (Vol 1, 209-210)

Centuries of successfully working the mines in Cornwall on a system akin to self employment had conspired to give the miner of the West of England “frank and blunt manners” often mistaken for insolence. A “character of independence - something American” therefore existed amongst the Cornish population that was undoubtedly responsible for many a misunderstanding in these early years (BPP 759).

That the Cornish had brought their steam engines to a state of great perfection in Cornwall is beyond dispute, but how suitable was this technology to Latin American mines? The picture is somewhat mixed. Mexico, with its deep and flooded silver mines, proved to be the country most predisposed to steam. Engines were readily accepted at the mines of the Real del Monte and Bolaños companies, over which mining doyen John Taylor exercised control. A great supporter of steam technology, his belief as to its suitability for Mexican mines had been galvanised by the successful operation of a Cornish steam engine dispatched in 1819 to drain the Conception Mine in the Real Catorce (Todd 31). Taylor was convinced that steam engines were vastly more efficient and cheaper than the native system of using malacates (horse-powered machines for

raising ore and dewatering mines). A series of engines with cylinders ranging from 36 inch to a massive 70 inch, were manufactured in Cornwall and dispatched to Mexico during the course of the nineteenth century. At Bolaños, 44 malacates employing 2,000 mules (50 to each malacate) overseen by 384 drivers, stable boys and others, had cost, between 1791 and 1798, £79,552 each year. By the late 1820s the mine was being drawn by one steam engine and one waterwheel. At Real del Monte, the number of malacates had been 32, employing 1,380 horses and 288 men, the expense of which had amounted to nearly £70,000 annually. But the cost of drainage by steam was about £8,000 a year, effecting an annual saving of £62,000, although the mine was being worked at far greater depths (Quarterly Mining Review 1836, 359). What must not be forgotten however, is the enormous cost of buying and then transporting these engines across the Atlantic. In 1829 a 36 inch cylinder engine for Bolaños was lost off the coast of Mexico, and although the company was insured, this incident incurred an additional £3,600 (Quarterly Mining Review, 1831, 337). Maintenance was also problematic. Repairs to engines were often delayed for several months because orders to Cornwall for additional components were complicated by distance, taking a long time to arrive in Mexico.

Concerns as to the suitability of fuel-hungry engines in areas where there was no coal and a shortage of timber or alternative fuel greatly concerned the management of the Anglo-Mexican Company in 1825. Initially installing steam engines at their Guanajuato mines when there was a shortage of mules to work malacates, they were forced, by a division of opinion in the company, to become primarily dependent on Mexican methods (Gilmore 80; Rankine 29). In Brazil this type of technology made very little impact, much of the dewatering, stamping and amalgamation being effected through a

sophisticated system of waterwheels. But as Eakin has commented, although water technology was not new (being known in European mining regions), it was its application by the British “on a rational, large-scale and systematic basis” that was (*Role of British Capital*, 13). In Chile, the role steam engines could play was curtailed by a scarcity of water and they were of little practical use in mines worked on shallow copper deposits.

In the island of Cuba steam engines were found to answer very well. Engines ordered by the Royal Santiago Mining Company, of which Michael Williams was a co-director and financier, were cast in his family’s Perran Foundry. The neighbouring mining sett of the Cobre Mining Association, directed by C. Pascoe Grenfell, ordered their engines from Harvey’s Foundry, Hayle. Dispatched to Santiago de Cuba along with hundreds of Cornish miners, engineers and artisans from the mid 1830s, these engines provided the means by which a large supply of copper found its way onto the international market in the 1840s, challenging Cornwall’s hegemony in copper production. Steam engines continued to make an impact in Latin American mining fields in the following decades as Cornishmen introduced the technology to Tocopilla, Bolivia in the late 1860s. Engines were once more dispatched to Cerro de Pasco in 1869 and to Real del Monte right up to the twentieth century. The Cornish style engine houses built to accommodate these engines remain potent symbols of British industrial prowess particularly in the districts of Real del Monte and Zacatecas, Mexico, today, marking the arrival of the industrial revolution in Latin America. Yet it has to be said that, overall, steam technology proved not to be the panacea for Latin American mines that it had been for Cornwall. This was primarily due to a lack of suitable fuel and initially, the huge

distances between the foundries in Cornwall and elsewhere that cast them and the mines to whence they were sent.

The picture is also mixed as regards the introduction of Cornish methods of working mines. In Mexico for example, Cornish miners and managers were initially welcomed as heralds of economic rejuvenation and progress, particularly in areas where war had resulted in the depopulation of settlements and a shortage of skilled miners. However, Cornishmen soon encountered resistance from native miners whose refusal to accept innovative changes to the labour structure frustrated their plans for improvements. Particularly contentious was the introduction of the Cornish “tribute” system for working mines. This meant abandoning long-established traditional modes of operating, in this instance the “partido” system⁴. British mine directors and managers alike believed the “partido” to be responsible for a loss in profit to the mines, but also to be dangerous. Mexican miners had a rather ad hoc manner of working underground, choosing what area of the mine to work and this practise often resulted in a maze of unstable tunnels and galleries. J.W. Williamson, the Director of the Anglo-Mexican Mining Association, wisely foresaw that British companies had much to learn from the native miners, and that all which could be reasonably expected was a modification of Mexican practise by European methods. He was proven right when native miners were provoked into strike action in defence of their customary rights in the late 1820s at the mines of Real del Monte, Zacatecas and Guanajuato upon the abandonment of the “partido”. This provided a salutary reminder to the British management and their Cornish mining captains of the danger of trying to graft a foreign system of mining onto an industry equally as old and proud as their own. In Chile, Cornish superintendents found that the introduction of

windlasses and kibbles for raising ores were often dismantled because the native proprietors preferred the ancient Chilean mode of raising ore - in bags on the backs of “apires” (workmen hired to convey ore) (Henwood 145).

Steam perhaps did not make the quite the impact in Latin American mining that it had done in Britain with its huge coal reserves, but the Cornish could offer a variety of other skills and innovations. They introduced sophisticated methods of deep-shaft mining, able to bore and blast through hard rock hundreds of fathoms underground with sophisticated drilling techniques. Known as “single” or “double jacking” the Cornish used reinforced iron rods that were sharpened at the centre of one end, the former method undertaken by one man, the latter a group of men, striking the drill known as a “boryer” with sledge hammers. Black powder (and later dynamite) was inserted into the drilled holes specially made in a sequence which would carefully shatter the rock-face, a technology that had been perfected over centuries of working mines sunk in Cornwall’s granite. They also introduced the miners’ safety fuse that reduced the number of accidents primarily due to miss-timed or misfired holes. This was invented at Tuckingmill near Camborne, Cornwall, in 1831 by William Bickford and had found its way to Latin American mines by the late 1830s (the Cobre Mines in Cuba regularly imported safety fuse from Tuckingmill from around 1836). Overall, the Cornish method of mining was planned and organised for safety and efficiency with safe ladder arrangements, skilled timbering and ore-hauling techniques.

The Cornish were also highly valued for their skill as ore dressers, masons, wheelwrights and carpenters. Much of the machinery installed at the surface of Brazilian gold mines at Gongo Soco and Morro Velho for example was the work of Cornish

carpenters who constructed the huge waterwheels and stamps. The Cornish could not greatly improve upon the native method of silver amalgamation - the ancient patio process. Nor, it has to be said, could the Germans. (It was only with the introduction of cyanide treatment of ores by American mining companies in the early twentieth century that any major advances in amalgamation occurred). But the Cornish produced successful innovations in gold and copper refining. In the Colombian gold mines in the 1830s for instance, Captain John Carthew had introduced a new system of dressing in a Cornish “tye” (a long trough to separate roughs from slimes by washing). This had “succeeded beyond expectation” resulting in a reduction of gold loss from 60 - 70 per cent to approximately 37 per cent. “It is now certain that that dressing in Cornish tyes offers decided advantages over every other method hitherto employed”, commented Mr Bodmer, “and that it must be introduced without delay” (Quarterly Mining Review, 1830: 516). And in the Aroa copper mines of the Bolívar Mining Company, Cornishmen in the reduction department made significant advances in the calcination process of copper ore (HJ/1/17; Royal Institution of Cornwall).

“English labourers are less expensive in proportion to the work performed”, commented Captain Cotesworth of the Cata Branca Mine in Brazil, “and preferable in every respect to other nations or Negroes” (Mining Journal 22 Jul. 1837). Echoing this sentiment was the mine manager of the Colombian Mining Association. He had introduced the tribute system finding that the Cornish miners could work hard and difficult stopes far more cheaply and efficiently than native labourers, who were “but inferior miners, being but little accustomed to blast and break the ground” (Mining Journal 22 Apr. 1837). At the Imperial Brazilian Mining Association’s mines at Gongo

Soco, G.V. Duval agreed that the native workforce “cannot supersede the necessity of a supply of good miners from England” (Mining Journal 24 Jun. 1837). His conclusion: “I am afraid that it will never be possible to render you entirely independent of English labour and of home engagement” (Mining Journal 29 Jul. 1837), conveys how important he considered his Cornish workforce to be to the success of his company. In 1843 The Mining Journal described Gongo Soco as the chief English mining establishment in Brazil, employing around 100 Europeans, of whom most were Cornish, forming a distinct community, “performing their national dances and songs” and having their wives and families with them. Indeed, the presence of British mining companies in the region had, between 1835 and 1848, enhanced Coaces from a “trifling place...since the English having been living so near, and expending many thousands yearly in it, it has become very opulent” (25 Feb.).

Although in Mexico and Chile, Cornish miners and their methods initially experienced a less than enthusiastic welcome and many returned home, their role was far from diminished. For in the following decades they showed great adaptability, learning how to work with native miners and studying and accepting many of their techniques which they blended with Cornish mining methods creating a new generation of miners, more skilled than ever before. As in Brazil and Colombia, Cornish miners in Mexico, Venezuela, Cuba, Peru and Chile came to occupy positions at the top of the mining hierarchy, in supervisory roles and managerial positions, so although their numbers fell, their level of influence did not. By the 1830s Cornish mining captains and their Cornish workforce were to be found in mines across Latin America, as the cult following that the Cornish miner was to enjoy into the twentieth century began to take effect. Some

examples include Captains John Trebilcock and Sampson Waters who managed mines for the Copiapó Mining Association in Chile. Captain Thomas Treloar “the Brazilian Gold King” worked at the Morro Velho Mine of the St John d’el Rey Mining Company. Captain J. Tregonning was at the Gongo Soco Mines of the Brazilian Mining Association and John and William Rule at Real del Monte, Mexico. Captain Trewartha worked for the Colombian Mining Association, Captain John Reynolds for the Cobre Mining Association in Cuba and Captain John Carthew for the Bolívar Mining Association, Venezuela.

Countless shafts, winzes (a sink on a lode communicating one level with another) adits and cross cuts of mines all over Latin America bear Cornish names and in many areas the physical presence of their industry can be seen on the landscape in the form of Cornish engine houses. Although some of the early mining ventures failed, the test of time proved the effectiveness of the combination of British capital and Cornish skill, allowing a renaissance in mining in many regions. Indeed, Veliz has concluded that had it not been for the financial disaster of 1826, the mining companies in Chile (see Table 1), from which the Copiapó Mining Association was to rise phoenix-like in the 1830s, would have prospered (644). And although the British mining venture in Real del Monte, Mexico, has been described as a failure, Randall invites another interpretation. By arguing that the modern, structured company which reverted back to Mexican ownership was unrecognisable from the run down enterprise that the British had acquired a quarter of a century before, he concludes that the British company with its Cornish miners did in fact permit the expansion and development of mining in the Real del Monte region. Ironically soon after the end of the British period of management, one of the mines they

had controlled, went into bonanza (219). But crucially, metalliferous mining helped to pave the way for further British investment opportunities in other industries including engineering, foundries, railway construction, nitrates, coal, shipping, banking, trade and commerce.

Latin America: cradle of the developing international mining labour market

The success of the opening-up of Latin America to British capital lay in the fact that it allowed the rehabilitation and subsequent revival of mining in areas that had been devastated by war or neglect. Despite the stormy years of 1826, Britain gained the foothold in Latin American trade that had eluded her for so long, successfully extending the frontiers of her “informal empire” through trade stimulated by the expansion of metalliferous mining that promoted British settlement.

Cornish miners were at the cutting edge of this process and without their involvement, it is doubtful whether British mining ventures would have enjoyed the success they did. But the relationship was clearly a symbiotic one. For without the migration of British capital, Cornish miners would not have been afforded the opportunity to acquire the essential skills in mining and dressing gold and silver to add to their knowledge of tin and copper which enabled them to enhance their skills still further and acquire the reputation of being the best hard rock miners in the world. Indeed, many miners who remained in Cornwall were backward in comparison to the “Cousin Jacks” who ventured overseas. By the late nineteenth century there was barely a mine in the world that did not have Cornish labour, and many had Cornish mine captains, even those that were not metalliferous mines, for example coal and nitrates. The cult following that

the Cornish miner earned was of great importance for Cornish miners and Cornwall itself, but ultimately also for Britain. As one of Britain's earliest industrial regions the migration of capital and labour in the 1820s meant that Cornwall began not only to export its skilled workers, but also developed a world class export trade in mining machinery and technology. This enhanced the prestige of equipment "made in Britain", while providing much needed money to the Cornish economy. Financial contributions came also from miners' remittances, paid direct to Cornish banks, the genesis of the "dependency" phenomenon which would so characterise Cornwall of the late nineteenth century (Payton *Making*, 99-114). But one of the crucial reasons for the large numbers of Cornish miners to be found in mining fields around the globe, was because the seed of the international mining economy sown in Latin America had taken root and flourished to encompass mining fields worldwide.

And it is this development that is crucial to the understanding of the complex relationship that existed between Cornwall, Britain and Latin America. Without the valuable lessons learnt in the mines of South and Central America in the early nineteenth century, it is doubtful whether the Cornish, although already good practical miners, would have been in such a strong position to migrate to developing gold and silver mining regions (in addition to tin and copper) and dominate as they did. In these new mining areas they commanded key positions, moving from one country to another, as the fortunes of the international mining economy waxed and waned. Gold and silver regions that were developed by "Cousin Jack" included the Californian gold fields and the silver mines of the Comstock in Nevada, USA. J.D. Borthwick notes in his Three Years in the Goldfields, that the first real miners in the Placerville district of California were Cornish

miners from Mexico and South America (qtd. Todd 131). Dawe has found numerous examples of miners originally from Cornwall who had migrated direct from Latin America to the Transvaal, Africa (107-108). Miners in Australian gold fields included Cornishmen from South and Central America, and much the same picture is true for those in Mysore, India and the Gold Coast, West Africa, in the late nineteenth century. Cornwall became a major migration centre for a skilled and mobile work force that gave rise to a Cornish transmigrant community spanning the globe by the early twentieth century. But the first of such communities were in Latin America - Gongo Soco and Morro Velho in Brazil, Tocopilla on the Pacific Littoral and Pachuca and Real del Monte in Mexico. Such settlements later included Mineral Point, Wisconsin, Grass Valley, California, Virginia City, Nevada and Butte in Montana; Moonta, Kadina and Wallaroo in South Australia; Johannesburg and Randfontein in South Africa. In these communities, Cornish miners were numerically strong and in effect became the “flag bearers” of Britain’s empire, both formal and informal:

Some say of the Cornish miner
His home is the wide, wide world,
For his pick is always ringing
Where the Union Jack’s unfurled. (Thomas, 350)

Moreover, the existence of such “little Britains” became a matter of great importance for the British Empire particularly in the Transvaal in the years leading up to the Anglo-Boer War. For over 25 percent of the white population in the Transvaal were Cornish miners (qtd. Burke 59). As markets became increasingly interdependent, an integrated labour

market emerged in which the Cornish, as the most visible imported workforce from the very beginning of the global mining market in Latin America, dominated. For Cornwall, this process resulted in the international recognition of a small yet unique region of the British Isles, marked as much for its migration as for its skills in hard rock mining.

Sharron P. Schwartz

Institute of Cornish Studies

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Notes

¹ There is no clear consensus on how the Cornish miners acquired this name, but evidence seems to point to the mines of Devonshire in the eighteenth century, where migrant Cornish miners sought work. The term “Cousin Jack” is also thought to have been used to express an “otherness”, the Cornish considering themselves a distinct people with specific mining skills that they jealously guarded.

² Cornish engineer J. Hornblower, had exported a Cornish pumping engine to the copper mines of New Jersey, USA, in 1752.

³ Tributers contracted to work a “pitch” - an area in the mine that had been examined by the Mine Captain - for a previously agreed price. They received a proportion of the value of the ores raised.

⁴ The Mexican mining system was ancient and complex. Put simply, “buscones” mined the ore wherever it looked promising, and hired “tenateros” to carry it to the surface. Mexican miners received half the ore raised in this way - the “partido”.

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