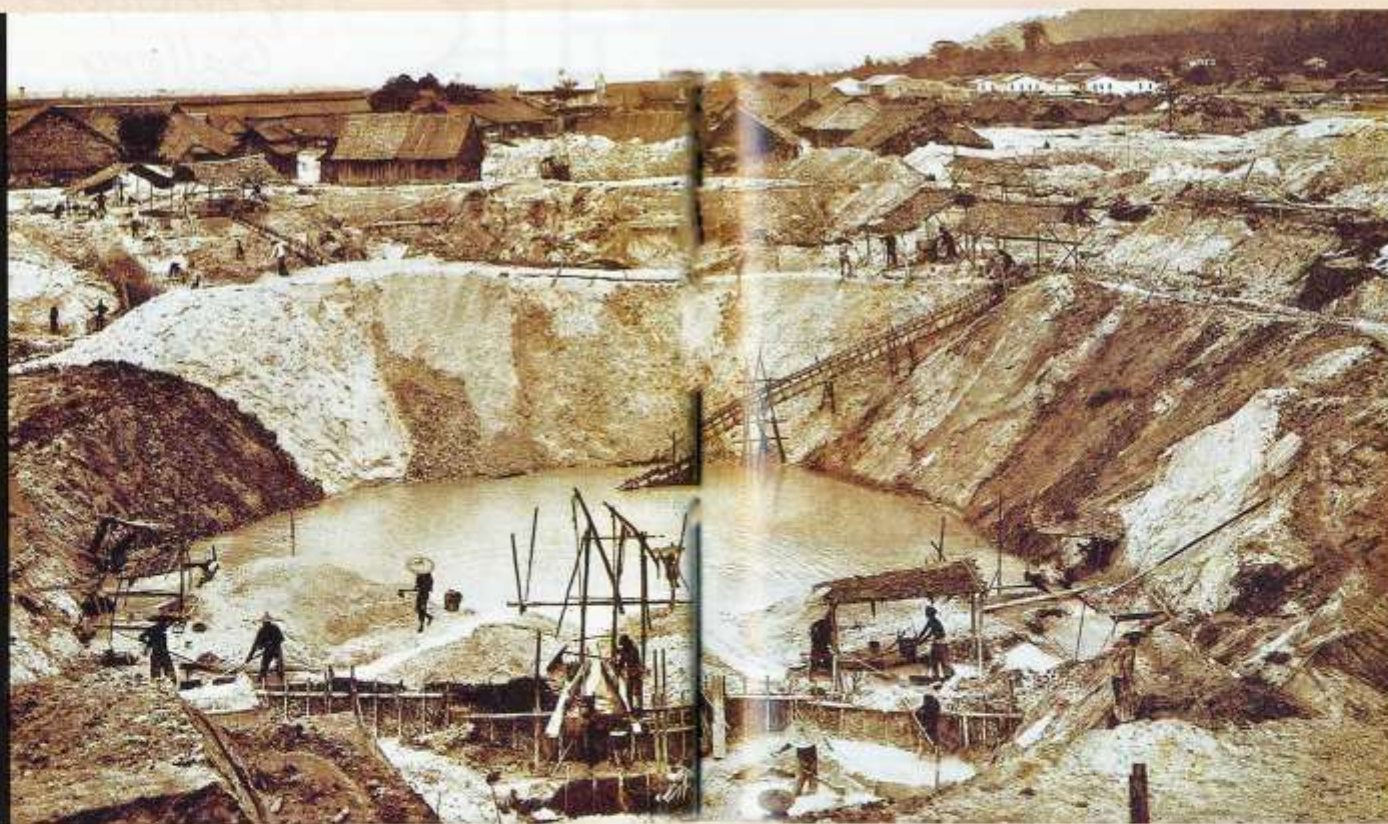


Deaths in the Mines

On the Trail of a Killer Disease

by Dr Ho Tak Ming



A disease that killed thousands in Malaya in the latter half of the 19th century baffled early doctors and medical scientists for a long time. Later called beri-beri, a Sinhalese word meaning "weakness", it struck particularly hard where large numbers of people were confined together such as in work camps. Those afflicted displayed swelling of the legs, muscle weakness, difficulty in walking, paralysis, shortness of breath, and heart failure. Many died, but of those who did not,

many became permanently disabled, debilitated, and ending up as vagrants.

A PATTERN IN OCCURRENCE OF THE DISEASE

Beri-beri afflicted all local communities who were fed on rice. Those who were not rice eaters such as the "Bengalis" (Sikhs, Punjabis, Pathans) who ate chapatti made of wheat, or Europeans and Eurasians, who ate bread, escaped. There was a marked disparity in the incidence of the disease among the

different rice-eating communities. Beri-beri was rare among rural kampung Malays and only affected those who were away from home for long periods, such as on jungle expeditions or pearling fleets or among those in the employ of Chinese who were paid, in addition to cash, a generous allowance of rice. The indentured Tamil labourers working in sugar cane and coffee estates were immune almost to a man although they succumbed in large numbers to other sickness such as

malaria, dysentery and tropical ulcers.

It was among the Chinese that beri-beri was most prevalent, accounting for 96 per cent of cases, devastating especially the *sinkhehs* or newly arrived immigrants. The old hands or *laukhehs*, fared better. These *sinkhehs* were able-bodied young men when they arrived. From the parts of China where they came from, beri-beri was uncommon.

There was a pattern in the occurrence of the disease. Whenever there was gathered a large body of Chinese coolies

the disease broke out within six months, wiping out as much as 90 per cent of the work force. Doctors investigating these outbreaks began to talk of "place infection" or "new foci of infection". It was in the tin mines that the disease was most virulent. The death rate of the miners was four times that of all other occupations.

In the Straits Settlements and Federated Malay States during the 1880s and 1890s, in a population of one and a quarter million there were over 150,000

cases of beri-beri that were treated in the government hospitals and clinics alone. The mortality rate was 20 per cent. As only one-third of Chinese died in hospital, the total deaths from beri-beri during this period would have been 100,000. Annually, out of every 1,000 Chinese, 120 suffered from it in some degree, 80 being severely affected, while 16 died of it.

OFFICIALS AND DOCTORS BAFFLED

Hugh Low, the British Resident of Perak from 1877 to 1889, was appalled by the high death rate of the miners in Larut. He built the first modern hospital in Taiping in 1878 for them, and levied a capitation tax of one dollar per head on all Chinese in the state to support the hospital. He thought that it was "the cold winds which nightly descend from the mountains" which caused the malady. His successor, Frank Swettenham, believed that it was the harsh, enervating climate and hard work that killed most of the miners except the fittest. The British doctors thought beri-beri was either an infection or else was caused by noxious fumes that emanated from the soil whenever it was turned over for mining or planting. They were all wrong but the answer was not to come until the early 20th century.

WHITE POLISHED RICE AS A CAUSE

It turned out that it was the diet that was responsible for beri-beri. For the first time in their lives, the newly-arrived Chinese coolies were introduced to white, polished rice. Day in and day out, they ate a diet of white polished rice, salt fish, salted eggs, a few black beans, and just once a week, a small portion of fat

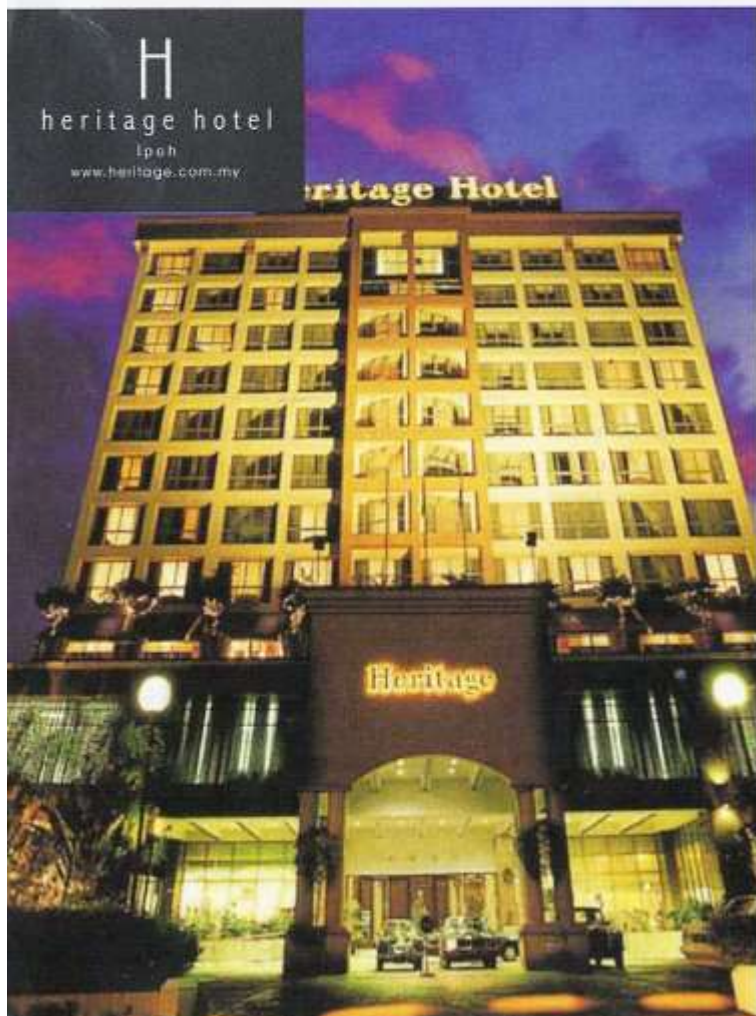
Batu Gajah: Former Colonial Centre



Batu Gajah courthouse built in 1892: The British headquarters of the Kinta region was moved to this town, 20km from Ipoh, in 1884

headquarters of the British in Kinta was Kota Bharu, the lowest landing stage on the Kinta River, and also the river port for the important mining centre of Gopeng. However, Kota Bharu was so malarial that it had to be abandoned, and in 1884 the capital was shifted to Batu Gajah, the next landing stage. This coincided with the Kinta Tin Rush, making it an important station, as all applications for land for mining and agriculture had to go through the Kinta Land Office in Batu Gajah.

Batu Gajah was a small town situated on the banks of the Kinta River. There were rows of Malay huts on both sides of the river, while the Chinese sector was on River Road, which later came to be called Old Town. Batu Gajah was the river port for Papan, then the most important mining centre of Kinta. Large tongkangs and cargo boats used to berth regularly beside its jetty, bringing provisions for the miners, and transporting tin down to the coast. Before roads and railways were built, the rivers were the most important means of transport. The first



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St. Joseph's Church



The European Hospital, Batu Gajah, with St. Joseph's Church in the background

pork. Rice formed 90 per cent of the rations. But that hardly bothered the coolies as long as they could stuff themselves with rice to give a feeling of satiety and to supply the energy for their back-breaking tasks.

Milling of rice in steam-powered rice mills had been introduced by the British in Burma in the early 1860s, and had come to Siam (Thailand) soon after. Both countries became granaries for Malaya, which could produce enough rice for only its native Malay population but not for the large numbers of immigrant Chinese coolies. The indentured Tamil coolies ate parboiled rice, which had been a tradition of south India for centuries.

Mechanical milling of rice removes most of the B1 vitamin or thiamine from the outer part of the rice grain or pericarp. The lack of B1 vitamins in such a staple grain was the main cause of the deficiency disease beri-beri. The disease was avoided if there was thiamine supplied by other items in the diet such as fresh fruit, vegetables, whole grains and seeds or nuts. In 19th century Malaya such food items were not readily



Jean Francois Allard: Started a large settled vegetable-farming community

available in most of the mines. The mines were generally far from the towns. Vegetable gardening was still new, and supplies were limited to the main markets.

VEGETABLE FARMS AMONG THE MINES

Remarkably, there was one place in Kinta, Perak which, beginning from the early 1880s, was supplying an abundance of fresh produce daily at low prices to

the numerous mines in its vicinity. Unknowingly then this supply of fresh vegetables helped prevent large scale beri-beri among the miners in the area.

The story of how there came to be a large settled community of early vegetable gardeners in a tin mining region began when in 1875 the Vicar Apostolic of Malaya and Singapore, Bishop Le Turdu, sent Father Jean Francois Allard of the Societe des Missions Etrangeres de Paris (MEP) to Taiping to open the first Catholic Mission in Perak. Fr. Allard, who had earlier worked with Chinese Christians in Malacca and Province Wellesley, built a wooden chapel on top of a hill and founded the Parish of Our Lady of Sacred Heart. The Chinese farmers who had followed him from Province Wellesley started to cultivate the land around the church. But the land was unsuitable for farming and most of the farmers went over to the Kinta Valley, which was being rapidly opened up following the discovery of tin.

After five years, Fr. Allard was called back to Penang to recuperate. He was so worn out and exhausted that his superiors feared for his health. He soon

	Total Treated		Total Deaths		Percentage of Deaths	
	1893	1894	1893	1894	1893	1894
Batu Gajah	1,071	818	112	114	10.45	13.93
Gopeng	764	588	72	116	9.43	19.72
Ipoh	1,319	1,460	182	302	13.78	20.68



Batu Gajah hospital complex: Hospital records show that percentage of deaths from beri-beri at Batu Gajah was lower than Larut, Kuala Kangsar, Teluk Anson, Tapah and Selama

recovered and in 1882 he asked to be sent to Batu Gajah in Kinta where a number of his former parishioners had settled.

In Batu Gajah Fr. Allard founded the Parish of St. Joseph. He cleared the hill at Changkat and built his chapel there in 1885. His small parish at first numbered 250 members, but by 1887 it had reached 400.

Aside from his pastoral work Fr. Allard became a farmer just like his parishioners "with hens, vegetables and fruit trees". He was so busy that for months at a time, the Church had no communication with him, and thought he had "disappeared". At first the parishioners were squatters but later Fr. Allard helped them to apply for agricultural land. The District Collector and Magistrate, JBM Leech, took an interest in this colony of Christian farmers, and charted their progress in his reports in the Perak Government Gazette.

As the parish grew, the farmers took up land beyond Changkat to extend to Rotan Dahan and other parts of the district. They were encouraged in their enterprise because the soil around Batu Gajah was very fertile.

SUCCESS AGAINST BERI-BERI

From Batu Bajah, fresh vegetables were supplied to the mines. The health benefits soon became evident. There were three district hospitals in the Kinta region in 1889. These were in Batu Gajah, Gopeng and Ipoh, and they all served a mainly mining population. Up to 1891, over 90 per cent of the cases treated in these Kinta hospitals were beri-beri.

The Perak Government Gazette 1895 provided a comparative table of beri-beri cases for the years 1893 and 1894 in the three district hospitals.

The highest number treated (1,460),

and also the most deaths were at the Ipoh hospital. On the other hand, the percentage of deaths at Batu Gajah (average 12.19 per cent) was less and comparable to an agricultural district like Parit Buntar (average 9.85 per cent), and lower than all the other districts like Larut (average 18.75 per cent), Kuala Kangsar (average 21.17 per cent), Teluk Anson (average 13.48 per cent), Tapah (average 20.98 per cent) and Selama (average 21.96 per cent).

Fr. Allard's parish continued to expand. His original little chapel had been blown away by a storm, and even the new one he built was not sufficient for the needs of his congregation. A new chapel was built and consecrated by the Bishop on 29 June 1891. The church membership steadily increased until it exceeded a thousand. However, all these apostolic activities took a toll on Fr. Allard's health. In 1892 he had to leave his parish in Batu Gajah for a sanatorium in Hong Kong. He died in 1898.

Eventually with the discovery of tin in the vicinity, agricultural land was taken over by the miners. In 1902, the *Perak Pioneer* reported the end of the Batu Gajah vegetable farms. But by then plentiful vegetables were imported from Penang. And beri-beri as a disease was successfully dealt with.

Dr Ho Tak Ming has his own medical practice in Ipoh but he is also a heritage enthusiast. Dr Ho has written several books including Doctors Extraordinaire, Doctors in the East, and Generations: The Story of Batu Gajah.

The Doctor who almost Discovered Vitamins

Until the early twentieth century, most medical scientists believed that beri-beri was caused by a microbe. Even Sir Patrick Manson, the Father of Tropical Medicine, subscribed to this theory. It was Dr. W. Leonard Braddon, the State Surgeon of Negri Sembilan, who suspected that beri-beri was caused by eating a certain type of rice, polished or "uncured" rice. Dr. Braddon had been studying the disease since 1889 when he came to Selangor as District Surgeon. He published a book in 1907 called *The Cause and Prevention of Beri-beri* in which he stated firstly that "Every beri-beri case in the East is a rice-eater" and secondly that "Persons who do not eat rice do not get beri-beri."

But he thought that it was a poison or "toxin" in polished rice that caused the disease. This toxin was not preformed in fresh rice, but acquired when the rice was exposed to moisture during milling, storage or transit, or when it became stale. The disease was preventable by eating "cured" rice, like Indian parboiled rice, which was first soaked, then boiled, thus killing any fungus growth if the rice were diseased.

Dr. Braddon fed his beri-beri patients parboiled rice, with encouraging results. In 1907, the Institute for Medical Research decided to test his theory by performing the famous Durian Tipus experiment. A party of 300 Javanese engaged in road construction in a remote area of Negri Sembilan was divided into two groups – one group fed on white rice, and the other on parboiled rice. The result proved conclusively that beri-beri was closely associated with white rice. However, the IMR doctors could not isolate Dr. Braddon's

"poison", and came to the conclusion that white polished rice lacked something of high physiological importance for the maintenance of health and correctly identified beri-beri as a deficiency disease. This essential nutritional component of rice removed by mechanical milling was called "vitamine" by Casimir Funk in 1911. In 1912, Funk and Hopkins listed a class of deficiency diseases, which include scurvy and beri-beri as being

caused by lack of what are now called vitamins.

In 1911 the Federated Malay States Government prohibited the use of white polished rice in all government institutions, thereby reducing cases of beri-beri in these places. It also distributed pamphlets in English and Chinese and placed advertisements in Chinese newspapers warning of the danger of eating white rice and

encouraging early hospital treatment of beri-beri. By the late 1910's the worst of the disease in Malaya was over, thanks to the pioneering efforts of Dr. W. Leonard Braddon.

However, Dr. Braddon did not receive any recognition from the scientific world. His "grain-intoxication" theory was proved incorrect. In 1929 Sir Frederick Gowland Hopkins of Cambridge together with Christiaan Eijkman, a researcher from the Dutch East Indies, were awarded the Nobel Prize for Medicine "for the discovery of vitamins".

Dr. Braddon resigned from Government service in 1908 and became a planter. He was a very disappointed man in his old age for he certainly came close to being the first to discover vitamins.



Chinese opencast mine near Taiping: Chinese mines ate mainly rice and "every beri-beri case in the East is a rice-eater"