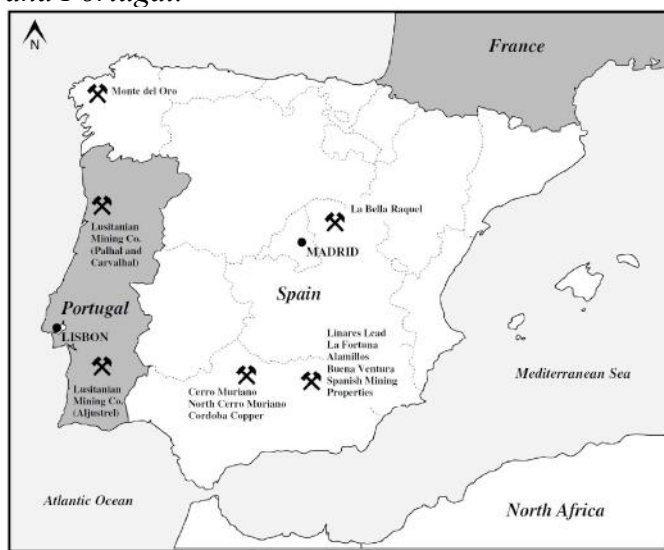


John Taylor and Sons, Mine Promoters and Managers: Seventy Years of Mining in Spain and Portugal

By ROBERT W. VERNON

John Taylor and Sons of London, mining company promoters and mine managers, operated in various parts of the world for about 130 years. The mid-19th century mining activities of John Taylor and Sons (London), were initially centred on

Figure 1: *Iberian Peninsula: The locations of John Taylor and Sons mining operations in Spain and Portugal.*



Source: The author.

England and Wales, but quickly spread to the Iberian Peninsula, where they successfully managed lead and copper mines for nearly 70 years. Figure 1 shows the locations of their mining operations.

British involvement with Spanish mining extends back to the beginning of the 18th century when Lady Maria Teresa Herbert, was involved with a group of 'Adventurers' who attempted to work the Guadalcanal silver mines, and the Rio Tinto pyrites mines in western Andalusia.¹

After an interval of nearly 100 years, there was renewed interest in Spanish mining by British concerns when it was widely reported that the lucrative 'Quicksilver Contract' to work the Almaden mercury mines was awarded to the Rothschild family.² Other newspaper articles in 1843, reported that British survey groups were active in Spain, and were examining mines in the Sierra Morena, the mountain range that runs along the northern border of Andalusia with Castille-La Mancha.

By 1845, a British company had been set up to exploit Spanish copper deposits. The Andalusian Mining Association, was a short lived affair, and as one letter suggests was perhaps mis-managed.³ Despite the company financing an infra-structure for exporting ore back to Britain, it is doubtful that mining operations ever took place.

It is apparent that London financiers had the capital and willingness to invest in the newly established colonies of the British Empire, where good profits could be made.⁴ This change in the financial climate coincided with a relaxation of restrictive legislation brought in at the time of the 'South Sea Bubble'.⁵ The 'Bubble Act' was introduced in 1720 to protect investors, but it had stifled foreign enterprise, and any companies that were formed, could only be established by the granting of a Royal Charter. By 1834 however, this responsibility had been passed on to the British Board

of Trade, and eventually became formalised with the 'Registration Act' of 1844, that required the registration of any joint-stock company with more than 25 partners. The 1855 'Limited Liability Act' overcame the final hurdle for investors and took the responsibility of possible debt away from shareholders.⁶

Spanish mining legislation was also undergoing changes, some of which was designed to bring much-needed foreign investment into the country. Until the mid-1840s mines were under State control, and most mining areas were under-invested and in need of modernisation. The Spanish transport infrastructure was no better. The road system was deteriorating, and a blossoming railway network was focused on Madrid, rather than connected to areas of industry.⁷

All this changed during the reign of Queen Isabel II (1833 to 1868) when in 1849, after various amendments, new mining legislation was introduced. It defined strict procedures for opening a mine. In addition, the new law gave foreigners some protection from reprisals, in case of war, or its causes.⁸ Spanish history up to this point was interspersed with various periods of unrest, which undoubtedly was a deterrent for potential investment. Equally important was a reduction on the import tariffs on machinery. The result was that it was now cost effective to import mining machinery into Spain, for example steam pumping engines.⁹

John Taylor and Sons, were probably taking some financial risk when they registered the La Bella Raquel Company in 1846, to work the Hiendelaencina silver-lead mines, near Madrid, prior to the approval of the new mining legislation. Nevertheless, the mining operation was a success, and it soon became apparent to others that Spanish mining opportunities existed. In 1849, the Linares Lead Mining Association was formed to work the Pozo Ancho mine to the north of Linares, Jaén in northern Andalucía, and by 1853 John Taylor and Sons had been appointed managers. They quickly made the mine more efficient and profitable, and the Company became a limited liability company listed on the London Stock Market.¹⁰

This was the first of several profitable Taylor's ventures at Linares (e.g. Fortuna, Alamillos). In 1898 the Linares Lead Mining Company had declared its 100th dividend, a unique achievement. Other Spanish mines were also 'tried', for example Monte del Oro, Galicia, but they were not successful.

In the first decade of the 1900s, the Taylors, after a brief phase of modernisation, reduced their operations at Linares, and sought new initiatives that included the Cerro Muriano Mines Company (1903), formed to work copper mines near Córdoba, Andalucía. It was restructured in 1908 as the Cordoba Copper Company, and operated profitably until 1919. In 1924, the company was again restructured to become the Indian Copper Corporation to work copper deposits in India. These reserves had been previously explored by the Cape Copper Company, another of Taylor's enterprises that was based in South Africa.

In Portugal, the Taylors managed the Lusitanian Mining Company to work copper/pyrites mines, south of Lisbon, and lead and copper mines near Porto. The company was registered in 1854 and ceased operations in 1880.

Prior to 1850, Spanish mines were relatively shallow, generally less than 120m deep, and were generally worked down to the water table, or to a point where the

quantity of water raised in leather buckets became so excessive that it made the workings uneconomical. John Taylor and Sons introduced steam pumping technology to the majority of their Spanish mining operations. This innovative mining technology, at least from a Spanish perspective, and encouraged by the reduction on import tariffs, was soon taken up by the indigenous mining companies. Mining fields like La Carolina and Linares expanded rapidly, and lead mining became the dominant industry in those areas.

In the case of Linares, remnants of this success still survive in the town, for example the well-maintained English cemetery established on land originally bought by John Taylor and Sons. But most of all the legacy of John Taylor and Sons can be found in the mining landscape - for example, there are several shafts that bear the name Taylor, and other shafts are named after Directors of the Taylor's lead mining operations. It is however, the surviving mine structures, principally the steam engine houses, found on all of the Taylor's mining operations that have made a significant contribution to one of the most important mining landscapes in western Europe. This together with other aspects of John Taylor and Sons mining operations will be briefly addressed in this paper.

John Taylor Senior

John Taylor was born in Norfolk, England in 1749 and eventually trained as a land surveyor and civil engineer. At the age of 19, he was appointed mine manager of Wheal Friendship mine, near Tavistock, Devon. He rapidly gained a good reputation by introducing mechanised ore dressing, and improving the shipping arrangements.¹¹

In 1812 he left Devon, and after a brief interlude in London, became mine agent to the Grosvenor family, later to become the Dukes of Westminster, who operated a significant group of lead mines in Flintshire, north-east Wales. Some ten years later he set up the family home in north Wales, at Coed du, Rhydymwyn, and established an ironworks and foundry to supply and service mining equipment.¹² Taylor's reputation grew and in 1818 he gained an additional appointment when the Duke of Devonshire made him agent for his lead mines on Grassington Moor, Yorkshire, and the Ecton Copper Mine, Staffordshire. The same year saw him form his first Mining Company, the Consolidated Mines at Gwennap, Cornwall. Other companies followed and John Taylor acquired considerable mining experience, coupled with a run of success.¹³

However, not all his ventures were successful. His first attempt at mining abroad, the Real del Monte silver mines, Mexico, failed with heavy financial losses. This episode in Taylor's life has been well documented by Randall (1972), whilst Todd (1977) describes the mining operations from a Cornish perspective, in detail.¹⁴

Briefly, in 1823, Taylor was approached with a proposal to work mines in Mexico. Taylor clearly liked the idea and the Real del Monte Company was formed, but virtually from the onset there were legal complications regarding the rights to work the rich silver mines in the Bolaños district. However, a considerable amount of money was invested in the enterprise in both man-power and machinery, and although there were some minor successes, the operation eventually failed, possibly due to weak management. 'Perhaps the most serious fault in the firm's management was the refusal

on the part of the London administrators to grant much discretionary authority to the head of the establishment in Mexico'. Other factors that led to the demise of the operation included costly mining decisions that gave back little in return, leading to the winding up of the company in 1849.¹⁵

The Real del Monte episode must have been valuable experience for Taylor, and it may have given him an insight into Spanish practices and etiquette! Eventually, John Taylor, together with his sons, John and Richard, would successfully manage mines worldwide. In Spain and Portugal they established mining operations in seven areas, and the majority were a success.

John Taylor and Sons

The marriage of John Taylor senior to Ann Pring in 1805 produced two sons, John and Richard.¹⁶ After a formal education both sons gained practical experience in mining by visiting some of the classic European mining regions such as the Harz Mountains, Germany.¹⁷

On their return to England, John Taylor gradually made his sons responsible for different mining areas. John had responsibility for Wales and northern England, whilst Richard took on duties in South-west England, and eventually became the mineral agent for the Duchy of Cornwall. By 1851, both sons had joined their father in London and the partnership of John Taylor and Sons was born.¹⁸ Initially, they confined most of their efforts to Great Britain, but gradually extended their interests into Europe. No doubt John Taylor was cautious because of his experiences in Mexico, but in 1846 he formed the La Bella Raquel Company, to work the Spanish silver-lead mines at Hiendelaencina. It was John Taylor's first major venture in Spain.¹⁹

Hiendelaencina lies in the southern foothills of the Sierra de Guadarrama about 100 km to the east of Madrid. It is an open bleak landscape, with a scattering of mines. Silver had been discovered at the Santa Catalina mine, two years previously. This fact is commemorated by several monuments, and examples of more recent mining operations can be seen adjacent to the town.

A mine section gives some indication of Taylor's mining operations. The workings were centred on the *Filon Rico* (Rich Vein) at the Santa Catalina Shaft. The lateral extent of the workings are shown, with one area shown as having been worked between 1844 and 1871. This is almost certainly the portion of the vein worked by the La Bella Raquel Company.²⁰ In addition, a pumping engine was installed on the San Carlos shaft and the engine house still survives, and may be the oldest Cornish type engine house in Spain (See Figure 2).

By 1847, Taylors had built a large smelting plant, named La Constante, sited to the north-east of the town in a steep gorge.²¹ It also seems likely that Taylors may have operated other mines in the area to maintain output, but nevertheless the Bella Raquel Company ceased operations in 1878.²² A Spanish company then took over the running of the Constante smelter, the substantial ruins of which survive, albeit on private property.

Figure 2: *Hiendelaencina: A Cornish type pumping engine house still survives on the San Carlos shaft. It probably housed a 30 inch engine and was installed by the La Bella Raquel Company in the later 1840s.*



Source: The author.

It would seem that John Taylor, who at this time was in his 70s, gave the responsibility of managing the partnership's European operations to his sons. John was predominantly involved with Spain and Portugal, whilst Richard had responsibility for the Pontgibaud lead mines, France. At this time, the partnership was also becoming involved with other mining areas, mainly in Central America, Canada, and West Africa.²³

1849: Linares, Spain

In southern Spain, Duncan Shaw a Scottish engineer living in Córdoba, set up the Guadalcanal Silver Mining Association in 1848, to work the famous silver mines of the same name, that lie to the north of Seville.²⁴ It was an unsuccessful venture so he turned his attention to the Linares area to the east, and formed the Linares Lead Mining Association to work the Descuidada 3 and 4 concessions at the Pozo Ancho mine just to the north of the town.²⁵

Pozo Ancho had been abandoned by its Spanish owners some six years earlier, because it had become uneconomical to work. Not only were there about 15 fathoms of old Roman workings to penetrate to reach the virgin vein, the water table was soon encountered below the old workings. The Spanish had drained the workings with a workforce of 192 men. They carried the water out of the 50 fathom level in leather sacks up ladders to the 30 fathom level.²⁶ From the 30 fathom level the sacks were raised to the surface by a mule whim. This was probably a 'Malacate de Rosario' where the sacks would be attached to hooks on a constantly moving rope. However, it was the miners asking for a pay rise that eventually made the mine uneconomical. On acquiring the concessions, Duncan Shaw instantly solved the drainage problem by installing a 30 inch Cornish type pumping engine, the house of which still survives.²⁷

In the first few years of operating Pozo Ancho, there were a few major problems to overcome. It was possible to get a better price for lead ore by exporting it to England

but there was no railway connection between Linares and the ports of Malaga and Seville. Everything had to be moved by donkey, mule or ox-cart. To expedite ore movement stockyards were established at Bailén and Córdoba. The mine quickly ascended to the enviable position of producing more ore than could be physically transported from the mine.²⁸

By late 1852, Linares Lead had become a registered Company and the Directors turned to John Taylor and Sons for advice to make their mining operations, and transportation, more efficient. Over a 12 month period, on the strength of rumour, and eventually Taylor's actual employment, the share price rose from about £4 to around £15.²⁹ By 1856, Linares Lead had been re-registered as a Company with limited liability, totally managed by John Taylor and Sons.³⁰

1854: Portugal

During 1854, John Taylor and Sons embarked on their only venture into Portugal and floated the Lusitanian Mining Company³¹ (Lusitania being the old Roman Province that equated to most of modern Portugal). Initially their operations were confined to the ancient pyritic copper mine at Aljustrel. This endeavour was not a success, and after only two years, they moved their operations to the area between Lisbon and Oporto to work the Palhal and Carvalhal lead and copper mines. Both mines were worked successfully until 1880, when the company was wound up.³²

It is possible that their short-lived attempt to work Aljustrel soured their image of the mining potential of the Iberian pyrite belt. This lucrative market was eventually successfully exploited by a succession of British companies that included Mason and Barry (San Domingos mine, Portugal - formed 1858), Tharsis Sulphur and Copper Company (Tharsis and La Zarza mines, Spain - 1866), and Rio Tinto (Spain -1873).³³ As far as is known, John Taylor and Sons never had any involvement with any of those firms, or any other company working the Iberian pyrite belt.

1850s - 1860s: Linares. A period of expansion.

John Taylor and Son's success in Spain was founded on the introduction of steam technology, something the indigenous mining companies soon adopted. Initially, the Taylors bought from the traditional engine manufacturers, usually Cornish, but eventually, equipment was provided by Taylor's own foundry at Sandycroft, North Wales.³⁴

Further concessions had been acquired by the Linares Lead Company by 1855. In addition, the potential of the Linares lead mining area was becoming fully realized, so much so that the Taylors decided to lease even more concessions and set up another company, La Fortuna, to work them.³⁵ The concessions grouped as Cañada Incosa, lay a short distance to the south-west of Pozo Ancho. Steam pumping technology was essential and the engine house also survives along with other structures.

The process was repeated in 1862. A further group of concessions, Los Salidos, was added to La Fortuna. That year also saw the formation of a third company

Alamillos, taking up a group of partly disjointed concessions located between the Linares Lead and the Fortuna Companies operations.³⁶

On the Alamillos concessions pumping was carried out by three engines. A horizontal pumping engine was installed at the southern end of the vein at Crosby's shaft (Figure 3), whilst a traditional Cornish engine on Taylor's Shaft pumped the central area (Figure 4). The third engine was located at the north-east end of the vein at Alamillos Altos.

Figure 3: *Alamillos mine: The house for the horizontal engine that pumped Crosby's shaft. The rectangular opening, now walled in, was for the line of horizontal flat-rods that operated the pump rods in the shaft. Horizontal pumping engines were relatively rare in the Linares area.*



Source: The author.

The idea of smelting the lead ore *in situ* had been a regular consideration and a small smelting plant had initially been constructed at Pozo Ancho. One major problem was getting the right balance between the fuel supply needed for smelting, and that for firing steam boilers. In the early days of the Company locally sourced wood was the principal fuel together with some poor quality Spanish coal brought in from adjacent coalfields.³⁷

However, by the 1860s, railway links had reached Linares from Seville and coal was becoming more plentiful. Good quality coal was also being imported from Britain. The Taylors decided that as a railway line had also been constructed from the Belmez Coalfield to Córdoba, then a new smelting plant should be constructed at Córdoba to smelt ore from the Pozo Ancho and the Alamillos mines. Córdoba is located nearly half-way between Linares and the port of Seville. In addition, a small smelter constructed at La Fortuna mine had the capacity to be extended if difficulties arose at the Córdoba smelter.³⁸

In 1855 the Linares Lead and La Fortuna companies bought a piece of land to establish a cemetery on the outskirts of Linares. This was ultimately consecrated by the

Bishop of Gibraltar in 1866.³⁹ A cemetery was also established at Córdoba, and was sited within the curtilage of the new lead smelting works. The origins of the people buried at the Linares cemetery show a mix of Cornish / Devon names as well as from elsewhere in Britain.⁴⁰ They even include a distant relation of the actress Helena Bonham-Carter, Reginald, who was a mechanical engineer and tragically killed in 1906 when he fell down an underground shaft.⁴¹

Figure 4: *Alamillos mine: Cornish type engine house on Taylor's shaft. Taylor's name was frequently used to name shafts on many of the mines they owned or managed.*



Source: The author.

By 1870, ore reserves were dwindling at the Pozo Ancho mine, and the Taylors had acquired more concessions for the Linares Lead Company, to the north of the La Fortuna workings; Los Quinientos mine.⁴²

All three of the Taylor's mining companies were now announcing at least two good dividends a year. This inspired one editor to christen the mines as 'Three Drops of Comfort'.⁴³ Success can only be built on, so in 1878 a fourth company was floated to work concessions to the north-west of La Fortuna; the Buena Ventura Company.⁴⁴ Mining conditions at Buena Ventura however, were difficult. Output was variable and it was not a very profitable venture, so the company was wound up in 1890.

John Taylor senior had died in 1863, long enough to see the success of his Linares operations crystallise.⁴⁵ His sons John (Jnr) and Richard died 18 and 20 years later, respectively. In John Taylor junior's obituary it was stated that, 'The public learned to rely greatly upon him, and so it came to pass that the name of John Taylor and Sons upon the face of a prospectus went a long way towards the successful floating of a new enterprise.' It was now left to his son, John Taylor III, and other family members, to live up to this reputation.⁴⁶

The 1880s can be regarded as a transition period for John Taylor and Sons, as they concentrated much of their efforts in the expanding markets of India, and Australasia. They formed for example three significant, and ultimately profitable companies, The Mysore, Ooregum and Nundydroog, and later the Champion Reef, to

work the Kolar goldfields, India. They were followed by a succession of other companies, until ultimately John Taylor and Son's had control of virtually the whole goldfield. Much of this success can be attributed to the efforts of the son of John Taylor junior, referred to as John Taylor III.⁴⁷

1886: Monte del Oro, Galicia

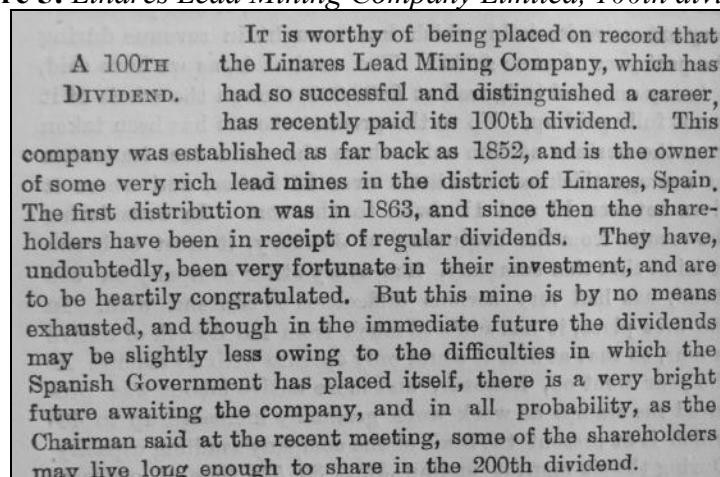
It is unclear what promoted John Taylor and Sons to embark on their next venture, a gold mine in Galicia, north-west Spain. The Monte del Oro Mining Company Limited was registered on the 22nd October 1886 with a nominal capital of £75,000 in £1 shares. Not wishing to expend large amounts of money on equipment, the prospecting was confined to a series of shallow levels driven by miners from the Alamillos mine. However, after exploring the mine for six years the venture failed.⁴⁸

Whilst the shareholders made little from Monte del Oro, Taylor's did at least cover their expenses. Their services as managers were set in stone, in the Monte del Oro Company's Articles of Association. As managers they would be paid £400 per annum, plus £200 for other salaries etc., and a further £200 for providing a Company Secretary. In addition they would be paid any extraneous expenses, as well as £750 for forming the company and acquiring concessions. They would also receive a further commission if the mine was a success.⁴⁹

1898: Linares. A remarkable achievement followed by decline

All three of the Linares Companies continued generating wealth throughout the 1880s and 1890s, and during 1898 a significant milestone was reached for the Linares Lead Mining Company as the 100th share dividend was announced. As the Chairman of the AGM declared 'A centenary of runs in a cricket match may be a common occurrence, but a centenary of dividends in a mining company is not a frequent experience'.

Figure 5: *Linares Lead Mining Company Limited, 100th dividend.*



A 100TH DIVIDEND. It is worthy of being placed on record that the Linares Lead Mining Company, which has had so successful and distinguished a career, has recently paid its 100th dividend. This company was established as far back as 1852, and is the owner of some very rich lead mines in the district of Linares, Spain. The first distribution was in 1863, and since then the shareholders have been in receipt of regular dividends. They have, undoubtedly, been very fortunate in their investment, and are to be heartily congratulated. But this mine is by no means exhausted, and though in the immediate future the dividends may be slightly less owing to the difficulties in which the Spanish Government has placed itself, there is a very bright future awaiting the company, and in all probability, as the Chairman said at the recent meeting, some of the shareholders may live long enough to share in the 200th dividend.

Source: 'A 100th Dividend', *Mining Journal*, London, 1898, p. 1120.

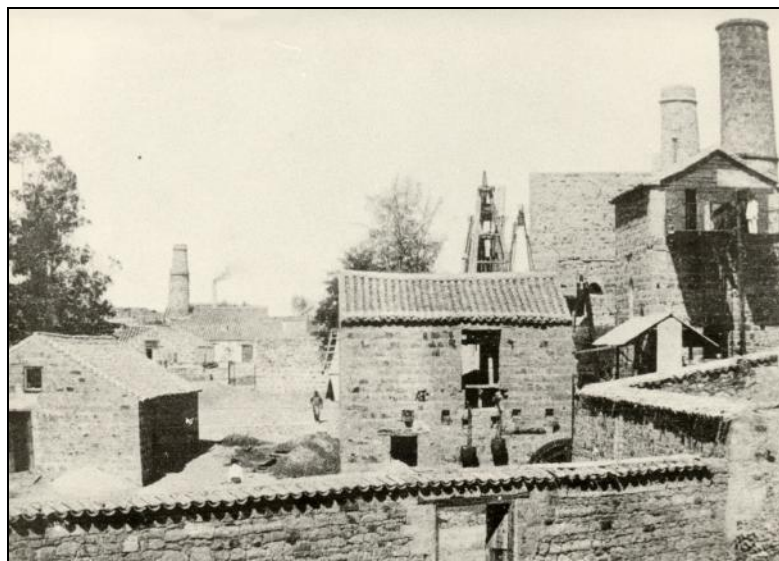
The author knows of no other 19th century lead mining company that issued 100 dividends, yet alone in what were turbulent times for the industry, and would be quite

happy to be proved wrong.⁵⁰ Figure 5, a paragraph from the *Mining Journal (London)* also recognised the significance of the event.⁵¹

However, all this success was having some effect on ore reserves. In the Linares area, the veins become impoverished at depth, and this was starting to become a major concern for the mine managers. At La Fortuna, for example the reserves were rapidly being depleted and the Company had started to explore adjacent mines (San Anton and El Clarin). Their efforts however, were insufficient to increase output and so the Fortuna Company took the unprecedented steps of exploring two mining concessions, Santa Leocadia and Constancia, some distance away at Posadas to the west of Córdoba. Once again it was found that the Romans had worked the veins quite extensively to a depth of 200ft. The country rock was shale which was weak in comparison to the strong granite of the Linares mining field. Considerable effort was required to get under the Roman workings, but to no avail and this attempt was abandoned in 1901.⁵²

In 1900, a further venture was also being explored by Taylors, to the north-west of Linares, at La Carolina. A new company was formed, Spanish Mining Properties, but again it was found that the ground was not as kind as the Linares granite, and the venture failed after 3 years.⁵³

Figure 6: *The Pozo Ancho Mine, Linares Lead Mining Company Limited: A postcard view dated about 1900. The pumping engine house and headframe on San Tomas shaft, is in the background. The whim engine (middle, right), which had seen nearly 50 years service, also operated the roller crusher (middle).*



Source: Colectivo Proyecto Arrayanes, Linares.

Two other important factors affecting production was the age of the machinery, and the workings were getting deeper, which meant it was gradually taking longer to hoist ore out of the mine. At Pozo Ancho mine for example, the pumping and winding engines, which also worked the roller crushers, were becoming obsolete after some 50 years of work, and ore was being hauled up the shaft in kibbles. Figure 6 shows Pozo Ancho Mine in about 1900. Both engine houses are clearly visible, as well as the crusher house.

Whilst John Taylor III seems to have been responsible for the bulk of the Indian mining operations, it appears that the other responsibilities of John Taylor and Sons was divided up between the other brothers, Edgar, Frank and Robert. At this time, considerable effort was also being made to promote the families other business interest, the Sandycroft Foundry located in north Wales, as well as their British mining interests in England and Wales. Perhaps it was due to complacency, built on continuing profits, but the partnerships mines in Spain and France continued with little new investment, or modernisation. It prompted one commentator in 1903 to remark at the appointment of Ernest Woakes as manager for the Taylors operations in Linares, 'His job is rather a rotten one, for the Taylor's have neglected their mines here for a long time, and now send him to try to mend matters, but with hardly any money to do it'.⁵⁴

Carmichael, a friend of Woakes, makes a similar observation in 1905 and mentions that a large number of mines in the Linares mining field had closed having exhausted their known ore bodies.⁵⁵ The heydays of healthy profits were clearly waning, and perhaps in some quarters the dealing in shares had taken precedent over actual mining, although this certainly wasn't the case for the remaining British companies. In 1903, John Taylor III retired and his Spanish responsibilities were taken on by Henry Claude Taylor. Henry made a visit to Linares with William Frecheville, a mining engineer of note. A decision was made to explore the veins at depth and introduce compressed-air powered rock-drills, and replace the old kibles with a double cage or skip-winding system. At Pozo Ancho, it was also decided to concentrate production at the southern pumping shaft. Piell's, where the mineralisation was considered to extend to a greater depth.

The houses for the winding engine and compressors bearing the date 1904 are a testament to these modifications, but despite the workings in Piell's shaft eventually extending down to 320 fathoms, the vein became impoverished and there was little to show for their efforts.⁵⁶ Figure 7 shows Piell's shaft with the housing for the new winding engine and boilers.

Thus the first decade of the 20th century was a period of decline for John Taylor and Son's operations at Linares. New sources, Broken Hill for example, were flooding the markets with lead, and the market value for lead ore was fluctuating considerably, but generally falling. At Linares, no new significant reserves had been discovered. In addition, there were problems with the coal supply. An unwelcome complication was that the Spanish government had increased taxes on mining operations.⁵⁷

There were however, other small sources of income in the Linares area. It is apparent that as mining engineers the staff of John Taylor and Sons also provided a local consultancy service. This is one example. When Reginald Bonham-Carter was killed in a mining accident, the mine captain for the Linares Lead Mining Company was called upon to value the Abundancia mine that Reginald owned. Correspondence indicates that just to undertake the work Taylor's charged £200, and any other expenses incurred would be extra. Should the Taylor's report be used to sell the mine then Taylor's would expect a further fee of £250.⁵⁸

Figure 7: Piell's shaft, Pozo Ancho mine, Linares Lead Mining Company Limited: The Cornish type pumping engine house together the new headframe and winding engine house installed in 1904.



Source: Colectivo Proyecto Arrayanes, Linares.

Despite trying to maintain output, and even increasing ore output for some years at the Linares mines, profits were falling, and for the first time in its history, the Linares Lead Mining Company made a loss. The other Taylor's mines were also modernised, but fared no better. By the end of 1910, all Taylor's workings at Linares had ceased and remaining concessions of the Fortuna Company were sold for £7,500.⁵⁹

The Linares Lead Company went through a number of changes shortly after being modernised. In 1906 it was restructured and three more members of the Taylor family became involved with its management.⁶⁰ Henry, Robert and John (IV) Taylor took turns in being the Company Chairman. By 1909 the assets of the adjacent Alamillos mine, which had been restructured earlier that decade, were absorbed into the Linares Lead Mining Company, and the Alamillos Company was wound up. Still profits were negligible and both the Quinientos and Pozo Ancho Mines were eventually sold in 1911 to Spanish concerns for a total of £11,463.⁶¹

However, all was not quite over for either the Fortuna, or the Linares Lead Mining Company. Both Companies explored several prospects in the borders of the provinces of Córdoba and Extremadura. Eventually they settled on the town Azuaga, located in the heart of a well-established lead mining field. The Linares Lead Company worked the Engracia concession adjacent to the town and castle.⁶²

None of these operations were really successful. Fortuna had concentrated on exploring three concessions at Azuaga and was eventually wound up in 1914.⁶³ The Linares Lead Mining Company, first examined a lead mine at Hornachos, that had been worked by several British companies in the 19th century, before moving to Azuaga.

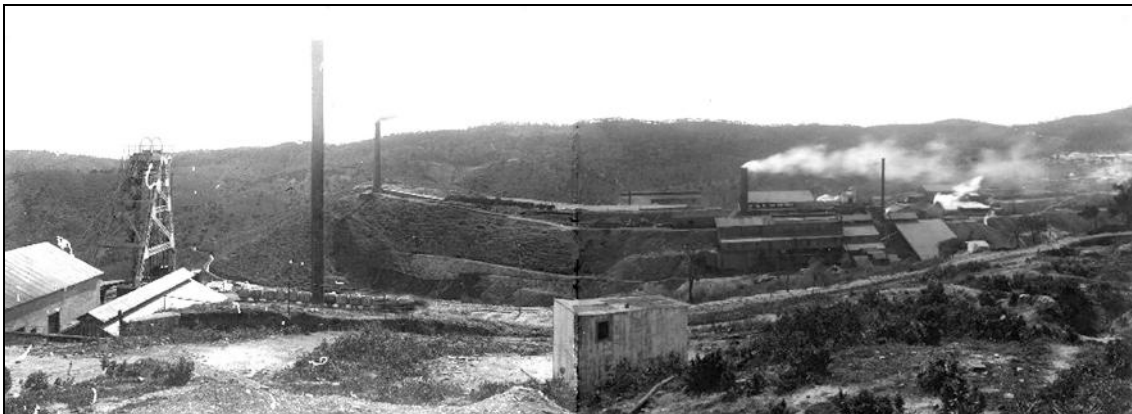
But eventually, the Company shared the same fate as Fortuna and was wound up in 1917.⁶⁴

But this isn't the end of the story for John Taylor and Sons, they were also operating a copper mine at Cerro Muriano, just to the north of Córdoba.

Cerro Muriano

The Cerro Muriano mine was well known in antiquity and had been exploited by the Romans to a depth of 600ft (183m). It was re-opened in 1900 by the Cordova Exploration Company, who had got local entrepreneurs interested in its potential, including the British Vice-Consol, Richard Carr.⁶⁵ More capital was needed to work the mine efficiently and so probably as a result of Carr's efforts, The Cerro Muriano Mining Company was formed in 1903 with John Taylor and Sons the managers. This included Messrs. Frank, Robert, Edgar, Henry Claude and Arthur Taylor.⁶⁶ A total of 27 concessions were ultimately taken up by the company, the main vein occupying the central area.⁶⁷

Figure 8: *Cordoba Copper Company, Cerro Muriano, Córdoba: The mill complex and smelting works together with the headframe on East shaft (left).*



Source: Martin Pierce.

In order to explore the most northerly veins, a sister Company, the North Cerro Muriano Mining Company, was established in 1906, and took over the northern group of concessions.⁶⁸ Having established the extent of the workings and reserves both Companies were wound up and reformed as the Cordoba Copper Company in 1908.⁶⁹ After a short run of moderate success during World War I, the company was sold in 1919 to a Spanish concern. Taylors took all the capital raised to India and re-formed the Company as the Indian Copper Corporation.⁷⁰

Adjacent to the Cerro Muriano mine, there was a large mill complex and smelting plant (Figure 8). The purpose-built settlement for the workforce lay to the south of the smelter. There were three main shafts on the Cerro Muriano Vein - Victoria, San Rafael and East. San Rafael was the main pumping shaft pumped by a large vertical compound condensing pumping engine bought in 1904 from Hathorn Davey, of Leeds, England. It was one of a small number of engines built to this specification. The total cost of the engine and pumps for Cerro Muriano was £5,525. A

good investment as the engine served the mine throughout its life.⁷¹ The engine house and the mill are still evident on the ground, the latter being a protected monument.

Epilogue

Whilst the Cerro Muriano mine was the last Taylor's mining operation in Spain, it was by no means their last worldwide. Since the 1880s, India had been a major focus for the company, so to invest the money from the sale of Cerro Muriano into Indian mining was not wild speculation. They had a considerable colonial presence there that had started with the formation of the Mysore Gold Mining Company, to work gold mines in the Kolar Goldfield, 70 kms east of Bangalore, India.⁷²

Australasian mining was an area that interested them, but being there put them in direct competition with their rivals, for example Bewick Moreing, who had a strong presence in both Australia and New Zealand. Despite Taylors making several attempts to manage mines in the Victorian goldfields, none came to much. There were, however, other challenges, one example being the Tasmania Gold Mining Company, at Beaconsfield, Tasmania.⁷³ The mine, under their management, had experienced several serious inundations and the quantities of water were impeding progress. Taylor's prescribed a very expensive solution, the installation of three Hathorn Davey horizontal compound pumping engines with a contract value of £48,784.⁷⁴ It is perhaps not unusual that Taylor's recommended the very robust Hathorn Davey engines as they had also purchased similar engines for their operations in India.

The 1911 *Mining Year Book*, lists four of the Taylor family involved with mining on most continents, Robert (Director of 19 companies), John (20), Henry Claude (7) and Edgar (10). The latter was also president of the Institution of Mining and Metallurgy.⁷⁵ Robert, the senior partner in the business received a knighthood in 1920, in recognition of his responsible position, and as Director of the Mysore Gold Mining Company.⁷⁶

Twenty-one years later, things had changed considerably, only two members of the family, Henry Claude and Edgard Edgar were listed as Directors of seven Indian gold mining companies.⁷⁷ The reducing number of family members meant that the firm of John Taylor and Sons had to take in non-family, professional mining engineers, as partners, for example, Thomas Pryor, who came from a family of Cornish mining engineers, and Robert Nye who was made a partner in 1942.⁷⁸ Whilst much of their work was now centred on India, the partnership was occasionally involved with other continents, for example the flotation of the South African Torbonite Mining and Refining Company in 1934.⁷⁹

The World War II bombing of their long established offices, at 5 and 6 Queen Street Place, London, in 1941, must have been a great loss to John Taylor and Sons. It prompted one shareholder of the Mysore Gold Mining Company to remark,

It was with great sorrow that we heard that our managers, Messrs. John Taylor and Sons, had lost through enemy action, their old historic building; but I have no doubt that honey will continue to flow to the stockholders from a new hive, and that things will go on well again.⁸⁰

John Taylor and Sons had had a considerable colonial presence in India that started in 1880, where they had a track record of sound investment particularly in the Kolar Goldfield. The granting of Indian Independence in 1947, marked the beginning of the end. Eventually, in 1956, the Kolar gold mines were nationalised, and the Taylors involvement as significant mine owners ceased.⁸¹ In India today, the remnants of the Indian Copper Corporation still survives as part of the Indian Government owned Hindustan Copper Ltd.⁸²

John Taylor and Sons successfully operated their business for over 130 years, through five generations of the same family. They were associated with Spanish mining for 70 of those years. In London in 1969, with two members of the family, Sydney and Arthur still functioning as partners, they finally closed their doors.⁸³

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