Malay Mining Methods in Kinta in 1884

by

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Small numbers of both Chinese and Malays were mining tin in the Kinta valley in the eighteenth century, and the numerous small pits scattered around many parts of the valley, which are referred to as “ancient workings” by several late nineteenth century European observers and “lombong siam” locally, provide visible evidence of their activities. In 1885 the Inspector of Mines in Kinta, Mr. A. Hale, noted that “there is evidence that very extensive work has been done here by somebody at a time when the method was different from that which is commonly adopted by the Kinta Malays at the present day. There are at least fifty deep well-like pits on the Lahat hill, averaging about eight feet in diameter and perhaps twenty feet deep”. He observed that as the jungle was cleared extensive old workings were continually brought to light, and “these appear to have been left undisturbed for at least a hundred years”\(^1\).

However, for a long period the rich deposits of tin here failed to attract much attention, chiefly because of the inaccessibility of the area at a time when there were neither railways nor roads, and as late as 1874 there were only about 4,000 Chinese miners, with probably not as many Malays, in the whole valley. It was not until the late 1870s and early 1880s that Chinese miners began to enter the valley in significant numbers, (particularly after the mines at Taiping began to show signs of exhaustion), but once the pioneering was begun thousands poured in to join their countrymen, and the number of Chinese in the area rose from over 5,000 in 1884 to 44,700 in 1889. Large parts of the valley—particularly towards the hillsides, as the central part of the valley was swampy and unsuited to the early Chinese methods of mining—were cleared and worked by the in-coming Chinese miners. Within a very short space of time the Kinta valley became the most important tin-mining area in Malaya and an area of overwhelmingly Chinese settlement. This spectacular expansion of Chinese mining activities has completely overshadowed the fact that Malays continued to mine tin in several parts of the valley, although their share of the total amount of tin produced remained very small\(^2\). It is therefore fortunate that a Frenchman who visited Kinta in 1884 was not only well-qualified to comment upon both the Chinese and Malay mining techniques which he saw employed there, but studied them in detail and published his observations on his return home.

The Frenchman concerned, Mon-sieur Jacques de Morgan, a civil mining engineer and a member of the geographical, geological and zoological societies of France, was in Malaya for several months in 1884, much of his time being spent in Perak. The purpose of his visit was to discover


(2) In 1885 there were about 350 private Malay mines in the Kinta valley these being “mines, claimed by Malays, which have been worked by them and their ancestors for an indefinite period”. There were also a number of “new mines” owned by Malays, (Hale, op. cit., 303.).
in a general way, the watershed between the rivers of Perak in the west, and Patani, Kelantan, Trengganu and Pahang in the east. He also proposed to cross the central mountain range and to descend the Kelantan river to the China Sea, returning thence to Singapore. During his travels de Morgan observed and recorded a great deal of very valuable information, and on his return wrote a considerable number of articles in various French learned journals dealing with many aspects of the Malay Peninsula. These articles include detailed linguistic and ethnological studies of aborigines and informed considerations of the geology and mining industry of the Kinta valley. The following description of Malay mining methods, which he studied during his stay in Kinta in May, June and July, 1884, occurs in an article entitled “Note sur la Géologie et sur l’Industrie Minière du Royaume de Péarak et des pays voisins”, which originally appeared in the Annales des Mines, (March–April, 1886), and was republished in 1886 in Paris as part of a collection of articles, (all except one by de Morgan), dealing with the Malay Peninsula, to which he gave the title “Exploration dans la Presqu’île Malaise (Royaumes de Péarak et de Patani)”.

De Morgan’s Description of Malay Mining Methods in Kinta.

“According to the position of the rich beds, the Malays employ two different methods.

“If the beds are on a hillside, the miner is content to dig a large trench in the mass and to reject into the valley the waste which encumbers him. The lowest level of exploitation is then determined by the maximum height of the water in the valley; a terrace is allowed to develop about a foot above this limit. Nevertheless, seepage occurs in the worked layers which tends to interrupt the work; the Malays also excavate a series of parallel ditches at the front of the trench in order to drain the terrace. It is easy to understand that such a method of working has been applied, from most ancient times, to beds on the sides of all the small valleys. I have also unceasingly encountered in the jungle the remains of workings of this nature, which the Malays attribute to their ancient masters, the Siamese."

“On the other hand, when the workable beds are found at the bottom of a valley, the Malays dig small pits which they work with buckets. Figure 1, (Fig. 17, Pl. X in de Morgan’s book), gives the plan of the Tronong mine in the state in which it was when I studied it in June, 1884. At 0 are the ancient workings on the hillside attributed to the Siamese. At T are two pits in which they were working at the time of my visit. These pits, of which a cross-section is represented by Figure 2, (Figure 16, Pl. X in de Morgan), are cut with a pick-axe in the alluvium; on three sides the Malays prop the earth up with the bark of trees held in place by vertical posts; on the fourth face, the alluvium is allowed to fall away, but in the majority of localities holds long enough to enable them to work it in steps.

(3) The description of Malay mining methods occurs on pages 45 to 51 of the article.

(4) Although these pits are known as “lombong siam”, (i.e. Siamese mine), in many parts of Malaya, it is extremely unlikely that they were, in fact, worked by Siamese, (see Ooi Jin-Bee, “Mining Landscapes of Kinta”, Malayan Journal of Tropical Geography, Vol. 4, 1955, 6.

(5) The Tronong mine lay on the banks between Lahat and Papan, of a small stream on the hillside.
“Depending on the abundance of water, draining takes place every morning before work, or several times a day and even sometimes throughout the duration of the work. It is performed with the aid of buckets suspended from long levers loaded with counterbalances at their ends, (see Fig. 2). Because of the great simplicity of this apparatus drainage is much less laborious when it is done directly in the buckets. However, I know some mines where the method of levers is not used, but in these mines the rich beds are nearly at the surface of the soil. The considerable labour required for drainage forces the workers at the bottom to work with very great speed and those at the surface to throw the spoil as near as possible in order not to waste time. The result is that the spoil always piles up near the working pit, which compels them to move the extracted earth again in order to change their position when wishing to extend the works.

“Washing the ore — The Malays establish sluices in the drainage ditches when seepage is insufficient to allow them to wash the ore with the aid of the water in the mine at only a few metres from the place of extraction.\(^6\).

\(^6\) “The method most commonly used by Malays was sluicing, or lampanning as it was usually called. The ground around the mine was cleared and a ditch cut from the nearest stream. Water was led along this channel to the mine, and the earth containing *karang* was thrown into it. The mixture was stirred so as to break up the lumps of clay and liberate the ore from the other waste material. The larger stones were lifted out in a basket, and the rest of the mixture driven down-stream with a large wooden spade called a *pengayuh*. Small dams were placed in the ditch at intervals to retain the heavier tin-sand, which was then scooped out with a small wooden tray and deposited in a palong, or sluice-box, for partial concentration” (Ooi Jin-Bee, *op. cit.*, 7).

\(^7\) “When the worked beds contain little water, they establish their sluices in the closest stream, and carry the rich tin-bearing earth there. But this laborious work is the reason why much ore of average richness is abandoned as not being worth the transport. I have seen frequent examples of this system between Ipoh and Lahat, and at Campong Monilé. This kampong was located roughly half-way between Lahat and Papan. Its name is preserved on the 1892 map of Perak in the name of the stream “S. Menalai” a tributary of the S. Johan.”
CROSS-SECTION OF MALAY MINING PIT.

P = Levers.
S = Buckets
C = Counterbalances
St = Spoil.

Pile of rich ore.
Humus.
Alluvium.
Beds of tin ore.

Figure 2.
“When the ore is very rich, but water is lacking, the miners divert small streams of water which they lead sometimes from far distant in the mountains so that they can work their mines. It is thus that at Klian Monilé there is a stream of which the waters, captured at a great distance from the mine, cross several valleys on wooden aqueducts, (see Figure 3, Figure 18, Pl. X in de Morgan); they follow the hillside for a distance of about 2 kilometres and come to supply the washers in the mine.

“In general, after leaving the mine, the rich tin-bearing earth is placed beside the stream of discharging water at the surface, or of that provided by drainage; in this way, the ores pass to the sluices the morning after their extraction and are washed by the workers whilst drainage is undertaken, before beginning work. As soon as the water level is sufficiently low, the Malays cease washing and continue extraction. As in this way it often happens that they are unable to wash in the morning all the ore-bearing material extracted the preceding day, it accumulates in a pile which they wash later, — when the rainy season prevents them from working below.

“In Malay mines, the washing is sometimes done in a single operation, but generally it consists of separation and washing properly speaking.

“The separation takes place in a ditch without facing; the ore-bearing material is agitated for some time in the water and the worker only stops this work when the stream has become perfectly clear. The man charged with separation pushes the ore with a shovel or with his feet towards the washing sluice which, generally consists of a tree trunk hollowed out with an axe or simply of bark held in place by small vertical posts. By this method, the ores attain a content which varies between 20 and 30 per cent. of metal.

“The washing in the sluice involves bringing the ore back to the upper part of the apparatus; the Malays stop this washing when the colour of the sand seems to them sufficiently dark; the ore then contains 55 to 65 per cent. metal, but rarely exceeds this figure.

(8) Klian (galian)="digging, surface mine".
"As regards the dimensions of the sluices, they are very variable and depend solely on the importance of the workings. I have seen them 2 metres, 50 in length, (i.e. about 8 ft. 2 ins.), and 0 metres, 40 to 0 metres 50 in width, (i.e. about 16 ins. to 20 ins.); but these large types are exceptional. The average sizes are

length = 1m, 50, (i.e. almost 5 ft.) and width 0m, 30 to 0m, 35, (i.e. 12-14 ins.); the angle of slope is regulated by experience, depending on the size of the grains of cassiterite.

"In many mines washing is concluded by beating; the Malays employ large blades of wood for this purpose which they use with great skill.

"Cost price (extraction, draining, washing)—The same workers do all the work; they do the most fatiguing jobs in shifts, so that it is very difficult to establish the cost price for each of the operations taken separately. The sole way of obtaining an approximate cost price is to consider output in terms of the total number of men employed in a mine.

"Below is a table of the monthly results of work in various mines in Kinta, calculated per worker working thirty days.

<table>
<thead>
<tr>
<th>Mine</th>
<th>Tin Production in pikuls</th>
<th>Tin Production in kilogrammes</th>
<th>Value of metal produced (frances)</th>
<th>Cost of production (frances)</th>
<th>Cost of smelting (frances)</th>
<th>Profits (frances)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kl. Tronong</td>
<td>0.42</td>
<td>26.25</td>
<td>52.60</td>
<td>40</td>
<td>4.20</td>
<td>7.40</td>
</tr>
<tr>
<td>Kl. Monile</td>
<td>0.48</td>
<td>30.00</td>
<td>60.00</td>
<td>40</td>
<td>4.80</td>
<td>15.20</td>
</tr>
<tr>
<td>Kl. Tatsi(9)</td>
<td>0.71</td>
<td>44.37</td>
<td>88.00</td>
<td>40</td>
<td>7.09</td>
<td>40.91</td>
</tr>
<tr>
<td>Kl. Djourang(10)</td>
<td>0.62</td>
<td>38.75</td>
<td>77.00</td>
<td>40</td>
<td>6.17</td>
<td>30.83</td>
</tr>
<tr>
<td>Kl. Salai(11)</td>
<td>0.94</td>
<td>58.75</td>
<td>117.00</td>
<td>40</td>
<td>9.40</td>
<td>67.60</td>
</tr>
<tr>
<td>Kl. Llang(12)</td>
<td>1.00</td>
<td>62.50</td>
<td>125.00</td>
<td>40</td>
<td>10.00</td>
<td>75.00</td>
</tr>
</tbody>
</table>

"These evaluations were made during the months of May, June and July, 1884.

"In the preceding table 1 take the value of a ton of tin at 2,000 francs(13), because it is necessary to take account of duties (about 250 to 280 francs); I take the cost of production at each mine as 40 francs per month per man; this outlay seems to be the average of those made by indigenous miners. Moreover, the Malays have told me very often that when a mine fails to yield $8 to 10(14) of tin per man per month, it is useless to work it.

"Sale of ore — The ore washed and brought to a content of about 65 per cent, is directly negotiable. Small workings, those which do not have a furnace specially constructed for the mine, send their ore to smelters who pay $10 to 12 per pikul for it and deduct a fifth for the cost of metallurgical treatment. We will see later what enormous profits the smelters can realise.

(9) This name appears as "Tatsir" on de Morgan's map. The mine was situated on the south side of the road, (in existence in 1884), from Batu Gajah to Papan, roughly in the vicinity of the present settlement of Pusing.

(10) i.e. Juang, about 8 miles ESE of Ipoh on S. Anak Ayer China.

(11) This mine is not named on de Morgan's map and cannot be located. This is perhaps surprising in view of the fact that it is the second largest producer in the above table.

(12) This mine was located about 1 mile to the NW of Gopeng in the vicinity of Kampang Llang, roughly half-way along the road from Gopeng to New Kopisan.

(13) "The actual price of tin (October, 1885) exceeded 2,300 francs per ton, but the Malays never obtain a level so remunerative for their product". (footnote pp.49-50, de Morgan).

(14) "The value of the dollar varies from 4f. 60 to 4f. 80 according to the rate of exchange", (footnote p.50, de Morgan).
“When selling the ore, the Malays measure the powder, but do not weigh it; for this purpose they use half a coconut which they fill to the brim, the smelter takes five coconuts and only counts them four. Moreover the tampouron (half coconut)\(^{(15)}\) which serves for these measures is gauged in advance.

“In Malay workings of some importance, the labourers who work at the mine for the whole dry season become smelters during the rainy season; their profits are then much greater.

“The miners themselves transport their ore and their smelted tin, either they carry it on the backs of men, on the backs of elephants or in sampans. They sell it in the commercial centres such as Thaiping, Kouala Kangsar, Ipoh, Batou Gadja, Goping or Telok Anson, but I have never heard tell that Malay miners go to Poulao Pinang or to Singapour”.

\(^{(15)}\) têmpurong = half coconut shell.