

CHAPTER 1. NINETEENTH CENTURY DEVELOPMENT

In the course of the 19th century the Malayan tin mining industry emerged from a position of comparative insignificance to one of world importance. By 1900 the bulk of the world's tin supply was mined in the Federated Malay States.¹ This chapter will establish the context for studying Chinese tin mining labour by providing an overview of the development of the Malayan tin mining industry to 1900. The chapter is divided into three sections. Section 1 includes a brief description of the tin-fields of the Malay States, since their nature and location determined the type and extent of mining activity undertaken. Section 2 contains an overview of the origins and development of the Malayan tin mining industry from early times through the period of rapid expansion after 1820. The final section contains an examination of the main factors that stimulated the rapid increase in tin production during the 19th century.

1. THE TIN-FIELDS OF THE MALAY STATES:

As shown in Figure 1 below, the tin-fields of the Malay States belong to the large metallogenic tin province of Southeast Asia that traverses Burma, Thailand, the Malay peninsula and parts of Indonesia. Geologically, the tin-fields owe their existence to the granitic composition of the mountain ranges in this geographical zone.² Deposits of cassiterite, the most common form in which tin occurs naturally, are classified in this zone into three main types: *primary* deposits, where the ores occur as lodes in the margins of granite masses and in the contact zone between granite and sedimentary rock; *eluvial* deposits, where tin-bearing

¹ Following the institution of the British Residential System after 1874 the four states of Perak, Selangor, Negri Sembilan, and Pahang were "federated" in 1896 and became known as the Federated Malay States. After Britain's 1904 *entente cordiale* with France rulers of the northern Malay States also gradually accepted British advisers. However, the five states of Kedah, Perlis, Kelantan, Trengganu and Johor were excluded from the Federation. They became known as the "Unfederated Malay States".

² Detailed accounts of the geological evolution and physical geography of the Malayan peninsula are given in Ooi, *Land, People and Economy*, pp.1-27; P.P.Courtenay, *A Geography of Trade and Development in Malaya*, London, G.Bell & Sons Ltd., 1972, pp.42-53; Capt. James Low, "Observations on the Geological Appearances and General Features of Portions of the Malayan Peninsula, and of the Countries lying betwixt it and 18th North Latitude", *Asiatic Researches*, Vol.28, 1831, pp.130-162; Fermor, *Report Upon the Mining Industry*, pp.9-21; Frank Owen, "A Review of the Tin Industry of the Malay Peninsula Up to the End of 1899", *The Mineral Industry*, Vol.9, 1901, pp.647-650; Ginsburg & Roberts, *Malaya*, pp.1-16.

rock has been broken down and a mineral containing a higher proportion of the metal than the parent rock is left *in situ*; and *alluvial* deposits, where disintegrated lodes and associated weathering material has been transported by water from the mountains into rivers and re-deposited as silt in the valley plains. In this latter sequence the heavy cassiterite grains are deposited first with the lighter sediments accumulating above to form the so-called overburden.

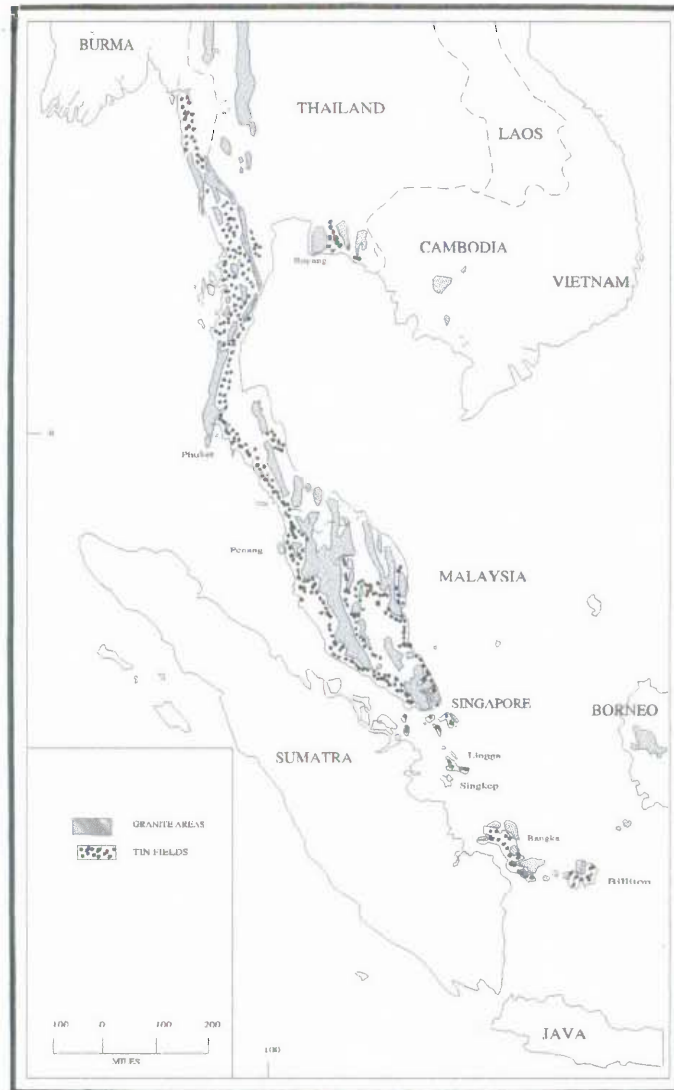


Figure 1. The Tin-fields of Southeast Asia

In the Malay States the principal ranges formed from granite are the Bintang Range, the Kledang Range, the Main Range, the Benom Range and, lastly, the range nearest the east coast. These ranges give rise to numerous streams that rush rapidly down the mountain sides to unite into rivers in the valley plains before winding slowly towards the sea. As shown in Figure 2 below, these ranges divide the tin-fields of the Malay States into two well-defined but unequal

belts on the western and eastern sides of the country. The belts are separated by a zone that is virtually devoid of tin resources.³

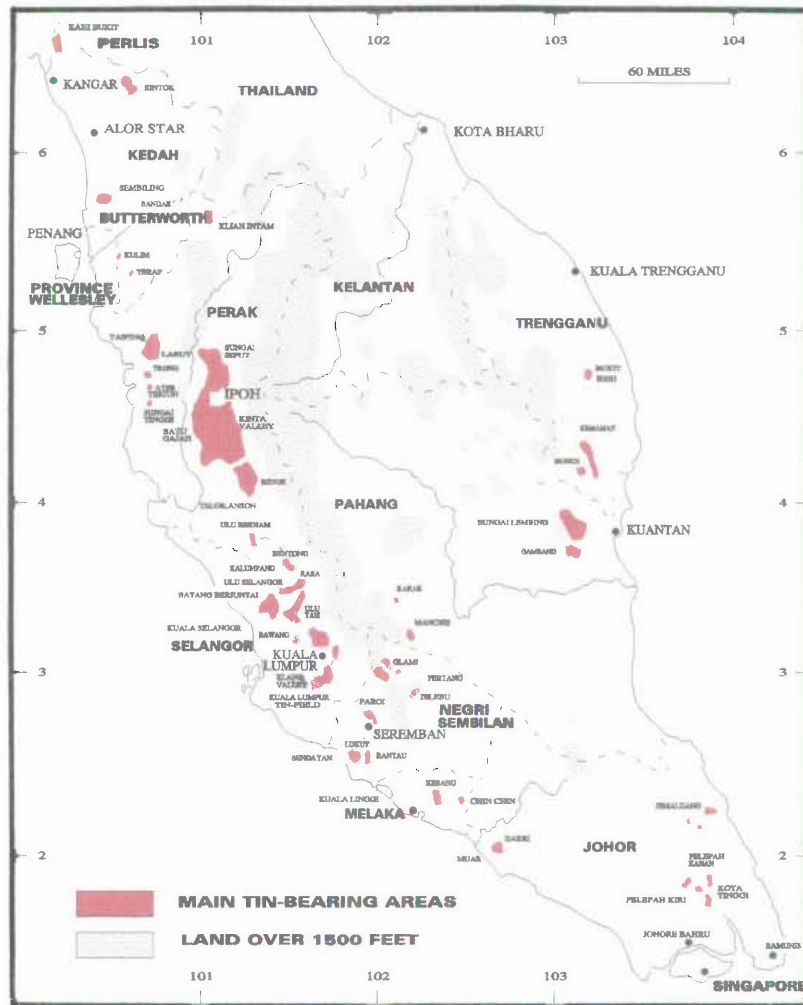


Figure 2. The Tin-fields of the Malay States

³ Although lode and placer deposits are found on the Main Range, these are of relatively minor importance. A simplified cross-section of a Malayan tin-field reveals a limestone bedrock covered by a layer of rich stanniferous gravel or sand on which lies the overburden. Irregularities occur in the surface of the limestone bedrock as a result of *karst* weathering and the formation of lapies and pinnacles. The richest concentrations of cassiterite are located in pockets in the limestone surface. Coarser grains of ore lie at higher levels while the finer particles are located farther away in the valley plains. The overburden is thicker in the plains than near the hills and the ground water table is closer to the surface in the plains than in the higher areas. While often one or more layers of payable stanniferous gravel are located higher in the overburden, the richest layer always lies just above the bedrock. Payable tin-bearing earth is known variously as pay-dirt, pay-gravel, tin-wash or tin-dirt, but the richest stanniferous layer above the bedrock is designated *karang* by the Malays. See Wong, *The Malayan Tin Industry to 1914*, p.2; Fermor, *Report Upon the Mining Industry*, pp.11-18; H.M.Beecher, "Mining in the Malay Peninsula- A Field for Mechanical Appliances, Hydraulic and Electric Transmission of Power", *Transactions of the Institution of Mining and Metallurgy*, Vol.1, 1892-93, pp.83-86, 90-93; W.T.Saunders, "Tin Mining in the Straits Settlements", *Transactions of the Institution of Mining Engineers*, Vol.27, 1904, p.343.

The western tin-belt, the largest of the two zones, contains extensive concentrations of alluvial cassiterite and smaller less important lode or vein deposits. Located in an area parallel to the Main Range, and on either side of the subsidiary granite ranges to west, the belt begins in Perlis and Kedah in the north and stretches southward through Perak, Selangor, western Negri Sembilan and Melaka, before terminating in the Muar district of Johor (Figure 2). The largest and most productive areas of mineralisation are located in Perak (especially in the Taiping and Kinta Valleys and the Bidor fields), and in Selangor (particularly in the district around Kuala Lumpur).⁴ A combination of the abundance of easily accessible surface alluvial deposits, the availability of river transport and the ease of access to Straits ports has determined that tin mining in the Malay States has concentrated on the western side of the peninsula.

The eastern tin-belt, which lies on the eastern side of the Main Range, spreads from Trengganu in the north through western Pahang and then in a south-easterly direction to eastern Negri Sembilan and Johor (Figure 2). A large gap occurs in the belt south of the Pahang River. As in the west, the tin deposits of the eastern tin province are associated with granite. In contrast to the west the deposits are less continuous and less productive occurring more in the form of lodes and eluvial deposits. The most productive deposits in the eastern tin-belt are located in eastern Pahang (particularly in the vicinity of Sungei Lembing and Bentong, where primary deposits are mined largely by underground methods), in Trengganu (especially in the Kemaman district), and in eastern Johor (in an area north-west of Kota Tinggi and south of Jemaluang).

⁴ Tin deposits in the Kinta Valley are located along margins close to the granite contact zone. In Selangor, tin is associated with the valley of the Selangor River and its tributaries the Garing, Serendah, Kuang and, in particular, the upper Klang which is surrounded by a long tongue of granite extending southwards from the Main Range to beyond Puchong. The high mineralisation of the area is due to the shallow depth of the granite under the environs of Kuala Lumpur. As in the Kinta Valley, the margins of the upper Klang basin are flanked by limestone, especially in the east. See J.Ferrington De La Croix, "Some Account of the Mining Districts of Lower Perak", *Journal of the Royal Asiatic Society Straits Branch*, 1887, pp.2-3; J.A.Hampton, "Tin Deposits of the State of Perak, Straits Settlements", *Transactions of the Mining Association and the Institute of Cornwall*, Vol.1, 1887, pp.144-6; E.R.Pike, "Mining in Perak, Straits Settlements", *Transactions of the Mining Association and the Institute of Cornwall*, Vol.3, 1892, pp.195-96.

II. ORIGINS AND EXPANSION OF THE TIN MINING INDUSTRY:

Archaeological evidence confirms that tin has been mined in the Malay peninsula from earliest times. Until the discovery of tin in Banka in 1711 the Malay peninsula was the main source of the metal in the Archipelago.⁵ Before the 19th century tin mining was small scale, sporadic and limited in scope. Nevertheless, records extant that it was an important economic activity.⁶ Tin also constituted a valuable commodity in the early trading networks of the region with merchants arriving from all over Asia to purchase the metal at Melaka.⁷

Following the discovery of the Cape route to India in the 15th century tin from the Malay Archipelago was introduced into the European market, the commercial preserve of Cornish tin. Attempts to monopolise the export trade were subsequently made, with varying success, first by the Portuguese after their conquest of Melaka in 1511, and later by the Dutch (under the aegis of the Dutch East India Company), after 1641.⁸ In the course of the 17th and

⁵ The Ptolemies, for example, knew of production in the Malay States at the time when the first Cornish mines in Britain were being worked. It is also claimed that the demand for tin in the Bronze Age of Malaya was met by production in local mines and that the vast quantity of tin used in the bronze works of the ancient Mediterranean came from the Malay peninsula as well as Spain and Britain. See Wong Lin Ken, "The Malayan Tin Industry: A Study of the Impact of Western Industrialisation on Malaya", in K.G.Tregonning (ed.) *Papers on Malayan History*, Singapore, *Journal of Southeast Asian History*, 1962, p.10; E.S.Hedges, *Tin in Social and Economic History*, London, Edward Arnold, 1964, pp.1-23.

⁶ During the time of the Melaka Sultanate tin formed an important tribute item that the Sultans received from the northern rivers under their jurisdiction. A tin coinage was in also in existence in Melaka before its conquest by the Portuguese in the 16th century. See Fernor, *Report Upon the Mining Industry*, pp.21-22; Barbara Watson Andaya, *Perak. The Abode of Grace: A Study of an Eighteenth Century Malay State*, Kuala Lumpur, Oxford University Press, 1979, pp.17-18, 25-27.

⁷ As early as the 5th century Indian merchants had exported tin from the Malay peninsula to India where it was used in the manufacture of Hindu images. Arab writers also make reference to tin exports from the Malay States during the 9th century. By the middle of the 13th century tin had been recorded as a minor product of Kelantan and Pahang that was exported to China. In 1408 and 1436 references to Melakan tin were made by secretaries of the Chinese envoy Admiral Cheng Ho. In China tin was beaten into leaves and burnt in official offerings. See Ryan, *The Making of Modern Malaya*, pp.13-23; Kennedy, *A History of Malaya*, pp.4-8, 28-29; Wang Gungwu, "The Nanhai Trade", *Journal of the Malaysian Branch of the Royal Asiatic Society*, Vol.31, Pt 2, June 1958, pp.1-35; Hedges, *Tin in Social and Economic History*, pp.93-95.

⁸ As early as 1513 the Portuguese had imported tin from the East into Europe. The Dutch, soon after they ousted the Portuguese from Melaka, established trading posts on the Perak River and at Kuala Selangor to collect tin and to control the tin trade. According to Fernor, Dutch records show that 6,000 pikuls (about 344 tons), of tin ore were exported from Melaka in 1649 Fernor, *Report Upon the Mining Industry*, p.22. See also P.O. de Bruijn, "Trade in the Straits of Malacca in 1785" (transl. B.Harrison), *Journal of the Malaysian Branch of the Royal Asiatic Society*, Vol.26, Pt.1, July 1953, pp.56-62; G.Irwin, "The Dutch and the Tin Trade of Malaya in the 17th Century", in J.Ch'en & N.Tarling (eds.), *Studies in the Social History of China and South-East Asia*, Cambridge, Cambridge University Press, 1970, pp.267-287; Andaya, *Perak. The Abode of Grace*, pp.5-6, 21-22, 42-50; Ryan, *ibid*, pp.33-65; Kennedy, *ibid*, pp.20-2; R.J.Wilkinson, "The Peninsular Malays", in R.J.Wilkinson (ed.), *Papers on Malay Subjects*, Kuala Lumpur, Oxford University Press, 1971, pp.47-70; R.Winstedt & R.J.Wilkinson, "A History of Perak", *Journal of the Malaysian Branch of the Royal Asiatic Society*, Vol.12, Pt.1, June 1934, p.13-17, 24-50.

18th centuries the Dutch monopolised, by means of treaties with local chiefs, tin exports from Kedah, Junk Ceylon (Ujong Salang), Perak, Selangor, and Sungei Ujong.⁹

When in the closing decades of the 18th century the English East India Company initiated a renewed interest in the Malay Archipelago, the trade in tin received particular attention.¹⁰ As a consequence of Dutch control over the tin production and trade of Banka, Britain's interest focused on handling output from the Malay peninsula and southern Siam. Following the British occupation, first of Penang (1786) and Melaka (1795) and then Province Wellesley (1800) and Singapore (1819), Dutch suzerainty over the peninsula gradually diminished. As the old treaties lapsed a trade in tin developed between Perak and Penang.¹¹ Meanwhile, the tin trade at Melaka declined considerably.¹²

Following the enactment of the Anglo-Dutch Treaty in 1824, which formally established the Straits Settlements and divided the area into two separate spheres of influence (the Dutch to control the Archipelago and the British the peninsula), the British principle of free trade was applied to the Straits Settlements.¹³ With this impetus tin production in the

⁹ The local chiefs undertook to supply, at fixed prices favourable to the Dutch buyers, all or most of the tin produced in their territories. Agents of the Dutch East India Company collected tin ore at the river mouths. In Negri Sembilan the Dutch were able to enforce their monopoly through control of the sea-coast and the river mouths. In 1755 Dutch monopoly over the tin trade was extended to the island of Banka, off the southern coast of Sumatra. See D.K.Basset, "European Influence in the Malay Peninsula 1511-1786" in Mills, *British Malaya*, pp.13-14; R.Bonney, *Kedah 1771-182*, *The Search for Security and Independence*, London, Oxford University Press, 1971, pp.18-19; Newbold, *British Settlements*, Vol.II, pp.93-95.

¹⁰ This interest was due partly to the metal's intrinsic value but, more importantly, was due to the fact that tin was one of the few commodities in demand in the China market. For details see Tregonning, *A History of Modern Malaya*, pp.70-72; Ryan, *The Making of Modern Malaya*, pp.76-79; Andaya & Andaya, *A History of Malaysia*, pp.87-90; Michael Havinden & David Meredith, *Colonialism and Development-Britain and Its Tropical Colonies, 1850-1960*, London, Routledge, 1993, pp. 9-41; Swettenham, *British Malaya*, pp.34-35.

¹¹ In 1787 the annual output of tin from Perak was approximately 170 tons. By 1800 output had increased to 283 tons and by 1804 it had risen to 510 tons. In 1790, four years after its establishment, Penang had attracted from the Malay States so much of the trade previously monopolised by the Dutch that the latter admitted the East India Company's mastery of the Straits tin trade. By 1806 tin accounted for 16 per cent of Penang's trade by value. By 1816 this proportion had risen to 20 per cent. Perak, *Report Upon the Mining Industry*, pp 22-23. Mills, *British Malaya*, pp.74-75.

¹² In 1808 Raffles recorded "...the Palembang and Lingir vessels import about 1,500 piculs of tin annually, which, with what is brought down from other quarters, may be estimated at from 2,000 to 3,000 piculs annually. Rumba, a Malay country in the interior of the Peninsula, ... formerly under a contract with the Dutch Government, supplied of itself 2,000 piculs, but now only sends about 400 piculs annually, and this is obtained at some risk in advances. The remainder might, perhaps, be obtained in the same way, but, at present, it seems to take its course down the Pahang River on the other side of the Peninsula, from whence it is transported in small prows to Rhio, etc..." Quoted in Victor Purcell, *The Chinese in Modern Malaya*, Singapore, Oxford University Press, 1960, p.37.

¹³ Treaties concerning this had been made in 1818 with Perak, Selangor and Johor (a treaty had previously been made with Kedah). In 1831 a treaty was made with Rembau. Detailed studies of the events leading to the enactment of the Anglo-Dutch Treaty are given in N.Tarling, *Anglo-Dutch Rivalry in the Malay World, 1780-1824*, Sydney, (no publisher recorded), 1962; Mills, *ibid.*, pp.69-80; Ryan, *The Making of Modern Malaya*, pp.76-92; Kennedy, *A History of Malaya*, pp.98-102; Bonney, *Kedah*, pp.42-44, 137-154, 159-60.

Malay States gradually increased. By 1818 annual output from the tin mines in Perak was estimated at 8,000-9,000 pikuls (450-550 tons), and in Selangor at 2,000 pikuls (approximately 120 tons). By 1835 annual tin production in the Malay peninsula was estimated as follows;

Table 1
Tin Production in the Malay Peninsula, 1835.

<u>West Coast</u>			<u>East Coast</u>		
	<u>Pikuls</u>	<u>Tons</u>		<u>Pikuls</u>	<u>Tons</u>
Sungei Ujong	7,000	417	Pahang	1,000	58
Perak	7,500	446	Kemaman & Trengganu	7,000	417
Kedah	600	36	Kelantan	3,000	174
Ujong Salang	1,500	88	Patani	1,000	58
Pungah	1,500	88			
Selangor	3,600	216			
Total	22,600	1,345	Total	12,000	707

Source: Newbold, *British Settlements in the Straits*, Vol.I, pp.424-425.

Tin production in the Malay States increased spectacularly in the second half of the 19th century. Mining enterprise, particularly in the western states, expanded throughout the 1840s, 1850s and 1860s to reach, by the 1870s, a scale hitherto unknown in the peninsula. During the 1840s annual production increased to over 2,500 tons; by 1874 it had reached 4,200 tons. At this time Malaya ranked fourth behind Great Britain, Australia and the Dutch East Indies in terms of world tin production.¹⁴ A second and larger expansion in production occurred in the 1880s and 1890s. By 1883 annual tin output had increased to over 16,900 tons and Malaya had become the world's largest tin-producing country. By 1890 annual production exceeded 27,000 tons and by 1895 it had increased to nearly 50,000 tons. By this time over half the world's total tin supply was mined in the Malay States.

¹⁴ See Tables 2 & 3 in Appendix A.

III. FACTORS PROMOTING THE EXPANSION IN TIN PRODUCTION:

The rapid expansion in Malay tin production during the 19th century was the result of the interplay of several external and internal factors. These factors can be discussed broadly as: (i) a rapid growth in the industrial demand for tin in Europe and the United States from about 1820 that had a particular impact on the direction and volume of the Straits tin trade; (ii) an increase in factor supply involving the discovery of rich and extensive ore deposits in the Malay States in the 1840s and 1880s and, concomitantly, a rapid influx of Chinese capital and labour into the interior states; and, (iii) the development of an administrative and physical infrastructure, particularly after 1874, that greatly facilitated an expansion in tin production by private enterprise.

The Growth in Industrial Demand for Tin

Tin mining provides a particular example of the economic interdependence between advanced industrialised nations requiring raw materials and the underdeveloped countries capable of providing them. In the development of the Malayan tin mining industry this interdependence arose because domestic supply was of inadequate quality and quantity (or was not available at all), in the countries where the manufacture of tin products was undertaken on a large-scale commercial basis. Historically, this economic relationship began in the early decades of the 19th century with the growing industrialisation of Britain and the United States that created an ever increasing demand for tin.

The growth in industrial demand for tin was chiefly the result of the expansion of the British tin-plate industry. From a relatively small basis (only 9 tin-plate works in 1800), the British tin-plate industry developed rapidly to become, by 1875, the largest in the world supplying practically all the market's requirements.¹⁵ The driving force behind the growth of

¹⁵ By 1850 the number of tin-plate works in Britain had increased to 34 and tin-plate output amounted to 748,000 boxes. By 1875 the number of works had increased to 75 with an output of 3,500,000 boxes. See Wong, *The Malayan Tin Industry to 1914*, Table 1, p.6. The British tin-plate industry monopolised world production until 1912, when its place was assumed by the industry in the United States. British supremacy in

the industry was an increased demand for tin-plates. The most important uses for tin-plates were in the production of cans for preserving food and in the manufacture of barrels for storing and transporting oil.

In the early decades of the 19th century tin was most commonly used in the manufacture of alloys, in the preparation of scarlet and purple dyes and in the “tinning” of finished iron wares such as saucepans, bridle bits, stirrups and mails. However, the more important use for tin was in the tin-plate industry which by 1805 was absorbing between one-third and one-half of the total annual consumption of tin in Britain.¹⁶ Then in the 1820s a new market for tin-plates evolved with the development of a technique of preserving food in tin cans. By the early 1850s the economic development of several countries created food surpluses that encouraged the growth of large-scale canning industries in Australia, France and the United States. Further stimulus was imparted to the industry after 1860 by the demand for tinned food to meet the military needs of the American Civil War. In the following decades the consumption of tinned food increased rapidly with improved and cheaper processes of canning, the development of communications and the rapid urbanisation of the United States and Western Europe coupled with the growth of disposable income following industrial revolution.

In the United States two additional uses of tin-plates gave important stimulus to the expansion of the British tin-plate industry. The first was the use of tin-plates for the manufacture of barrels to store and transport oil and was consequent on the production of crude petroleum on an industrial scale following the discovery of oil in Pennsylvania in 1859.¹⁷

the manufacture of tin-plates rested on continual improvements in technology and tariff protection that had been conferred upon the industry since 1664. For detailed studies of the history of the manufacture of tin-plates and the growth and development of the British tin-plate industry see W.E.Minchinton, *The British Tinplate Industry- A History*. Oxford, The Clarendon Press, 1957; W.E.Minchinton, “The Diffusion of Tinplate Manufacture,” *Economic History Review* (2nd series), Vol.9 1956-57; pp.349-58; P.W.Flower, *A History of the Trade in Tin: A Short Description of Tin Mining and Metallurgy*. London, George Bell & Sons, 1880.

¹⁶ A tin-plate is a sheet of steel or iron coated with tin to prevent rusting. The process differed from earlier “tinning” methods as the articles were fashioned from the raw material which had already been tinned.

¹⁷ In the ensuing years production increased significantly, the average annual yield being 3,246,228 barrels. By 1874 production exceeded 10,000,000 barrels. Joseph.D.Weeks, “Petroleum”, *Report on Mineral Industries in the United States at the Eleventh Census, 1890*, Washington, 1892, pp.425, 431 cited in Wong, “Impact of Western Industrialisation”, p.19.

The second important demand for tin-plates was for roofing in the frontier settlements where terne-plates (thin sheets of iron or steel coated with an alloy of tin and lead), were used. Although some terne-plates were produced in Philadelphia, the bulk were imported from Britain.¹⁸

The expansion of the British tin-plate industry naturally resulted in an increased consumption of tin. As shown in Table 2 below, the total quantity of tin consumed in Britain multiplied approximately fivefold in the period 1801-1850. During this period tin-plate manufacturers constituted the largest single group of buyers of tin, accounting for between one-third and one-half of the total quantity consumed in each of the years 1805 and 1851.¹⁹

Table 2

Quantity of Tin Consumed in Britain, 1801-1889 (figures in tons).

<u>Year</u>	<u>Cornish Tin</u>	<u>Foreign Tin</u>	<u>Total Consumed</u>
1801-10	11,179	-	11,179
1811-20	16,352	-	16,352
1821-30	26,157	-	26,157
1831-40	35,565	-	35,565
1841-50	50,637	4,284	58,921
1851-60	46,994	21,569	67,663
1861-70	50,309	36,811	87,120
1871-80	49,706	36,646	136,352

Source: Wong, "Impact of Western Industrialisation", Table II, p.20.

Increased industrial demand for tin in Britain had a particular impact on the volume and direction of the Straits tin trade. Prior to 1845 British tin supply had been met almost entirely by Cornish production. This monopoly was maintained partly because tin deposits in

¹⁸ Although initially used for roofing purposes in Britain, France and Germany, the popularity of terne plates for roofing material in the United States resulted in their manufacture becoming an important branch of the tin-plate industry. W.G.Gray, "Tin and Terne Plates", *Twelfth Census of the United States Taken in the Year 1900*, Washington, 1902, Vol. X, pp.99-111 cited in Wong, "Impact of Industrialisation", p.20. See also Flower, *History of the Trade in Tin*, pp.177-181.

¹⁹ In 1805 the tin-plate industry consumed between 357 and 563 tons of a total 1,144 tons of tin consumed in Britain. In 1851 the tin-plate industry consumed between 2,647 and 3,008 tons out of a total 7,635 tons of tin consumed by all industries. Wong, *The Malayan Tin Industry to 1914*, Table III, p.21.

other regions of the world remained unexploited but, more importantly, was due to the prohibitive duties placed on tin imported for domestic consumption that made it uneconomical to utilise foreign tin in the manufacture of tin-plates.²⁰ In the course of the first half of the 19th century, however, the supply of Cornish stream tin began to diminish. This shortage was felt acutely by British tin-plate manufacturers not only because their demand had grown with the expansion of the tin-plate industry, but also because competition for the diminishing tin supply was forthcoming from the manufacturers of dyes.²¹ At the same time, Cornish tin faced serious competition in the Continental market from the cheaper Banca product that was being substituted to meet the needs of European tin-plate producers as more and more of the Cornish product was retained for domestic consumption.²²

As Cornish output diminished, new sources of tin supply were considered including those in the Malay peninsula. Subsequently, British tin-plate producers became dissatisfied with the duties on foreign tin imports that made it impossible for them to obtain raw materials at the lowest possible price; they began to agitate for a reduction in the customs tariff imposed on foreign tin. Eventually, in July 1842, the duty on foreign tin imported from non-British possessions was lowered to £6 per ton – a drastic reduction of £44 per ton less than the previous rate.²³ Simultaneously, differential rates of £3 per ton were introduced in favour of tin and tin

²⁰ Duties on foreign tin imported into Britain were first introduced in 1649. Until December 1796 the duty stood at £53 per ton but in this month was raised by £2.13s. as part of the general rise in customs tariffs implemented to meet financial exigencies of war. Henceforth, the duty on imported tin, as was the case with that on every article in the customs tariff, was raised at rapid intervals. By 15 April 1813 the duty stood at £109.5s. per ton and, although the war with France ended in 1815, remained at this rate until 15 July 1825 when it was reduced to £50 per ton. *Customs Tariffs of the United Kingdom from 1800 to 1849* (c.8706). 1898, pp.16, 34, 39, 368, 538, 654, 682, 778, 854 cited in Wong, *The Malayan Tin Industry to 1914*, pp.8-9.

²¹ Both alluvial and block tin were mined in Cornwall. Of the two types alluvial tin was most suitable for the manufacture of tin-plates because it was uncontaminated and more fluid in the molten state. Besides giving the finished products a superior colour and lustre, alluvial tin produced a coating that was as firm and thin as possible. Consequently, less of the metal was needed to manufacture a specific quantity of tin-plate. Block tin, on the other hand, was less suitable because of impurities associated with the lode ores. In 1812 English refined tin was substituted into the British market. However, although refined tin came to be used in the manufacture of tin-plates it was not the best, nor cheapest, substitute for the alluvial product. The situation may have been remedied by importing alluvial tin produced in the Malay States and Banca had it not been for the prohibitive duties placed on foreign tin.

²² Since at least 1826, when 2,700 tons of Banca tin were imported into Holland, the Cornish tin monopoly on the Continent had been relentlessly encroached upon by the cheaper Banca metal. In the period 1841-1850 the annual sales of Banca tin in Europe averaged 3,197 tons, an amount equivalent to about three times the annual tin in ports from Britain. Flower, *A History of the Trade in Tin*, p.209.

²³ This reduction was the result of the implementation of Sir Robert Peel's free trade policy. This policy was characterised by the reduction of duties on raw materials for British manufactures to low and, in some cases, nominal rates.

ores from British overseas possessions.²⁴ These reductions were the prelude to further changes. In August 1845 the duties on ores and regulus of tin from all places were repealed. Eight years later duties on metallic tin imported for British consumption were abolished altogether.

The abolition of duties on tin imported for British consumption stimulated an inflow of foreign tin into the British market.²⁵ The bulk of the foreign tin imported into Britain came from the Straits Settlements.²⁶ Except for a brief interlude between 1875 and 1885 when competition was met from Australian tin, Straits tin was the principal brand used in the British tin-plate industry.²⁷ As shown in Table 3 below, a significant change occurred in the direction and volume of the Straits tin trade after 1850.

Table 3

Tin Exports from the Straits Settlements, 1844-1873 (figures in tons).

Year	Europe	United States	India	China	Other Countries	Total Exports
1844-48	4,099	1,072	4 824	1,255	978	12,228
1849-53	8,124	3,486	5 081	1,044	554	18,289
1854-58	8,563	4,714	1 766	2,734	973	18,750
1859-63	Complete data not available					
1864-68	21,817	6,707	2 820	7,675	574	39,593
1869-73	21,884	13,907	4 441	9,282	830	50,344

Source: *Straits Settlements Commerce and Shipping, 1844-57, 1863-66; Annual Trade Settlements of the Straits Settlements, 1867-74* compiled in Wong, "Impact of Western Industrialisation", Table V, p.31.

²⁴ The extraordinary prohibitive duty of £400 per ton, which had been levied in 1833 on foreign tin ore imported for smelting, was also reduced. The duty was lowered to £50 per ton for ores and regulus of tin imported from foreign countries and £10 per ton for those from the colonies. The only remaining duty was a levy of £10 per ton on imported tin foil.

²⁵ In 1843 only 98 tons of foreign tin was imported for consumption. Thereafter, the amount increased passing beyond 1,000 tons in 1850. By 1871 the consumption of imported tin exceeded that of Cornish tin which had to rely increasingly on foreign markets for its disposal. The bulk of the foreign metal was consumed by the tin-plate industry, its annual consumption amounting to approximately two-thirds the total annual quantity consumed in Britain in the period 1860-1874. See Wong, *The Malayan Tin Industry to 1914*, Table III, p.21.

²⁶ Previously, tin from the Malay Archipelago had been shipped to Britain by private traders. The trade began soon after the cessation of the East India Company's monopoly of the Indian trade. The bulk of the metal went to Britain by way of the Straits Settlements, particularly Singapore, with the remainder coming from India, Java and Holland. The amount imported, however, was small averaging only 248 tons per year between 1815 and 1841. Furthermore, the imported tin-ore was bonded in warehouses for re-export, having been brought to Britain as ballast. *Report from the Select Committee on the Present State of the Affairs of the East India Company; and on the State of the Trade between Great Britain, the East Indies, and China* (65), 1831, pp.23-24 cited in Wong, "Impact of Western Industrialisation", p.30; "Annual Account of the Tin Trade of Great Britain", *Parliamentary Papers, 1815-1841*.

²⁷ It is not known when Straits tin was first used in the manufacture of tin-plates in Britain. After 1860 it was recorded that most of the tin used in the manufacture of tin-plates came "from the expanding mines in Malaya and Australia". But, given that no important tin deposits were discovered or developed in Australia until 1872 and that in the five years 1871-74 the quantity of Straits tin imported into Britain was about four and a half times that from Australia, it is evident that Straits tin was the principal brand used in the British tin-plate industry until at least 1874. See Flower, *A History of the Trade in Tin*, p.169.

Previous to about 1850 Asian countries, particularly China and India, engrossed a larger proportion of the total tin trade of the Straits Settlements than Europe and the United States combined. After 1850, however, Europe became the most important market for Straits tin. The bulk of the metal exported to Europe went to Britain, which became practically the sole importer by the 1860s.²⁸ Furthermore, the export trade to Europe expanded more rapidly than that to the Asian countries. The shift in importance of the direction of the Straits tin trade from Asia to Europe can, therefore, be attributed (generally) to the rapid expansion in the industrial consumption of tin in Britain and the United States, and (particularly) to the expansion of the British tin-plate industry.²⁹

Two factors contributed to the capture of the British market by Straits tin. Firstly, in the period 1842-1853 Straits tin under the preferential duty was admitted at half the duty levied on foreign tin from non-British possessions.³⁰ Secondly, Straits tin normally sold on the London metal market at prices lower than Banca tin. This was due to a bad reputation for impurity acquired in the 1830s when the tin in the Malay peninsula was mined and smelted by Malay methods.³¹ From 1840 onwards, however, the price gap between Straits tin and other brands began to narrow. As shown in Table 4 below, by the early 1870s Straits tin was fetching almost the same price as English refined tin on the London metal market.

²⁸ The percentages of total tin exports from the Straits Settlements to Europe that went to Britain were: 1844-48, 70 per cent; 1849-53, 69 per cent; 1854-58, 75 per cent; (1859-63, complete data not available); 1864-68, 97 per cent; 1869-73, 98 per cent. Wong, "Impact of Industrialisation", p.32.

²⁹ The tin trade was greatly facilitated by the opening of the Suez Canal in 1869 which shortened the distance between Singapore and London from (approximately) 12,000 miles to 8,000 miles. The technological advances made by the steamship also greatly enhanced the expanding trade. Continuing improvements in communications such as the telegraph also enabled Straits merchants to take greater advantage of favourable prices in Europe and London and to complete transactions whilst tin was in transit. See G. Boggars, "The Effect of the Suez Canal on the Trade and Development of Singapore", *Journal of the Malaya Branch of the Royal Asiatic Society*, Vol 28, 1955; Andaya & Andaya, *A History of Malaya*, p.136-37.

³⁰ These reforms particularly benefited miners in Melaka since under the new tariff schedule tin produced in British territories was liable to lower duties than tin from non-British territories. Because of this advantage Melaka tin sold at a lower value in the Straits market than the metal from the adjoining Malay States. In 1851 it was recorded that the ruling price of Melaka tin in the Straits market was eight to nine per cent below the metal from the Malay States.

³¹ The reputation of Straits tin also suffered from the dishonest practice of adulterating the metal with lead stones and pieces of iron. So excessive was the adulteration that in 1831 trade with China and India was severely depressed. The dishonest practices of the Straits merchants gave Straits tin a bad reputation in the world market. *Report from the Select Committee to Inquire into the Present State of Affairs of the East India Company* (646), 1830, p.397 cited in Wong, *The Malayan Tin Industry to 1914*, p.14. See also Anderson, *Political and Commercial Considerations*, p.124; Newbold, *British Settlements*, Vol I, pp.427-28.

Table 4

The Price Gap Between Refined and Other Brands of Tin on the London Metal Market, 1851-1874 (prices in £ sterling per ton).

Year	Average Price of Refined Tin			Average Price Gap Banka Tin			Average Price Gap Straits Tin			Average Price Gap Common Block Tin		
	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
1851-53	105	1	8	not available			-18	7	6	inadequate data		
1854-56	130	5	8	not available			-9	7	9	inadequate data		
1857-59	133	12	2	not available			-5	1	8	-7	0	0
1860-62	127	16	1	-1	5	0	-5	12	9	-2	13	5
1863-65	110	12	3	-1	7	9	-4	5	8	-3	16	11
1866-68	95	2	3	-4	9	6	-7	1	1	-2	5	8
1869-71	132	18	4	-2	16	1	-4	16	1	-3	14	6
1872-74	132	5	10	-2	1	5	-6	7	6	-0	15	10

Source: Wong, *The Malayan Tin Industry to 1914*, Table VI, p.15.

Note: The - (minus) sign denotes the average price of the metal was lower than the average price of refined tin by the value represented

Several factors account for this change. Firstly, the demand for Straits tin from the mid-19th century was increasing at such a rate as to affect its price. At the same time, the quality of Straits tin had been constantly improving thereby rendering the metal more attractive to consumers. As will be discussed shortly, this improvement was due to the fact that tin from the Malay States, where the bulk of Straits tin was mined, was increasingly mined and smelted by Chinese miners. The third important reason for the increased consumption of Straits tin was that the amount of Banka tin imported into Europe did not increase rapidly enough to meet demand. Consequently, the price of Banka tin tended to rise relatively higher than that of other brands. The final contributing factors were a decline in Australian production after 1882 and the introduction of refined Straits tin of a very high quality following the establishment of the Straits Trading Company in 1886. Overall, these developments had a decisive influence in forcing British manufacturers to substitute Straits tin for the Banka product. As shown in Table 5 below, this resulted in a conspicuous increase in the imports of tin from British possessions in the East after 1860.

Table 5

Foreign Tin Imported Into Great Britain, 1816-1875 (figures in tons).

<u>Year</u>	<u>From British Possessions in the East</u>	<u>From Holland and Dutch Possessions in the East</u>	<u>From Other Countries</u>
1816-20	663	nil	nil
1821-25	721	nil	nil
1826-30	1,131	57	30
1831-35	5,086	423	nil
1836-40	4,143	179	nil
1841-45	4,212	130	nil
1846-50	4,046	785	9
1851-55	6,499	3,615	737
1856-60	8,928	3,966	nil
1861-65	16,385	3,692	14
1866-70	17,795	6,131	5
1871-75	29,257	4,853	11,784

Source: "Account of the Tin Trade of Great Britain", *Parliamentary Papers, 1816-75* cited in Wong, *The Malayan Tin Industry to 1914*, Table VII, p.16.

The Increase in Factor Supply

The industrial demand for Straits tin inevitably stimulated its production. But, with the exception of Melaka, the Straits Settlements were devoid of tin resources. What passed as Straits tin was chiefly the product of the Malay States and Ujong Salang after it had been processed in the tin refineries of the Straits Settlements. As shown in Table 6 below, the amount of tin imported from the Malay States to the Straits Settlements increased after about 1850 and became particularly conspicuous about 1865. Moreover, this increase occurred almost wholly in the ports of Penang and Melaka primarily because the expansion in tin production was confined to west coast tin states of their peninsular hinterland.

Table 6

Amount of Tin Imported from the Malay Peninsula into the Straits Settlements,
1844-1873 (figures in tons).

<u>Year</u>	<u>Singapore</u>	<u>Meaka</u>	<u>Penang</u>	<u>Total</u>
1844	269	439	173	871
1845	379	1,170	0.2	1,549.2
1848	261	507	224	1,082
1847	264	634	183	1,081
1848	590	534	230	1,184
1849	386	534	245	1,184
1850	343	730	179	1,282
1851	552	871	182	1,605
1852	505	778	233	1,456
1853	486	639	210	1,325
1854	604	498	230	1,332
1855	505	466	351	1,272
1856	536	439	289	1,264
1857	520	371	167	1,058
1858	464	670	485	1,619
1859	na	na	na	na
1860	na	na	na	na
1861	na	na	na	na
1862	na	na	na	na
1863	494	690	647	1,831
1864	524	700	744	1,968
1865	475	1,139	486	2,130
1866	405	1,330	376	2,101
1867		no separate data available		2,030
1868	515	1,231	2,321	4,097
1869	517	2,438	1,650	4,625
1870	511	1,807	2,321	4,639
1871	686	1,635	2,402	4,713
1872	530	1,435	1,653	3,648
1873	575	1,334	416	2,335

Source: Wong, *The Malayan Tin Industry to 1914*, Table IX, p.30.

Two significant developments occurred on the Malayan supply side to facilitate the rapid increase in tin production. Firstly, from about 1820 onwards the western tin mining states experienced a rapid influx of Chinese capital and labour in such volume and numbers as to assume control of production. The labour-intensive methods employed by the Chinese were eminently suited to the exploitation of the alluvial deposits.³² The second important stimulus involved the discovery of rich and extensive ore-deposits, first in the 1840s in Selangor and the Larut district of Perak, and later in the 1830s, in the Kinta Valley. These discoveries

³² Chinese mining methods will be discussed in greater detail in Chapter 3.

encouraged a second and much larger influx of Chinese capital and labour to the western tin states.

The tin deposits in the Malay States that had been brought into production by the early decades of the 19th century were those that were within easy reach of rivers, the natural means of communication.³³ The most important mines were located on the western side of the Peninsula in the southern half of the Kinta Valley in places such as Batang Padang, Kampar, Chenderiang and Bidor. Tin was also mined in smaller quantities in places along the Perak River, from Budara in the south to Saiyong in the north.³⁴ In Selangor the most important mining district was Lukut, but tin was also occasionally mined in small quantities in the Langat and Bernam districts.³⁵ Farther south in the Klang Valley tin mining occurred more regularly, particularly in the rich tin-fields surrounding what was later to become Kuala Lumpur.³⁶ In Sungei Ujong tin mines were located near the Sungei Ujong branch of the Linggi River, about 42 miles from the river mouth. Tin mined in Sungei Ujong was transported down the Linggi River and carried by Malay traders to the Chinese merchants at Melaka. On the eastern side of the Peninsula tin was mined on a much smaller scale in Pahang.³⁷

In these early mining centres tin production was monopolised by local chiefs who held, under commission from the Sultan, the right of control over a specified area of land from which they were entitled to draw revenue. Although it is recorded that production for export in some areas required the presence of Chinese miners, labour in the mines was provided, as it

³³ As shown in Table 1 above the west coast states in particular Sungei Ujong, Selangor and Perak, were the main centres of production in 1835.

³⁴ Capt. James Low, "Observations on Perak", *Journal of the Indian Archipelago*, Vol.IV, 1850, p.498. See also Andaya, *Perak, The Abode of Grace*, Figures 5 & 6, pp.xv, xvi.

³⁵ Lukut was originally a province of Selangor. In 1873 Lukut, along with Sungei Ujong, was incorporated into the Negri Sembilan configuration.

³⁶ Petaling and Serdang were well-known mining centres by 1824.

³⁷ R.G.Cant, *An Historical Geography of Pahang*, Singapore, Monograph of the Malaysian Branch of the Royal Asiatic Society, No.4, 1974, pp.37-38.

had been for centuries, principally by Malays.³⁸ Then in the 1820s, following the establishment of British administration and the institution of free trade in the Straits Settlements, tin became easier to obtain and more profitable to deal in. The Chinese became more interested, first in purchasing tin and then, in order to obtain more regular supplies, in mining the metal themselves. Increasing numbers of Chinese traders and miners began to cross over from the Straits Settlements using the ports of Singapore, Melaka and Penang as bases from which they penetrated the Malay States in search of tin.

The beginning of sustained Chinese tin mining in the Malay States dates from 1824. At this time it was recorded that 200 Chinese miners were working in the Lukut district of Selangor (Figure 3).³⁹ A decade later the number had increased to 400.⁴⁰ By 1828 Chinese tin mining was also well established in Sungai Ujong along the banks of Linggi River.⁴¹ At the same time there was estimated to be upwards of 400 Chinese residents engaged in mining and as traders in Perak.⁴² Chinese mining was also being undertaken in the greater security of the British-administered Melaka territory.⁴³ Besides the Malay States on the western side of the

³⁸ Wong Lin Ken cites a 1790 Dutch report in which it was stated that the principal miners in Perak and Selangor were Chinese and that production in these states was declining because the Chinese were leaving. Begbie also states that tin mines "throughout the Malay Peninsula are wrought by Chinese". See Wong, *The Malayan Tin Industry to 1914*, p.18; Begbie, *The Malayan Peninsula*, p.407. On the other hand, T.J.Newbold, an eminent British authority on Malay affairs in the early 19th century, asserts that the Malays were the principal miners in the Peninsula. See Newbold, *British Settlements*, Vol.1, p.98-99, 428-29.

³⁹ It should be noted that no accurate count of the Chinese mining population in the Malay States existed before British intervention. Moreover, the population, like pioneer mining populations everywhere, fluctuated wildly with changes in the tin price and productivity of the tin deposits. It was also seriously affected by political conditions in the Malay States which, prior to British intervention, were so unstable as to make life and work precarious for the Chinese miners. These disturbances—some of which are discussed in greater detail in Chapter 2, caused large internal migrations. Nevertheless, the available estimates are able to indicate the scale of the Chinese influx into the tin mining states.

⁴⁰ Of the various regions within easy access of Melaka that were known to possess tin deposits, Lukut was the closest to the sea. As transport of both tin and supplies was either by river or porter it was logical that such a location should be preferred by the early Chinese miners and traders in the region. In September 1834 the Chinese miners at Lukut massacred their Malay employers but were in turn ambushed by Malays when retreating to Melaka. The Lukut mines were abandoned for a time and then re-worked by a second party of Chinese miners from Melaka. R.N.Jackson, *Immigrant Labour and the Development of Malaya, 1786-1920. An Historical Monograph*, Kuala Lumpur, Government Printers, 1961, p.32. See also Blythe, "Historical Sketch" p.65; Begbie, *ibid.*, p.425; Anderson, *Political and Commercial Considerations*, p.202; Newbold, *ibid.*, pp.33-34.

⁴¹ Though details of the actual number of miners involved vary, it is estimated that in 1828 between 600 and 1,000 Chinese were working in the district. But, following a temporary depopulation of the mines caused by Malay attacks, the total population amounted to only 300 in 1830. Newbold, *ibid.*, p.33-34, 56-57, 60-62, 96-100; Begbie, *ibid.*, p.408; Blythe, *ibid.*, p.65.

⁴² Fernor, *Report Upon the Mining Industry*, p.22.

⁴³ The Assistant Resident of Melaka, J.B.Westerhaut, wrote: "In 1833 I opened several mines at Pandoy, Tungmay Bulu and Lendeck in Naning, till 1835 when I left off working. In 1840 I assisted a Chinaman who opened one at Durian Tungul. He made a great profit and was followed by many other of his countrymen". J.B.Westerhaut, "Notes on Malacca" cited in Jackson, *Immigrant Labour*, p.33.

Peninsula Chinese miners had also penetrated into the mining districts on the east coast and were observed in Pahang in 1827 and in Trengganu in 1828.⁴⁴ Chinese monopolised the smelting of tin ores in Ujong Salang, Patani and Kedah.⁴⁵

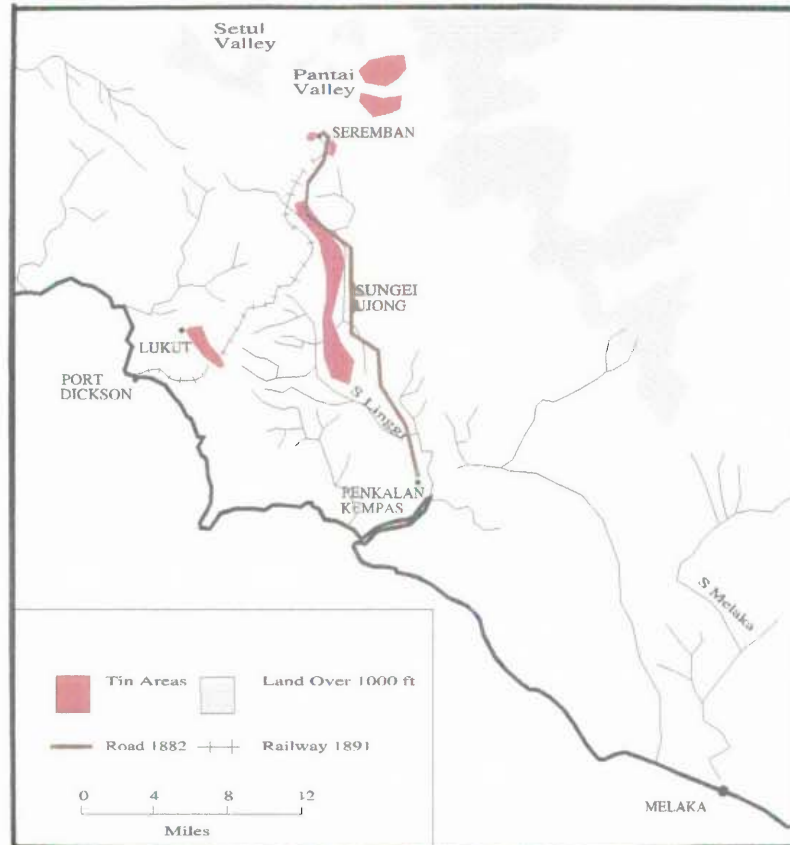


Figure 3. The Lukut and Sungei Ujong Tin-fields

The movement of Chinese miners into the western tin states gained momentum from 1840 and soon developed into Chinese migration on a large scale. The stimulus to this influx was the discovery of rich and extensive ore deposits in Selangor and Perak. In the following

⁴⁴ In 1827 an Englishman named Gray reported the discovery of a tin mine near Lepar in Pahang being worked by 800 Malays and a number of Chinese. Gray, "Journal of a route overland from Malacca to Pahang, across the Malayan Peninsula" *Journal of the Indian Archipelago*, Vol. VI, 1852, p.373 cited in Victor Purcell, *The Chinese in Modern Malaya*, Singapore, Oxford University Press, 1960, p.257. In 1828 it was estimated that the Chinese mining population in Kuala Trengganu totalled 600. See Blythe, "Historical Sketch", p.66; Anderson, *Political and Commercial Considerations*, pp.187, 202; Begbie, *The Malayan Peninsula*, pp.424-25; Newbold, *British Settlements*, II, pp. 60-62; Cant, *An Historical Geography of Pahang*, pp.38-39.

⁴⁵ Anderson, *ibid.*, p.122; Low, "Observations on the Geological Appearances", p.138. Because these areas were under strong Thai influence the actual miners of the ore were thought to have been a mixture of Malays and Thais. Although the Chinese monopolised the smelting of tin it is not certain that they actually worked the mines.

decades increased tin production consisted of an expansion of the existing Chinese communities at Lukut, Melaka and Sungai Ujong as well as their extension into Selangor in the central Malay States, and in the rapid development of mines near Larut from bases in Penang. Penetration into the inland areas was invariably by river as groups of miners followed streams to their sources in search of tin-bearing ground. Much of the capital necessary for the opening up and working of the mines came from wealthy Chinese merchants living in the Straits Settlements. Chinese merchants in Melaka and Penang advanced capital to the Malay chiefs who worked the mines with Chinese labour also often supplied by the merchants. Gradually, both the financial backing for the tin mines and the physical working of the tin deposits moved into the hands of the Chinese.⁴⁶

The first significant discoveries of tin-bearing land were made in the already established mining centre of Lukut. By 1850 so much tin was being produced in the district that "it took the custom's clerk all his time to weigh the ingots before they were shipped in schooners and junks to Malacca".⁴⁷ By 1860 the local chief Raja Juma'at had transformed Lukut into a flourishing mining settlement by encouraging Chinese immigrants to work the deposits.

The success of Raja Juma'at wakened other Malay chiefs to the possibilities of developing tin mining in other parts of Selangor with "imported labour". Shortly after 1844 Raja Abdul-Samad, a nephew of the Sultan, prospected for tin land near the Kanching foothills that were drained by one of the tributaries of the Selangor River. The small number of mines already established at Kanching were transformed into a flourishing centre of production. In 1857 Raja Abdullah bin Tunku Ja'affar, son-in-law of the Sultan, prospected in partnership with his brother Raja Juma'at of Lukut with loans from some Melaka Chinese merchants. The

⁴⁶ The transition from Malay to Chinese monopoly will be discussed in greater detail in Chapter 2.

⁴⁷ Quoted in Jackson, *Immigrant Labour*, p.33.