CREATING THE CULT OF "COUSIN JACK": CORNISH MINERS IN LATIN AMERICA AND THE DEVELOPMENT OF AN INTERNATIONAL MINING LABOUR MARKET

Over the last 25 years, British involvement in the nineteenth century development of Latin American mining resources, particularly in Mexico, Brazil and Chile, has received the attention of historians who have focussed on, among other things, capital investment, economic re-structuring and industrial modernisation.[1] Many works have explored the evolution of British migrant communities across Latin America[2] yet, so far, there has been scant research that addresses the regional contribution to the expansion of British industrial prowess in nineteenth century Latin America.

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[111] Marshall Eakin, *British Enterprise in Brazil:The St John D'el Rey Mining Company and the Morro Velho Mine, 1830-1960*, (Durham and London: Duke University Press, 1989); Marshall Eakin, "The role of British capital in the development of Brazilian gold mining", in *Miners and Mining in the Americas*, Thomas Greaves, and William Culver, eds (Manchester: Manchester University Press, 1985), 11-30; Marshall Eakin, "British Imperialism and British Enterprise in Brazil: The St John D'el Rey Company, Limited, 1830-1960, *Hispanic American Historical Review*, 66/4 (1986), 697-741.
John Mayo, "Before the Nitrate Era: British Commission Houses and the Chilean Economy, 1851-80", *Journal of Latin American Studies*, 11/2 (1979), 283-302. John Mayo, "Britain and Chile, 1851-1886: Anatomy of a Relationship", *Journal of Interamerican Studies and World Affairs*, 23/1 (1981), 95-120. John Mayo, *British Merchants and Chilean Development, 1851-1889* (Boulder and London: Westview, 1986). John Mayo, "Commerce, Credit and Control in Chilean Copper Mining before 1880", in *Miners and Mining in the Americas*, Thomas Greaves and William Culver, eds (Manchester: Manchester University Press, 1985), 29-48. John Mayo and Simon Coliver, *Mining in Chile's Norte Chico: Journal of Charles Lambert, 1825-1830* (Boulder and Oxford: Westview, 1998). Robert W. Randall, *Real del Monte: A British Mining Venture in Mexico*, (Austin: Texas University Press, 1972); Robert W. Randall, "British Company and Mexican Community: The English at Real del Monte, 1824-1849, *Business History Review*, 59/4 (1985), 622-644. Barbara A. Tenenbaum and James N. McElveen, "From Speculative to Substantive Boom: The British in Mexico, 1821-1911", in *English Speaking Communities in Latin America*, Oliver Marshall ed. (London: Macmillan Press Ltd, 2000), 51-79.

[2] Some examples include: John E. Baur, The Welsh in Patagonia: An Example of Nationalistic Migration, *Hispanic American Historical Review*, 34/4 (1954), 468-492. E.G. Bowen, "The Welsh Colony in Patagonia 1865-1885: A Study in Historical Geography," *Geographical Journal*, 132/1 (1966), 16-27.
Alexander Graham-Yooll, *The Forgotten Colony* (Buenos Aires: L.O.L.A. Literature of Latin America, 1999). Oliver Marshall ed., *English Speaking Communities in Latin America*, (London: Macmillan Press Ltd, 2000). Hilda Sabato and Juan Carlos Korol, *Cómo fue la Inmigración Irlandesa en Argentina* (Buenos Aires: Editorial Plus Ultra, 1981). Patrick McKenna, "*Nineteenth Century Irish Emigration to, and Settlement in, Argentina*, unpublished MA thesis, National University of Ireland, Maynooth, (1994).

Situated at the extreme south west of Britain, Cornwall is a 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.

From the 1970s there has been an increased awareness of the benefits of studying regions when looking at the process of industrialisation. This shift in spatial focus has uncovered combined and uneven regional patterns of industrialisation in Britain and drawn attention to Cornwall's leading role in the British industrial revolution. Sidney Pollard was among the first to identify Cornwall, an early centre of metal mining and steam engineering, as one of Britain's ten earliest industrial regions.[3] Building on Pollard's work, Eric Richards, calling for "a better taxonomy of the regional paths adopted during industrialization", identified Cornwall as one of the regions on the margins of industrialisation.[4] More recently, Pat Hudson's work on the "really important spatial units of the industrial revolution" – distinct and specialised regions with extra-regional commodity exports - has placed Cornwall at the forefront of early British industrialisation and structural adjustment.[5]

[3] Sidney Pollard, "Industrialisation and the European Economy", *Economic History Review*, 26 (1973), 636-48. Although in the very early nineteenth century, Cornish mining was restricted almost entirely west of Truro, and a small area in the Tamar Valley, as the century progressed the dynamic mining sector expanded and new mining areas were developed in the centre and east of Cornwall.
[4] Eric Richards, "The Margins of the Industrial Revolution" in *The Industrial Revolution and British Society*, Patrick O'Brien and Roland Quinault eds (Cambridge: Cambridge University Press, 1993), 225.
[5] Pat Hudson ed., *Regions and Industries: a Perspective on the Industrial Revolution in Britain* (Cambridge: Cambridge University Press, 1989).

Important advances have also been made in the field of area studies.[6] Instead of viewing the world as being divided into a set number of large, quasi-continental regions, new, less rigid models of global scholarship are re-framing area studies around oceans and sea basins.[7] There is an increasing emphasis on looking at the world as not being divided into knowable, self-contained "areas" but as part of an inter-linked whole in which people, ideas, capital, and technology are connected across great physical divides. The fact that the prevailing *Zeitgeist* is currently moving away from amorphous or artificially constructed geographical entities to areas that have been previously overlooked as significant sites in and of themselves, has particular resonance for littoral societies, as it enables them to be viewed not as peripheries of nation-states or territorial civilisations, but as communities in their own right.[8]

With this advance in area studies and the new epistemological approach to understanding the role of regions in the British industrial revolution, it is now timely to investigate the role of *regional* contributions to the overseas expansion of British industrial prowess in the early nineteenth century. This essay challenges the accepted homogeneity of the process, invariably described as British, by concentrating on the pioneering exportation of metalliferous mining skills and steam technology to Latin America in the first half of the nineteenth century by Cornish miners, or "Cousin Jacks", as they were colloquially known. The argument this essay advances is that even amid the momentous scale of internationalized mass migration and transnational industrial exchange, local and regional identities will assert themselves as immigrants contest and

[6] Toby Volkman, "Crossing Borders: the Case for Area Studies," *Ford Foundation Report*, 29/1 (1998). Since 1995Volkman has been responsible for the Ford Foundation's work in area studies and has developed a new $25 million initiative, "Crossing Borders: Revitalizing Area Studies."
[7] Martin Lewis and Kären Wigen, "A Maritime Response to the Crisis in Area Studies," *Geographical Review*, 89/2 (1999), 161-68. The authors were engaged in a five-year research project entitled "Oceans Connect: Culture, Capital, and Commodity Flows Across Basins" at Duke University USA, funded by the Ford Foundation that concluded in summer 2002.
[8] Heidi Slettedahl Macpherson and Will Kaufman, eds, *New Perspectives in Transatlantic Studies* (Lanham: University Press of America, 2001), xiv.

negotiate their roles as social actors. For it was in the mines of Latin America that the coveted crown of mining excellence was contested between both immigrant and native Amerindian ethnic groups competing to achieve a hegemonic position in the rapidly expanding global mining labour market.[9] This essay will demonstrate 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.

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.[10] 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 tin, copper, and lead mining and engineering. 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.[11] It is claimed that by the early nineteenth century, Cornish copper mines were comparable in size,

[9] Sharron P. Schwartz, "The Making of a Myth: Cornish Miners in the New World in the Early Nineteenth Century" in *Cornish Studies* 9, Philip Payton ed. (Exeter: University of Exeter Press, 2001), 105-126.
[10] Carlos Prieto, *Mining in the New World* (New York: McGraw-Hill, 1973).

scale and capitalisation to any industrial or commercial enterprise in Britain and probably Europe, as copper ore production soared.[12] With its powerful capitalised industry and organised labour force, Cornwall had established a clear comparative advantage in metal mining in a similar way that Lancashire had in cotton textile manufacture.[13]

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. Cornwall was a region devoid of coal reserves, so it was vitally important to keep fuel consumption, and therefore costs, as low as possible, which challenged the minds of contemporary engineers and scientists who migrated to work on the Cornish mines. These included Matthew Boulton, Scottish born William Murdoch from the Soho firm of Boulton and Watt, and the Hornblower brothers from Shrophire. Together with Cornish born engineers, the most famous of whom was Richard Trevithick, inventor of the world's first practical steam carriage in 1801 and the high pressure steam engine and Cornish boiler, they ushered in a period of creativity that commenced in the late eighteenth century and lasted until the 1840s.[14] 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.[15]

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[11] Roger Burt, "The Transformation of the Non-ferrous Metals Industries in the Seventeenth and Eighteenth Centuries", *Economic History Review*, 48 (1995), 42.
[12] Roger Burt, *John Taylor: Mining Entrepreneur and Engineer 1779-1863* (Buxton: Moorland, 1977), 29. See also John Rule, *The Vital Century: England's Developing Economy 1714-1815* (London: Longman, 1992).
[13] Bernard Deacon, "Proto-regionalisation: the Case of Cornwall", *Journal of Regional and Local Studies* 18/1 (1998), 27-41. Cornish copper grew faster than all other major national industrial sectors before 1770 and between 1780 and 1830 Cornish copper witnessed a steady growth outstripped only by cotton textiles and iron.
[14] Three of the best biographies of Trevithick are Francis Trevithick, *Life of Richard Trevithick* (London: Spon, 1872, 2v). Henry Winram Dickinson and Arthur Titley, *Richard Trevithick, the Engineer and the Man* (Cambridge: Cambridge University Press, 1934). Anthony Burton, *Richard Trevithick: Giant of Steam* (London: Aurum, 2000).
[15] John Griffiths, *The Third Man: The Life and Times of William Murdoch 1754-1839* (London: Andre Deutch, 1992), 239-242. John Kanefsky and John Robey, "Steam Engines in 18th Century Britain", *Technology and Culture*, 21 (1980), 176-177.

Without significant advances in technology, the maintenance of this comparative edge in metal mining and stream engineering would have been impossible. Pat Hudson argues that successful industrial regions were those capable of generating a series of significant innovations in technology.[16] Moreover, she also asserts that the organisation of work and work practice prevalent in successfully expanding industrial regions often comes to influence the methods of an entire sector.[17] Latin American mine owners, alarmed at the decline of their once mighty industry, began to consider that the introduction of British manufactured steam engines and mining techniques might hold the answer to a revival in their fortunes and looked to Cornwall to supply the technological expertise and labour.

The Peruvian precedent: the migration of the industrial revolution to Latin America

The unstable political and economic background in Latin America was the setting for the opening chapter that heralded a new epoch in Britain's relations with Latin America - the export of Cornish engines to unwater and make profitable the silver mines of Cerro de Pasco in Peru, under the management of a Peruvian company formed in 1812.[18] This marked a change in attitude concerning the sharing of industrial knowledge and expertise with foreign nations, arguably driven by Britain's desire to gain a legitimate commercial foothold in Latin American markets that had been previously barred by Spain and Portugal. In 1811 one of the directors had discovered and purchased a model of a Cornish engine in London that had been manufactured by Richard Trevithick. When this model engine was set 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.

[16] Pat Hudson, *The Industrial Revolution* (London: Arnold, 1992), 23-24.
[17] Pat Hudson, ed., *Regions and Industries* (1989), 23.
[18] See Sharron P. Schwartz, "Exporting the Industrial Revolution: Trevithick and the Migration of British Steam-Engineering Technology to Latin America", *Journal of the Trevithick Society*, 28 (2001), 3-12. The company

In 1813 the company contacted Trevithick to place an order for several steam engines and to recruit the workmen to construct them. A historic Anglo-Latin American transatlantic mining contract, the first of its kind, was signed on 8th January 1814, with shares in the company traded on the London Stock Market. In 1814, a trio of skilled Cornish workmen sailed out of Portsmouth bound for Peru with a consignment of machinery dispatched by Trevithick.[19] 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, an event that can be said to have marked the transatlantic migration of the industrial revolution to Latin America.

The scale of the operation, in an era that preceded modern communication and transportation systems, was 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. July 1816 saw the dawn of the industrial revolution in Latin America when one of the engines drained a pit below adit level (beneath the level at which water will flow from a mine naturally) at the Santa Rosa Mine, astonishing a local official who described the innovation as "the most significant for the mining industry since the conquest of Peru."[20]

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consisted of Pedro de Abadía, a prominent Lima merchant, his partner Joseph de Arismendi, and a Swiss gentleman, Francisco Uvillé.

[19] This included 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.

[20] John Robert Fisher, *Silver Mines and Silver Miners in Colonial Peru, 1776-1824* (Liverpool: Liverpool University Press, 1977), 115.

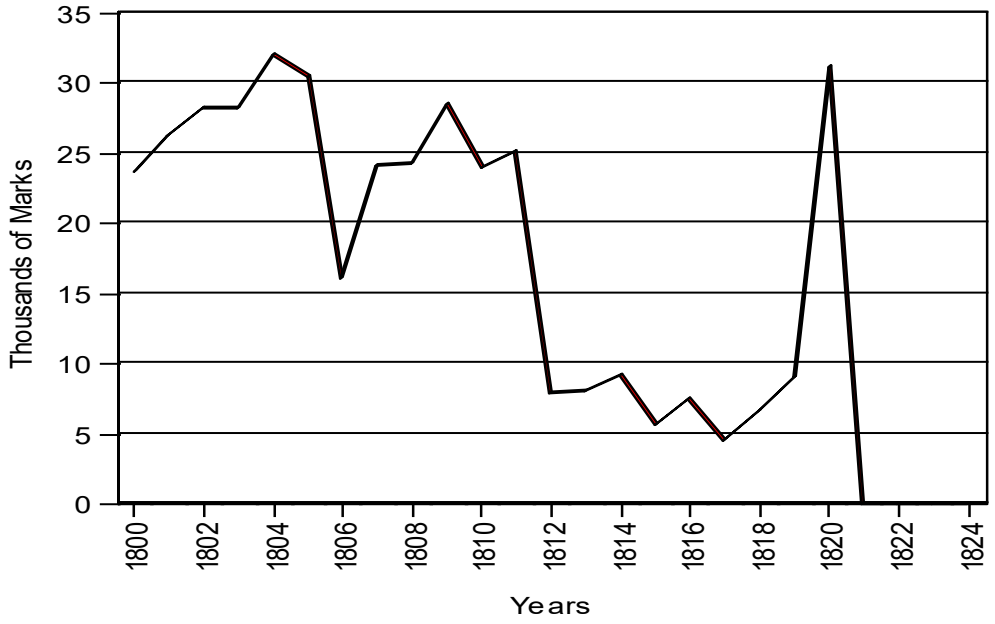

Fig. 1. Registered Silver Production for the Caja of Pasco, 1800-1824

Source, J.R. Fisher, 1977

The elation however, was to be short-lived, as component assembly and boiler problems prevented further progress, necessitating 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 ore lying below adit level to be exploited for the first time.[21] Silver registration at Pasco rose by 350 per cent in 1820, an increase

[21] John Robert Fisher, *Silver Mines and Silver Miners* (1977), 122.

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.[22]

However, 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. 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, but the figures for silver production at Pasco lead us to conclude otherwise.[23] 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 further exportation of the industrial revolution to South and Central America and the broadening of the frontiers of Britain's informal empire, in which the Cornish were to play a prominent role.

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[22] John Robert Fisher, *Silver Mines and Silver Miners* (1977), 144. Additionally, a party of Cornish lead smelters that arrived at Lima in 1819 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. See John Miller, *Memoirs of General Miller in the Service of the Rep. of Peru* Vol 2 (London: 1829), 143-44.

[23] See M. J. Fenn, "British Investment in South America and the Financial Crisis of 1825-26", unpublished M.Phil. thesis, University of Durham (1969), 100. Trevithick, left the Pasco mines after a dispute with one of the directors and attempted, with limited success, to work copper mines in Cajatambo and Chile. He ended up several years later prospecting for gold in Costa Rica and Nicaragua before returning to Cornwall penniless in 1827.[23] For details of Trevithick's exploits in Costa Rica, see D.W. Davies "Richard Trevithick in Costa Rica" *Journal of the Trevithick Society*, 5 (1977), 7-26.

A New World order: the migration of British capital

By the 1820s the volatile political situation had 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.[24]

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 and the newly independent Latin American countries courted Britain, the foremost nation with a capital surplus ripe for investment, 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. The Creole oligarchies deemed it preferable to allow British manufacturers and industrialists to fill the vacuum left by Spanish decline, in developing and supplying national needs.[25] This led to the opening up of the interior of Latin America to trade, ownership, management, and above all, investment.[26]

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

[24] Leyland Hamilton Jenks, *The Migration of British Capital to 1875* (New York: Knopf, 1927), 28.
[25] Simon Collier, Thomas E. Skidmore and Harold Blakemore eds, *The Cambridge Encyclopaedia of Latin America and the Caribbean* (Cambridge: Cambridge University Press, 1992), 223.
[26] Marshall Eakin, "The role of British capital" (1985), 16.

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.[27]

In Latin America, governments acted quickly to create the prerequisite conditions for foreign intervention in the mining industry believing mining to be the touchstone of economic prosperity and the basis on which foreign trade rested. Newly independent Mexico in 1823 rescinded those articles that had barred foreigners from the mining industry of colonial Mexico and the Brazilian Government too, relaxed restrictions imposed on foreigners by its ancient laws.[28]

[27] Fred J. Rippy, "Latin America and the British Investment 'Boom' of the 1820s", *The Journal of Modern History* (June 1947), 122-9.
[28] Robert W. Randall, *Real del Monte* (1972), 28-9. Newton R. Gilmore, "British Mining Ventures in Early National Mexico", unpublished PhD thesis, University of California (1956), 90. Henry English, *A General Guide to the Companies Formed for Working Foreign Mines*, (London: Boosey and Sons, 1825), 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 and Espirito Santo Brazil	Brazil	1,000,000	50,000
Chilian	Chile	1,000,000	75,000
Chilian 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
Haytien	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.

Source: English, 1825.[29]

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

[29] * 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. In addition to the above was the highly disorganised Catorce Company, Mexico.

expert)[30] and contained two basic points. Firstly, that the mines worked in colonial Latin America had been profitable, but had been hampered by a lack of modern machinery and a dearth of geological knowledge. Secondly, and more importantly, it was thought that the transfer of British capital, technology and skilled labour would be able to surmount any difficulties in developing a modern metalliferous mining industry in Latin America and that huge profits would ensue.

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, those from Cornwall far outnumbered them.

This transatlantic connection with Latin America meant that Cornwall came to occupy a transverse space, at once complex and fluid, positioned as it was between powerful global imperatives dictated by Westminster politics and City of London capital on one side of the Atlantic, and the Creole oligarchies' policies of economic reconstruction on the other. From this time on, Cornwall has looked both inwards – to the heart of the European and British polity – and outwards – via global connections forged during its historical experience and via the north-south links of the Atlantic Arc, reflecting its importance as a littoral society at the heart of the transatlantic world.

[30] See Alexander von Humboldt, *Political Essay on the Kingdom of New Spain*, 4 Volumes (London : Longman, Hurst, Rees, Orme, and Brown, 1811-1814).

Yet, although the head offices of the mining companies were situated in London, the metropolis was actually quite peripheral to the logistical arrangements of the transatlantic enterprises. It is here that this small peninsula at the far corner of Britain came to the fore as a region in the vanguard of developments in the modern global metalliferous mining economy. Cornwall featured strongly in the direction of the mining enterprises, the recruitment and subsequent transportation of skilled labour, the manufacture and export of technical and other equipment and also in financial backing.[31]

Cornishmen, and those with long-term business connections in Cornwall, featured on the board of directors of almost a third of the Latin American mining companies set up in 1824-5.[32] These men were representative of some of the most prominent and well connected mining and merchant families in Cornwall. 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. Michael Williams was associated with the Haytien, Imperial Brazilian and Pasco-Peruvian Mining Companies. His brother John was connected with the Chilean and the Río de la Plata Mining Associations and William with the Chilian 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 Chilian Mining Association. Truro man, T.F. Hornblower, of the United Chilian Mining Association, came from a long and illustrious line of engineers and just over the River Tamar in Tavistock, was John Gill, the proprietor of the Mount

[31] For more on this see Sharron P. Schwartz, "Cornish Migration to Latin America: A Global and Transnational Perspective", unpublished PhD thesis, University of Exeter (2003), chapter 4.

Foundry Iron Works, who became a Director of the Chilian and Peruvian Mining Association. Further afield was London-based C. Pascoe Grenfell; of Cornish descent, he was a Director of the Colombian and Brazilian Mining Associations. To this list must be added the name of John Taylor, a native of Norwich, England, who was the prime mover in the Bolaños and Real del Monte mining companies in Mexico, the precursors of many foreign ventures that were to be managed by the internationally known company of John Taylor and Sons. Although not of Cornish extraction, his association with the mighty Consolidated Mines of Gwennap, where he turned a failing copper mine into bonanza, and with other prolific producers, made his name synonymous with Cornish mining.

These men were connected with most of the leading figures in Cornish mining. Individuals known to John Taylor or the Williams' through links forged at local mines, or through kinship, were offered jobs in Latin America, the genesis of the global "Cousin Jack network."[33] 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 and Rule, in turn, recruited the most skilled and reliable miners and artisans known to him.[34] Cornish miners, with a prior propensity for moving about to gain the best wages and conditions, were attracted overseas by wages initially three times higher than those they were accustomed to, plus the security of a fixed term contract with home pay made in regular quarterly disbursements for the maintenance of their families, and the opportunity of rising far higher and quicker up the mining hierarchy than had they remained in Cornwall.

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[32] Sharron P. Schwartz, "The Making of a Myth", (2001), 109.

[33] For more on this see Philip Payton, *The Cornish Overseas* (Fowey: Alexander Associates 1999), 14-42.
[34] *Quarterly Mining Review* (1830), 438.

Although the head offices of the mining companies were centred in London, 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 specialist dialling apparatus, to mining tools, equipment and miners' clothing.

Men and machinery were dispatched from Swansea, Portsmouth, Plymouth and Liverpool, but by far the most was exported through the port of Falmouth.[35] 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 as various mining companies sent thousands of men (some with their families) and unprecedented amounts of equipment to all parts of Latin America. So began the process of overseas labour 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.[36]

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

[35] Of thirteen ships recorded in the local press as leaving for Latin America carrying men and mining equipment between March and July of 1825, eleven sailed from Falmouth and one each from Swansea and Plymouth.

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.[37] 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.[38]

Among the casualties were the Anglo-Chilian, Castello, Chilian, Chilian and Peruvian, Famatina, Haytian, Pasco-Peruvian, Río de la Plata, Tarma, Tlalpujuhua 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.[39]

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. Many of the mines were situated in remote and inaccessible regions, poorly served by roads or even navigable rivers. In Colombia there was a shortage of wheeled vehicles to convey equipment, and miners arriving in Mexico in 1825 found that they had to construct a road over which the imported steam engines could be transported from the coast inland to the mines of Real del Monte. Climatic conditions and disease depleted imported labour that was costly to replace. Political instability did not help either; in Mexico and Chile, attempts to work mines were frequently

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[36] Sharron P. Schwartz, 'Exporting the Industrial Revolution: The Migration of Cornish Mining Technology to Latin America in the Early Nineteenth Century', in Heidi Slettedahl Macpherson and Will Kaufman, eds, *New Perspectives in Transatlantic Studies* (Lanham: University Press of America, 2001), 143-158.
[37] Fred J. Rippy, "Latin America and the British Investment 'Boom'" (1947), 125.
[38] Fred J. Rippy, "Latin America and the British Investment 'Boom'" (1947), 129.
[39] Margaret E. Rankine, "The Mexican Mining Industry in the Nineteenth Century with Special Reference to Guanajuato", *Bulletin of Latin American Research*, 2/1 (1992), 29-48.

hampered by the activities of bandits necessitating the construction of huge walls around mining establishments for protection.[40].

Moreover, information contained in the mining prospectuses was, in many cases, revealed to be little more than humbug. Mines were often situated at incredible distances apart and were purchased at exorbitant prices by European Commissioners who knew little about their true geology. Agents and workmen were dispatched even before the ink was dry on contracts granting British companies mining rights. Misinformation abounded and was merely compounded by doing business in the cavalier atmosphere of Latin America, where corrupt local officials were apt to prevaricate, as the Río de la Plata Mining Association discovered in 1825. Upon arrival in Argentina, its workforce of Cornish miners was sent back home because it had failed to secure the mines it had planned to work, due to a *volte-face* by the local government.[41]

Yet another reason must also be considered – one that is explicit enough in mining reports and contemporary literature – and that is the suitability of the labour force selected by the mining companies both before and after the Stock Market crash. The Cornish were by far the largest ethnic group and therefore came in for the most criticism. But was this deserved?

The Cornish miner critically assessed

For those companies that survived the crash, including the Real del Monte, Imperial Brazilian, Bolivar, Colombian, Bolaños, and Anglo-Mexican, caution was the by-word. The same was true for the British-backed mining enterprises that rose phoenix-like from the ashes of failure in the early 1830s including the Copiapó Mining Company in Chile, and new companies that also emerged that decade. Among these were the St John del Rey Mining Company in Brazil, and those

[40] For a more detailed description, see Sharron P Schwartz, "Cornish Migration to Latin America" (2003), chapter 5.
[41] See the *Quarterly Mining Review*, (1830) 81-106.

formed to work abandoned colonial copper mines in Cuba, including the Cobre Mining Company and the Royal Santiago Mining Company. Since so many shareholders had been stung by the crash, reports in the *Mining Journal* thereafter reveal a constant suspicion of managerial and/or company impropriety. This included fears of bogus assays, the issuing of inflated or misleading reports of the mineral potential of a mine, or managerial attempts to misinform shareholders by concealing the truth about the working of a mine or the competence and behaviour of its workforce. As many of the mine managers and senior staff were Cornish they bore the brunt of the criticism.[42]

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. Former Royal Engineers officer, Captain F.B. Head, one of the most vociferous opponents of Cornish labour, considered them to be insufficiently qualified, while Strasbourg-born Charles Lambert's letter to the Directors of the Chilian Mining Association in London in 1825 noted that he thought 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."[43] Moreover, he relates how a Cornish Mine Captain presented specimens that he thought contained tin ores, such as were found in Cornwall, only to discover that he was in error.[44]

Here Lambert, educated at the École Polytechnique in Paris, where he had acquired an excellent knowledge in the mining, metallurgy and geology, had put his finger on a basic limitation of the Cornish miner. They were beyond doubt, good practical miners, but few had obtained any specific schooling in the principles of geology, physics, engineering or chemistry which would

[42] For example, see Desmond Gregory, *Brute New World: The Rediscovery of Latin America in the Early Nineteenth Century* (London: British Academic Press, 1992).
[43] John Mayo and Simon Collier, *Mining in Chile's Norte Chico* (1998), 15.

have provided them with an underlying theoretical knowledge that would have enabled them to adapt to new circumstances such as were encountered in Latin America.

Moreover, reports of their poor temperament, propensity to insubordination and lawlessness were commented upon on numerous occasions. Former officer and Scotsman, Captain James Vetch, of the Real del Monte Mining Company, Mexico, came to dislike the Cornish intensely and even proposed replacing them by drafting in labourers from Ireland, Scotland and Northern England. In his estimation the Cornish were not the "steady and submissive" workers he had hoped for, but "the most difficult we have to manage…and the most ungrateful."[45] More damning still were the comments of yet another military man, Captain Andrews, of the Chilian and Peruvian Mining Association, who wrote scathingly of the Cornish. As a consequence of their constant squabbling with a group of London labourers and Welsh miners, he too wished to replace them with Germans, whom he considered to be:

> 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.[46]

"The Germans are the first miners in the world," a traveller through Minas Gerais Brazil in 1830 was informed, "and we shall have our mine [near Catas Altas] surveyed by a [German] man who

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[44] Claudio Veliz, "Egaña, Lambert, and the Chilean Mining Associations of 1825," *Hispanic American Historical Review* 55, (1975), 637-663.
[45] A.C. Todd, *The Search for Silver*: *Cornish Miners In Mexico, 1824-1947* (Padstow: Lodenek Press, 1977), 36.
[46] Captain Andrews, *Journey from Buenos Ayres through the Provinces of Cordova, Tucuman and Salta, to Potosi, thence by the Deserts of Caranja to Arica, and subsequently, to Santiago de Chili and Coquimbo, undertaken on behalf of the Chilian and Peruvian Mining Association 1825-26* 2 Vols, (London, 1827), Vol. 1, 209-210. "One and All" is a sarcastic allusion to the motto that appears on the Cornish coat of arms.

can do them justice."[47] German immigrant labour was found in many Latin American mines particularly those of Brazil, where Baron von Eschwege initially mounted a strong challenge to the Cornish in the area of waterwheel technology.[48] The struggle for the right to be considered the best hard rock miners had clearly begun.

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" quoted in the 1842 Children's Employment Commission, often mistaken for insolence. A "character of independence - something American," therefore existed amongst the Cornish population.[49] Used to working largely under their own terms in their native land, in ways handed down from father to son over generations, Cornish miners did not react well to having the hours and nature of their work strictly regulated in the mines of Latin America, and especially not by men who knew little or nothing about mining. Traditionally their own bosses, many were accused of having ideas above their station, an attitude reinforced when they were given jobs supervising Negro slaves and native labour.

The Cornish were initially welcomed in Mexico as heralds of economic rejuvenation and progress, but they 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

[47] *Quarterly Mining Review* (1830), 407-408.
[48] Eschwege, author of *Pluto Brasiliensis*, arrived in Minas Gerais in 1811 and is considered to be the father of Brazilian geology. He was active in both gold and iron ore mining. The Germans also formed a rival enterprise to mine silver in Mexico - the Eberfeld Mining Company.
[49] British Parliamentary Papers, "Report of Commissioners for inquiring into the Employment and Condition of Children in Mines and Manufactories (Report by Charles Barham on the Employment of Children and Young Persons in the Mines of Cornwall and Devonshire. And on the State, Condition, and Treatment of such Children and Young Persons", (1842: 380.), 15/1, 759.

abandoning long-established traditional modes of operating, in this instance the *partido* system.[50] Mexicans customarily chose what area of the mine in which they wanted to work. To the British mine directors and managers alike the *partido* was responsible for a loss in profit to the mines and gave the native miners far too much freedom. As it resulted in a maze of unstable tunnels and galleries, it also militated against mine safety. Regulation of working practises and regimentation of the workforce was therefore required to raise productivity and profit. However, 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 1820s and 30s at the mines of Real del Monte, Zacatecas and Guanajuato upon the abandonment of the *partido*. Troops had to be called in to restore calm at Real del Monte that proved a stark 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. Otis Young notes in his authoritative account of western mining that neither the Saxon or Cornish experts appeared able to convey many of their technical refinements to the Mexicans who seemed content to do things their own way.[51]

A similar scenario occurred in Chile, where, with cheap available labour, time-honoured methods of raising ore were preferred.[52] Indeed, apart from the Cornish miners' habit of fixing

[50] *Tributers* contracted with the mine captain to work a pitch for a previously arranged price. The pitch was an area in the mine that had been previously inspected by the Mine Captain to ascertain its worth. *Tributers* received a proportion of the value of the ores raised. The Mexican system of mining 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 – the *partido* – raised in this way.
[51] Otis Young, *Western Mining: An Informal Account of Precious-Metals Prospecting, Placering, Lode Mining, and Milling on the American Frontier from Spanish Times to 1893* (Norman: University of Oklahoma Press, 1970), 85.
[52] William Jory Henwood, "On the Mining District of Chañarcillo in Chili", *Transactions of the Royal Geological Society of Cornwall*, 8/1 (1871), 169-153.

candles to the brim of their hats when going underground, which was copied by their Chilean counterparts, Mayo stresses that technical diffusion by Cornish miners in Chile was limited, as a report from the *Chilean Times* confirms:

> Steam power had not even been dreamed of then [the 1850s], and even whims, or horse-power drawing machines, were looked upon as costly and probably wasteful innovations, recently introduced by Cornish Mining Captains: what might answer very well in *Inglaterra* they thought might not answer in Chile at all.[53]

By the 1850s doubts were being raised periodically in the *Mining Journal* as to the competence of Cornish miners and geologists, illustrated by the acrimonious correspondence that appeared in 1853 concerning the Veraguas Gold and Silver Mining Company of Panama, whose Cornish workforce was dismissed and replaced with superior miners from Freiberg, Germany, after the Cornish Mine Captain had delivered a report recommending the mine be abandoned, advice that later proved correct. "Inaccurate reports would not trouble the Cornish mine captain, for he is well aware that as soon as the present bubble bursts there is always some scheme afloat in which they can row together," noted a London correspondent with the pseudonym *Fair Play*, one of the many examples of the intention to internationally discredit the Cornish miner. This reveals how keenly contested was the right to be considered the most experienced and accomplished hard rock miners in the emerging international mining labour market.

[53] John Mayo, "Commerce, Credit and Control" (1985), 30-45; John Mayo, *British Merchants and Chilean Development,* (1986), 131.

Assessing the impact of steam technology in Latin American mining

There is little doubt that at the beginning of the mining enterprises in the New World that the Cornish were shown to be out of their depth with unfamiliar and complex ore formations, and the Cousin Jack system of informal recommendation - where Cornishmen were given jobs through nepotism - was open to serious abuse. Yet, much evidence can be marshalled to challenge the adverse reports of Cornish miners' skills, attitude and competency outlined above, for there was much they could offer the redundant mining industry of Latin America, foremost of which was steam technology. Harnessed to unwater workings hundreds of fathoms deep, or to operate machinery that dispensed with animal or human labour, this could result in significant financial savings and revolutionised mining in some Latin American mining fields, but not all. The fuel-hungry engines were not suitable in areas where there was difficulty in obtaining coal, or a shortage of alternative fuel such as timber or peat. Here age-old Iberian techniques persisted, with ores being raised on labourers' backs, unwatering effected by *malacates* and the crushing of ores by *arrastres*.

Mexico provides a classic example, where steam technology was received on its deep and flooded mines with mixed results. At the Bolaños mines, 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.[54] The companies of Tlalpujahua, Anglo-Mexican

[54] *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

and Mexican followed that of Real del Monte in importing steam engines. In fact Dupont maintained that had it not been for steam, the mines of Fresnillo could not have been worked at all.[55] However, after installing steam engines in 1825 at their Guanajuato mines when there was a shortage of mules to work *malacates*, the Anglo-Mexican Company was forced by a lack of good timber and a division of opinion in the company, to become primarily dependent on Mexican methods. [56]

The mines of Cuba utilized steam on a large scale, the engines for the copper mines of the Cobre Mining Company and Royal Santiago Mining Company being cast at Harvey's Foundry, Hayle, and the Fox-Williams Foundry at Perranwell respectively, the coal imported from south Wales. But 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; only one mine in 23 was worked by steam in the 1870s, it being far cheaper to use *apires* (workmen hired to convey ore).[57] When Cornishmen introduced steam engines to Bolivia in the late 1860s they encountered considerable logistical difficulties in obtaining and then transporting sufficient water across the Atacama Desert to maintain the engines' boilers.[58]

In Brazil and Colombia steam technology also made very little impact, as much of the unwatering, stamping and amalgamation was affected through a sophisticated system of waterwheels. However, harnessing the power of water to unwater mine workings and operate surface machinery had also been perfected over centuries in Cornwall, and coexisted with steam

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of Mexico, and although the company was insured, this incident incurred an additional £3,600.[54] 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.

[55] S.C. Dupont, *De la production des métaux précieux au Mexique* (Paris, 1843), 387-8.

[56] Newton R. Gilmore, "British Mining Ventures", (1956), 80. Margaret E. Rankine, "The Mexican Mining Industry" (1992), 29.

[57] Leyland R. Pederson, *The Mining Industry of the Norte Chico, Chile* (Evanston: Northwestern University, 1966), 191-92.

[58] Sharron P. Schwartz, "The Cornish in Latin America" (2003), 159.

engines on many mines in the early nineteenth century. But as Eakin has commented, although water technology was not new (being well known in European mining regions), it was its application by the British "on a rational, large-scale and systematic basis" that was.[59]

The Cornish therefore achieved a very visible presence at the surface of many Latin American mines. The steam engines, some exceeding cylinder sizes of 80 inches, accommodated in their characteristic masonry houses were a very visible sign of British industrial prowess. Moreover, the workmen to erect, install, and thereafter maintain these engines were usually Cornish and with mystagogic zeal they jealously guarded them, arguing that only they had the necessary skills to operate such complex and complicated machines. They also employed the same argument with respect to working underground and in this way created and then perpetuated the myth of their mining genius, kept the best paid, most highly skilled and responsible jobs for themselves, and were thus able to keep out rival ethnic groups, particularly the Germans.

Creating the cult of Cousin Jack

Yet, in the field of amalgamation and smelting of silver ores, the Cornish had little success. The traditional Cornish mode of dressing ores had failed with the silver ores at Real del Monte, Mexico, where they could not improve on the tried and tested *patio* system of silver amalgamation, introduced by the Spanish centuries before. It was not until the introduction of the cyanide treatment of ores by American companies at the beginning of the twentieth century that any significant advances were made in silver ore refining. As noted above, Germans were found in many mining areas of Latin America where they mounted a strong challenge to the Cornish for the right to be considered the best workmen in the mining industry. In Mexico in particular, the Cornish encountered stiff opposition from German refiners and smelters who were experienced in

[59] Marshall Eakin, "The Role of British Capital" (1985), 13.

the metallurgy of silver ores, and who introduced many incremental changes that were "found to be superior to those before practised in Mexico."[60] Germans were engaged in most of the silver concentration departments in Mexico and kept their ethnic rivals the Cornish largely out of this occupation.

However, the Cornish failure with silver ore dressing was somewhat compensated by their 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."[61] At the Aroa copper mines of the Bolívar Mining Company, Cornishmen in the copper ore reduction department made significant advances in the calcination process.[62]

But it was their great experience of deep lode mining, immortalized in the naming of countless shafts, winzes, lodes, adits and cross cuts on Latin American mining plans, and their ability to organise and finance large mining concerns employing hundreds of workmen, which made the Cornish stand out above their ethnic rivals.[63] On arrival in Latin America, the Cornish were faced with what appeared to be a confused and chaotic method of mining very different from the organised concerns with which they were familiar at home. Captain Thomas Garby described as a "miner of judgement and experience" by John Diston Powles, inspected the Valenciana Mine

[60] *Quarterly Mining Review* (1830), 477. This was the verdict of the Real del Monte Mining Company's Director in Mexico.
[61] *Quarterly Mining Review* (1830), 516.
[62] HJ/1/17, Alfred Jenkin Letterbooks, Royal Institution of Cornwall, Truro. Calcining refers to the roasting of ore to remove impurities, particularly arsenic.
[63] For example, the Imperial Brazilian Mining Company's Gongo Soco mine sunk three new shafts in 1839 that were named Bray's, Collins' and Blamey's in succession, according to the seniority of the Cornish mining captains there.

in Mexico in 1824. He found it was not possible to put a barrow through a single level, a shortage of shafts and no method of extending levels or driving adits. In addition there was a lack of mechanisation compounded by the fact that the Mexican miners "work where they can find metal, without any regard to any other circumstance".[64] In fact, Simonin writing in 1869, drew attention to the striking difference between the Cornish miners and the Ibero-Americans:

> The Spanish Americans do little work compared with the Anglo-Saxons…the Cornishmen have not their equals in blasting a vein of quartz, and can earn by the work from ten to fifteen shillings a day, while the earnings of the Spanish, Chilean, or Mexican miners scarcely exceed four to eight shillings.[65]

In 1830 the *Quarterly Mining Review* noted that a Cornish miner could raise three times the quantity of ore of a Mexican *barretero*.[66] "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".[67]

Echoing this sentiment was the mine manager of the Colombian Mining Association. He had introduced the Cornish 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."[68] The Cornish, used to working through the hard granite of their native land, were able mine through rock hundreds of fathoms

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[64] John Diston Powles, *A Letter to Alexander Baring Esq. M.P. on the Subject of Some Observations Reported to Have Been Made by Him in the House of Commons on the 16th March, 1825, in Relation to the Foreign Mining Associations* (London, 1825), 13.
[65] Louis Simonin, *Underground Life of Mines and Miners* (London: *Chapman and Hall,* 1869), 467.
[66] *Quarterly Mining Review* (1830), 458. A *barretero* is a miner who works with crowbar, wedge, or pick.
[67] *Mining Journal*, 22 July 1837.
[68] *Mining Journal*, 22 July 1837.

underground with sophisticated drilling techniques in relative safety, introducing the miner's safety fuse to Latin American mines following its invention and patenting by William Bickford in 1831.[69]

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."[70] His conclusion: "I am afraid that it will never be possible to render you entirely independent of English labour and of home engagement," conveys how important he considered his Cornish workforce to be to the success of his company.[71]

By 1854, following the discovery of gold in California and the development of mines in Australia and elsewhere and with such new enterprises holding out very inviting prospects for would-be workers, it was becoming harder to recruit Cornish miners as the Royal Santiago Mining Company found when it required fresh hands to develop its copper mines in Cuba.[72] It appears that the cult of Cousin Jack, hard rock miner *par excellence*, had begun to take effect. This was a tremendous coup for the Cornish who were not slow to see the global benefits of creating their mythological status in the mines of Latin America and then vigorously promoting this as the international mining labour market expanded.

Latin America: cradle of the developing international mining labour market

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

[69] 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.
[70] *Mining Journal*, 24 June 1837.

companies in Chile (see Table 1) would have prospered.[73] 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 in 1849 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.[74]

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. 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, and Cornish miners were at the cutting edge of this process.

As one of Britain's earliest industrial regions the migration of capital and labour meant that Cornwall began not only to export its skilled workers, but also developed a world class export trade in mining machinery and technology, a process begun by Richard Trevithick in Peru. And it is this development that is crucial to the understanding of the complex relationship that connected Cornwall, Britain and Latin America. Without the initial migration of British capital that resulted in Cornish domination of the boards of directors, mine management and labour structure, it is

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[71] *Mining Journal*, 29 July 1837.
[72] *Mining Journal*, 15 July 1854.
[73] Claudio Veliz, "Egaña, Lambert, and the Chilean Mining Associations of 1825," (1975), 644.
[74] Robert W. Randall, *Real del Monte* (1972), 219. The company still continued to recruit Cornish labour.

doubtful whether the Cornish, although already good practical miners, would have been in such a strong position to dominate the mining labour market as they did. The mines of Latin America acted as a training ground for the Cornish. Janus-like, they were able to look back to traditional mining methods perfected in Cornwall while blending this with unfamiliar mining methods they had encountered in the New World. Indeed, many miners who remained in Cornwall were backward in comparison to the "Cousin Jacks" who ventured overseas. Able to understand and work the most complex mineral bodies anywhere in the world, this hybridized Cornish miner was well placed to respond to changes in the global labour market as the nineteenth century progressed. "Whatever the predilection for foreigners, the English miner has not only held his own against foreigners at home, but has successfully exerted himself in Spain, in Norway, and in various points of Europe" sounded the *Mining Journal* in 1853:

> If the Spaniard began the exploration of the Americas, the Englishmen and his tribe have now carried it out. In our mining districts; Cuba, Jamaica, Mexico, Colombia, California, Brazil, Peru and Chili, are now as familiar as Redruth, Swansea or Alston.[75]

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. Cornwall became a major migration centre for a skilled and mobile work force that gave rise to numerous Cornish transnational communities around the globe by the early twentieth century, where miners 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.[76]

The existence of such enclaves of Britishness became a matter of great importance for the British Empire, as, for example, in the Transvaal in the years leading up to the Anglo-Boer War, where over 25 percent of the white population were Cornish miners.[77] As markets became increasingly interdependent, an integrated labour market emerged in which Cornwall, far from being the peripheral region that it is often thought of as within Britain today, provided the most visible imported workforce from the very beginning of the global mining market in Latin America, and thereafter dominated it. 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.

[75] *Mining Journal*, 4 June 1853.
[76] Herbert Thomas, *Mining Interviews* (Camborne, 1896), 350.
[77] Quoted in Gillian Burke, "The Cornish Diaspora of the Nineteenth Century" (1984), 59.