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Last but not least, a big thank you to my wife, Margaret Vernon for her assistance in collecting the information and helping with the translation.

Dedication

This monograph is dedicated to my granddaughter Hazel Winifred Vernon. Perhaps one day she will also be inspired to write about her own research.

INTRODUCTION

'From morning until night you hear nothing, see nothing but lead: lead at the railway station, lead-smoke (from the smelting works) in the air, lead on the donkeys' backs: plomo en gahipagos, plomo en plancha, plomo primero o segundo (lead in pigs, in sheets, lead of the first or second quality). Lead and money, varied by money and lead, it is depressing alike to soul and body; and, gentle reader, remember there is a proverb among us, "Andar con pies de plomo" (to proceed with leaden feet); and a disease among us which is called "being leaded," and makes a man's eye dull and his brain sleepy.' So wrote the Reverend Hugh James Rose, Chaplain to the English, French and German Mining Companies of Linares in 1875 in his very descriptive work about his time there.¹

The metal mines scattered around the towns of Linares and La Carolina were once recognised as some of the world's major lead producers. From the mid-19th to the beginning of the 20th centuries the larger mines were generating consistent outputs and profits, even when lead was at its lowest value on the world's metal markets. The concession of the Spanish state-run Arrayanes mine dominated the area but close behind followed a string of British companies, notably the Linares Lead Mining Company founded in 1849 and later managed by John Taylor and Sons, the internationally renowned firm of mining consultants based in London. Other successful British Companies were soon to follow, that included Fortuna and Alamillos, also formed and managed by the Taylors.^{2,3,4}

In comparison, the Spanish Lead Company Limited was late on the scene. Established in 1864 and managed by Thomas Sopwith jnr., it was a private company financed by landowners and industrialists from the North of England as well as the City of London, that was formed to work the La Tortilla Mine to the west of Linares. The Company soon gained a reputation as a major lead producer. The Company was reformed, and refinanced, as T. Sopwith and Company Limited, in 1880, a move that led to the construction of substantial lead-works at La Tortilla. In the early 1900s, mining operations ceased and the smelting-works were taken over by the Peñarroya group. Notably, the name Sopwith was still associated with La Tortilla when the Compañia Sopwith operated the smelt works in the 1950s.⁴

Figure 2 is the only known photograph of Thomas Sopwith jnr. and was probably taken before his death in 1898.

Being a private limited company, very few original mining records survive for the years when Thomas Sopwith jnr., or Tom as he was referred to, was the manager and later director of La Tortilla. We are fortunate, however, that two contemporary accounts exist in the United Kingdom that describe the Sopwith years there. The first source, which charts the rise of the Company, are the diaries of Tom's father, Thomas Sopwith snr., who strongly supported his son's endeavours at Linares. Sources for the diaries include photocopies with the Colectivo proyecto arrayanes, Linares, Spain (1862 to 1868), microfilm at the Northumberland Record Office, Woodhorn, Northumberland (1868 to

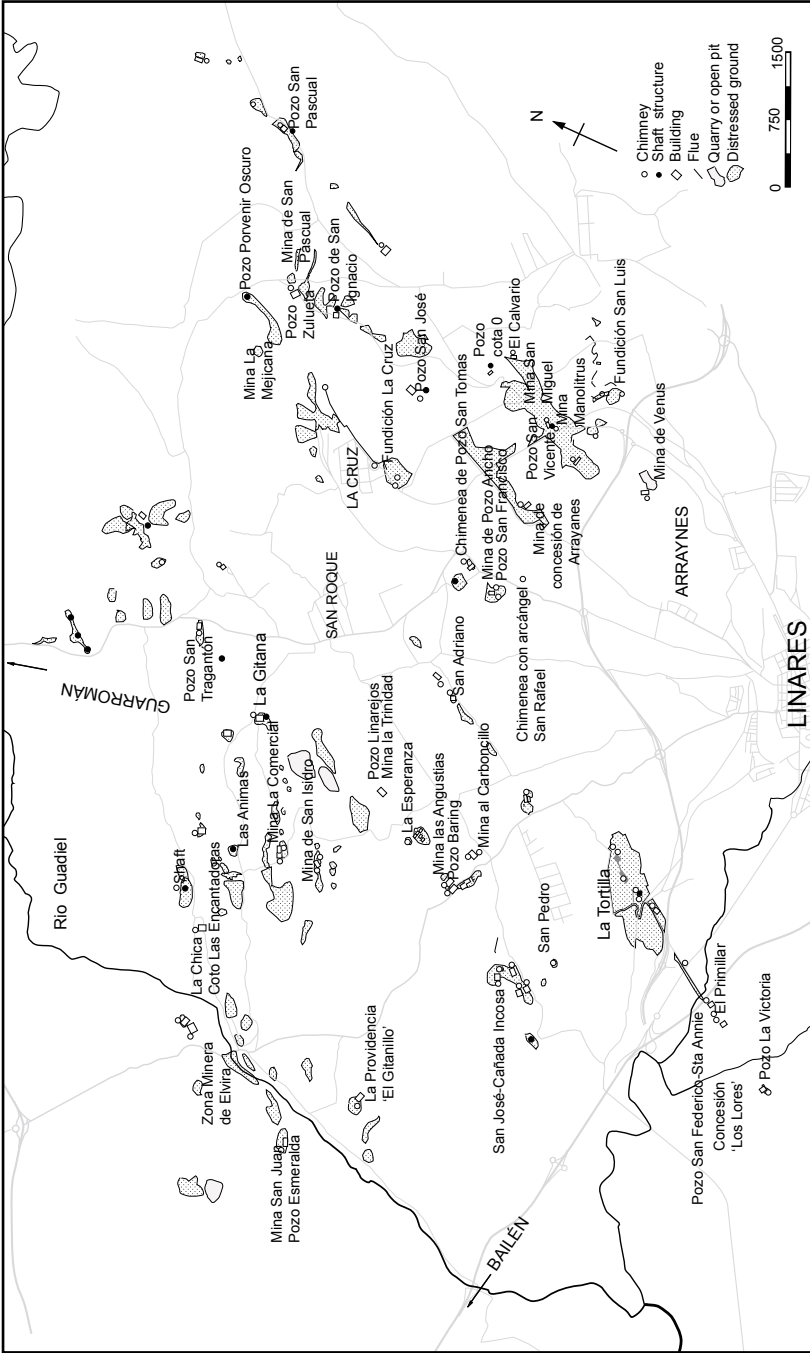


Figure 1. Sketch of the area around, showing chimneys, shaft buildings and other features identifiable from Google Earth. The Pozo Ancho mine, just to the north of Linares, operated by the Linares Lead Mining Company, has some of the oldest engine houses in the area. The first one was built in 1849. The Spanish Lead Company, who worked La Tortilla, was a relative newcomer to the area.

1878) and references in Richardson's biography of Thomas Sopwith snr.⁵ The second source, are the letters of a British mechanical engineer, Reginald Bonham-Carter, who fell in love with Linares and its people. He was tragically killed in a mining accident there in 1906 and is buried in the English cemetery on the outskirts of Linares. Reginald wrote a letter to his mother virtually once a week while he lived in Spain and it is in his writing that we witness the decline of the Sopwith Company. The letters (1894 to 1906) are held in the Hampshire Record Office, Winchester, Hampshire. There are other sources of information as well. They describe the technical processes at the mine and lead-works and they will be referred to in the text but they do not compare with the first-hand experiences described in the diaries and letters.

Today the ruins of the La Tortilla lead mine and smelter, together with many other similar remains, dominate the landscape to the north and west of Linares (see Figure 1) and serve as a reminder that the wealth of Linares was once generated by a thriving mining industry. La Tortilla, and associated mines in this extensive enterprise, stand as monuments to the endeavours of one man, Thomas Sopwith jnr. and this is his story. Although there have been many changes to the sites since production ceased, the remaining structures at La Tortilla were listed in 2012, by the regional government of the autonomous region of Andalucía and thereby offered some protection.

THOMAS SOPWITH Jnr.

THE EARLY YEARS

It was inevitable that Thomas Sopwith jnr. (Tom) was going to have a successful life. He was born on 2 July 1838 at Newcastle-upon-Tyne in North-East England.⁶ His parents Jane and Thomas Sopwith snr. (Thomas) came from modest backgrounds. Thomas Sopwith snr. had a reputation as a competent surveyor and geologist and had published various illustrated works on the subjects. As a surveyor, he took on official duties that led him further afield that required him to open offices in London. In 1824, he carried out a series of surveys for Mr. Joseph Dickinson, of Alston of the lead mines of the Greenwich Hospital Estates in the North Pennines. It was the start of a lifetime's involvement with that area but he also spent time in Newcastle running the family joinery business.^{7,8}

In 1845, Thomas Sopwith snr. was offered the post of Mine Agent for the Beaumont family, who were major land and mine owners in the Northern Pennines and operated one of the largest lead mining businesses in Britain. They also owned the Bretton Estate, to the south of Wakefield, in the Yorkshire Coalfield and, at that time, W.B. Beaumont was one of the wealthiest men in the country. The contract Thomas Sopwith snr. had with Beaumont gave him some degree of flexibility with his life and he was able to spend up to a quarter of the year running his own London business. This provided the opportunity for him to mix and make friends with some of the greatest scientific minds of the period.⁸

While all this was going on, Tom was growing up. He already had four older siblings,



Figure 2. *Thomas Sopwith junior. Published in Industria Minera [Linares] No. 105, 31 October 1898.*

Jacob (b.1829 and son of Thomas's first wife Mary, who died shortly after giving birth), Ursula (b.1832), Mary Jane (b.1834) and Isabella (b.1836) and five more were to follow him: Anna, Emily, Arthur, Edmund and Alice.⁸ Initially, Tom was educated in London, at the Bruce Castle School, a progressive boarding school, located in North London. For his final schooling he returned to the North of England to complete his education at Croft House, Brampton in Cumbria, some 20 kilometres west of Allenheads Hall, the newly built residence of the Sopwith family.⁶

Having completed his education, 16-year old Tom was articled for five years to William G. Armstrong, who had established the Elswick engineering works adjacent to the River Tyne, Newcastle. It was here that Thomas served his apprenticeship. The Elswick works specialised in the production of hydraulic equipment, including engines but later became a major manufacturer of munitions.⁶ It was during his time at Elswick that Tom's mother died in 1855. However, in 1858, Thomas Sopwith snr. married his third wife, Annie Potter and she would accompany him on many of his future excursions touring Europe.

Tom returned to Allenheads in 1859 and took up employment with the Beaumonts, undertaking various mining duties, either underground, or in the mining office of the W.B. mines. He was put under the guidance of T.J. Bewick, who at that time was acting as Engineer and Chief Assistant to Thomas's father, the Mine Agent.⁶

It had been recognised some years before Tom's appointment that the reserves of lead ore in the W.B. mines were becoming depleted and so in 1862 Tom was commissioned to search for new sources of lead in some of the principal lead mining centres of Europe. Tom retained an agent's salary and received expenses from Beaumont whilst in Europe. Thomas Sopwith snr. recorded in his diary for Tuesday 15 July 1862: '*At 7 past 10 this forenoon my son Tom left 43 Cleveland Square (the London Residence) to spend about a year on the Continent under arrangements made by Mr. K.D. Hodgson M.P. on behalf of W.B. Beaumont Esq. M.P. The general object of this tour is improvement by opportunities of visiting mining establishments in various parts of Europe and more especially in Austria, Prussia and Spain, it being understood that on his return he will apply such acquired information to the service of Mr. Beaumont and who entirely defrays the expenses of his tour*'.⁹

EUROPE AND EVENTUALLY LINARES

We do not know the full details of Tom's journey around the mining areas of Europe but we do know that he would spend longer than a year on his tour. He was seriously ill for part of this time with an attack of rheumatic fever. He convalesced at Aix-la-Chapelle (Aachen), then in Prussia, close to the border with Belgium where the hot

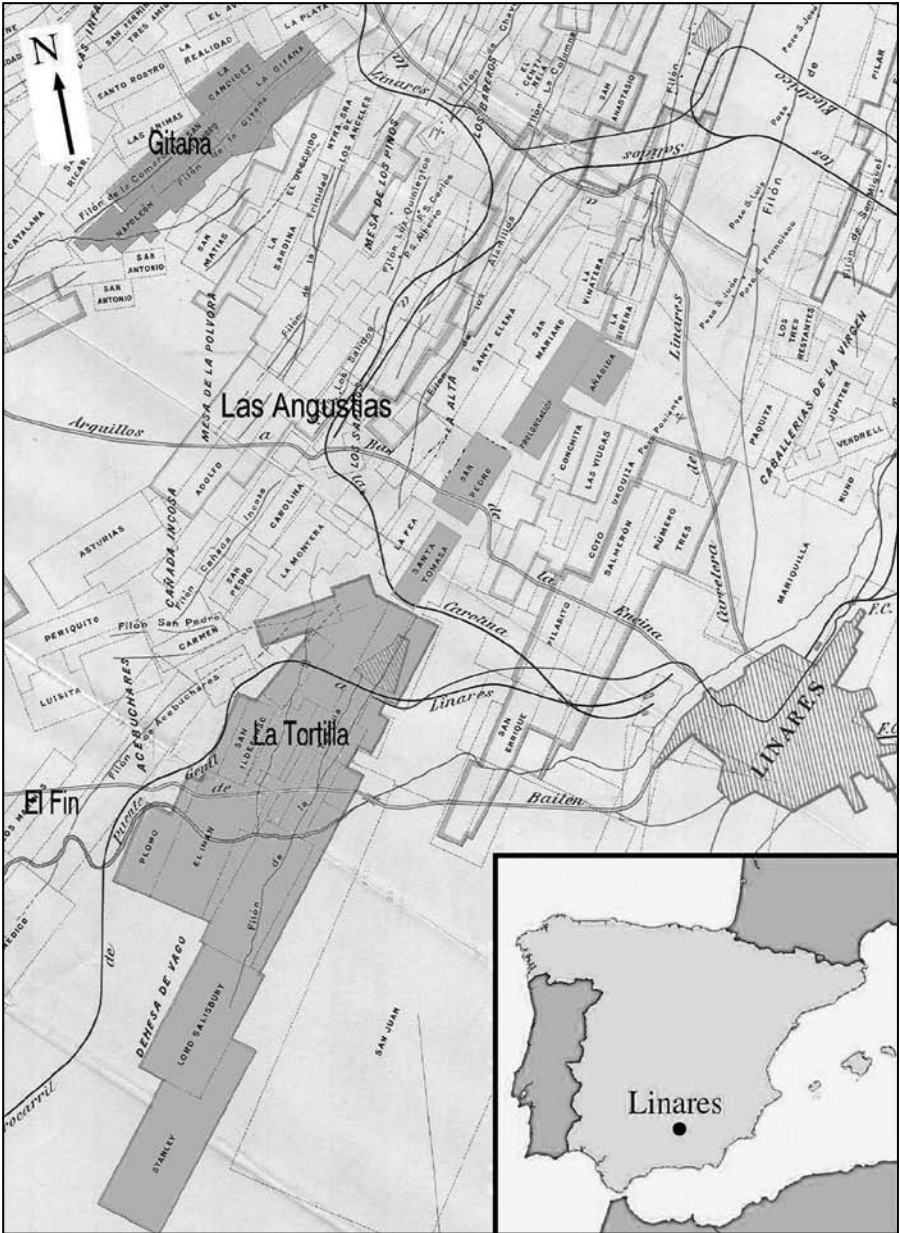


Figure 3. Location of the Sopwith mining interests. La Tortilla, Las Angustias, Gitana, and El Fin. [Based on a concession map - Hereza, A. and de Alvarado, A. 1926. 'The Metalliferous Deposits of Linares and Huelva'. Excursion A-3, XIV International Geological Congress, Madrid 1926. Instituto Geológico España, Madrid. Concession map facing p.26.]

sulphur springs have been renowned for centuries as a cure for rheumatism. He may well have caught the disease while visiting the adjacent zinc mines at Moresuet, Belgium where he saw the newly invented steam-driven rock drill in action.⁶

By 1 June 1863 he had already been to Spain and was then in Bex, Switzerland where there were deposits of copper and salt. It is clear that Tom had aroused the interest of Mr Beaumont about mining prospects in Spain as we learn that Tom desired to go back there, in preference to visiting mine sites in Austria.¹⁰

Tom was generally impressed with what he had seen in his travels. One letter to his father records his enthusiasm generated by his visit to Moresuet. *'Everything about the mines there is really a long way ahead of England and it is a great pity it should be so but the next generation will find it out if we do not'*.⁶

By the end of June 1863, Beaumont had come to a decision about Tom's direction of travel. He was to proceed at once from Geneva to Spain. He could if he wanted to, visit the Mont Cenis tunnelling project on the way, where steam-driven rock drills were being used to drive a 13.7 km long railway tunnel through the Alps to connect France and Italy. The following year Tom presented a paper on the Mont Cenis Tunnel to the Institution of Civil Engineers, London for which he was awarded a prize for its content.^{6,12}

When in Spain, Tom was to ascertain whether and on what terms, a satisfactory lead mining field could be had. In the following month it was apparent that some progress had been made in achieving this, as arrangements were put in place for £200 to be made available for Tom's use. Hodgson, who was now the Governor of the Bank of England but was still dealing with the financial affairs of the Beaumonts, made the necessary arrangements.^{11,13}

Tom visited Linares in July 1863 and was of the opinion that the mining ground adjacent to the town was of great promise, although it had been neglected for a very long period. He was persistent with his opinion and by mid-October, W.B. Beaumont was in Spain to meet him. The meeting with Beaumont went well and clearly he was prepared to try the prospect at Linares. By December, it was apparent that Tom would do very well out of the arrangement. For a period of three years, and for a stipulated salary, he would be the mining engineer and manage the La Tortilla Mine at Linares. It was agreed that Beaumont would deal with matters relating to the business whilst Tom would consult with his father to address those relating to mining.^{14,15}

LA TORTILLA

GEOGRAPHY / TOPOGRAPHY

The concessions of the La Tortilla mine lie approximately 3 kilometres west of the town of Linares. The main road from Linares to Bailén and a new northern by-pass now split the concessions. Several dried up streambeds traverse the northwest side of the concessions. The land rises northwards from 340m to 380m, where the main