

# Java's Quinine Industry and Its Commercial Importance

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**B**ANDONG, Java, Aug. 15.—(Special Correspondence of The Bee.)—The United States government should investigate the possibilities of cinchona plantations in the Philippine Islands. The climate and soil there are about the same as those of Java, and the Dutch are making fortunes out of the business. They began to plant trees only a few years ago and they are now producing more than four-fifths of all the quinine and cinchona bark used in the world. Last year's crop amounted to more than 12,000,000 pounds of quinine alone, and the output is steadily increasing. The demand is also increasing and the plantations promise to be more and more profitable in years to come. At present they are paying from 30 to 40 per cent dividends and are, I am told, all doing well.

The cinchona plantations of Java are managed by the government, by syndicates and by individuals. The syndicates have the most trees. They have eighty-three great estates which are bringing in altogether about \$4,000,000 a year. The most of these estates are on lands leased from the government for terms of seventy-five years. The planters agree to make certain developments and to pay certain rents in lieu of taxes, and they have to carry on their work after the rules laid down by the government. The private plantations are managed to some extent the same way. They are well cared for and three of them each yield about 300,000 pounds of quinine annually.

The government plantations are conducted more with regard to the study of the cinchona tree and the extraction of the quinine from its bark than for profit, although I believe they pay. They are now raising about 700,000 pounds of quinine a year and in addition to this are supplying all the quinine needed for the Dutch army and navy.

## Where Quinine Originated.

But before I describe the government experiments let me tell you something about the tree whose bark supplies the little pill that takes away the fever. The cinchona tree comes originally from the eastern side of the Andes. There is a strip of country about 100 miles wide and over 2,000 miles long, running along the slopes of those mountains from Venezuela as far south as lower Bolivia, which is spotted with quinine groves. The trees are far in the interior and hard to reach. I saw something of them during my travels in South America in 1898. The bark is cut in the forests and hauled for many miles on the



PREPARING QUININE BARK FOR THE FACTORY.

trucks first in the botanical garden at Buitenzorg and afterward here at Bandong and elsewhere. They experimented for some time and finally discovered that the best tree for them was the red-bark cinchona tree, which grows to double the thickness of a man's body and to a height of about fifty feet. In 1869 they had only 7,000 of these trees. They have now many millions. The Java trees are of exactly the same variety as those used in India, but the planters here tell me that the Java bark produces far more quinine than the India bark and that the trees yield differently according to soil and climate.

This letter is written at Bandong, in the center of the best quinine-producing region

on the government plantations there are single trees which will yield as much as \$64 worth of quinine. At this rate a thousand would yield \$64,000, the greatest profit per acre perhaps of any crop known. Even though it required ten years to grow the whole crop this would be equal to \$8,400 per acre per year. Divide this by four and you would still do well. You would have \$1,600 per acre, which is by no means a bad yield in these days of 4 per cent interest and 70-cent wheat.

The biggest quinine factory of the world is situated in this city of Bandong. It is under government supervision, but is run as a private enterprise in the interests of the planters, although I believe they have no stock in it. The factory does not buy the cinchona bark. It merely takes toll for its work. The bark is delivered in bales of 200 pounds each. These are carefully analyzed by the government chemists to find the percentage of quinine which each bale contains. After this the planter gets a check for the value of the bark less the toll, and the bark is now thrown in with the other bark in the warehouse. I went with Dr. Van Linge through the different branches of the factory watching the processes of reducing the bark to quinine. As it comes from the tree it looks not unlike ordinary bark, but when you taste it it is like biting into a pill. Much of it comes to the factory in dust, and it is all reduced to dust before it is carried into the mill.

## Bolted in Kerosene Oil.

The dust looks like cinnamon ground fine. It is reddish brown, but each brown grain incloses some of the white atoms we know as quinine. The process is to get the white atoms out. This is done by mixing the dust with water and boiling it in mineral oils. The boiling is done in great vats of steel, in which a sort of kerosene refuse is put.

There are steam pipes running through the vats, which keep the oil just at the boiling point, or at almost 200 degrees Fahrenheit. At this point the dust is dissolved and the quinine atoms separate from it and go into the oil, being soaked up as water soaks up salt. After twenty hours all the quinine has left the dust and become a part of the oil, while the residue sinks to the bottom.

The oil is now drawn off into other vats, where it settles. It now looks for all the world like clear water. It is really kerosene oil soaked with quinine. The next thing is to get the quinine out. This is done by introducing sulphuric acid and water. The acid takes up the oil, but rejects the quinine and when the oil and acid are drawn off the bottom of the vat has a sediment of dirty white sand. This is crude quinine. It is clarified or refined much as we refine sugar and at the end comes out in the frosted silver, flaky powder known as pure quinine. It is now packed into tins of 100 ounces and thus shipped to New York, Amsterdam, London and the other great drug markets of the world.

Dr. Van Linge tells me that 85 per cent of all the world's quinine comes from Java and that 65 per cent of this is from the neighborhood of Bandong. He says that a large amount of that made here goes to the United States and that the demand from there steadily increases.

Our government might easily set out plantations in the island of Mindanao. That island is almost as large as Java. It has some of the richest soil of the tropics and contains mountainous regions not unlike Preanger. If the secretary of agriculture should establish an experimental cinchona estate in the mountains near Zamboanga or Davao the matter could be easily tested and it might result in exports of enormous value.

At present something like 16,000,000 pounds of quinine are used in the world every year. This is about 9,000,000,000

grains, or enough to give every man, woman child three two-grain pills, an amount which is manifestly not enough to counteract the malaria and the mosquito's. An allowance of one dozen pills per person would quadruple the demand, requiring a product of 36,000,000,000 grains, or enough to build up quinine fortunes in every part of the Philippine Islands.

## Mosquitoes and Malaria.

The scientists here are inclined to the belief now current at home that the mosquitoes communicate malaria. They tell me certain kinds of mosquitoes are full of malarial parasites, germs so small that it takes a billion of them to give a man a bad case of fever, and a quarter of a billion to produce a chill. These parasites breed so rapidly, however, that a few hours, or at most a few days, after being bitten by the mosquitoes the man is full of them and he soon comes down with malaria. The only thing poisonous to the parasites so far discovered is quinine. This kills them, the blood throws off the organism and the man grows well again. I came near dying while in Ecuador not long ago from the bites of such mosquitoes. I had gone up to the foot of the Andes through a vast tract of flooded country which swarmed with malarial mosquitoes. I rode about for two days in a canoe through the tops of the trees being bitten by the insects, and upon my return to Guayaquil was taken down with a bad case of pernicious, something like the Chagres fever. I had a native doctor who gave me from thirty to sixty grains of quinine at a time and the quinine I believe killed the organisms and saved my life. Later on I met in Argentina one of our consuls, a Dr. Ayres, who has been stationed for some years in the city of Para, at the mouth of the malarial Amazon. I told him of my experience with the fever and also that I was going up the Amazon. He thereupon warned me to saturate myself with quinine before I got there, saying that the fever germs could not live in cells which contain quinine. I did so, and though I traveled 2,000 miles among the mosquitoes of the Amazon I had no sign of malaria.

## Chat with Resident Governor.

During my stay here I have called upon the resident governor of the Preanger provinces, Lord Van Bethem van den Berg. This man is one of the ablest of the officials in the Dutch East Indies and he has one of the most responsible positions of this island. The provinces over which he rules are exceedingly rich and he has many millions of natives under him. He has a magnificent home here surrounded by palms and other tropical trees and it was in it that he received me when I presented my letters from the governor general. He speaks English fluently and we chatted for some time about Java.

Among other things I asked Lord Van Bethem van den Berg something as to the land system of the country. He said:

"The lands here nominally belong to the government and we really have control of most of them. We take charge of them to hold them for the natives in case the population increases so that we need them to feed the people. We will then dispose of them to small proprietors or in some way give them to the people. We believe it is our duty to take care of Java so that it will support the natives and to do this we must keep the title to the lands out of the hands of speculators and especially of the Chinese. The Chinese are anxious to get the lands and once in their possession they work them solely for their own benefit, disregarding that of the people. They do not care if the natives are impoverished. They will establish stores on their lands

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THE QUININE FACTORY AT BANDONG.

backs of donkeys to the rivers or the seaports. I saw a great deal of it at La Paz, where it was brought to be shipped by stage or rail to the coast. A donkey load weighed from 100 to 200 pounds and \$32 worth was about all one donkey could carry. One of the Bolivians offered to sell me a forest of 800,000 trees for \$64,000, or 8 cents a tree, and others of whom I inquired told me they had experimented in working the plantations and lost. Some years ago there was quite a craze at La Paz for such speculation. The cinchona or Peruvian bark was then selling for about 2 cents a pound, or for thirty times as much as it is bringing there now. A number of plantations were set out and about \$3,000,000 was invested in them by La Pazites alone. Then quinine fell, and now it hardly pays to cut the bark from the wild trees, although the conditions in Java and the Philippines are such that the trees could be raised there at a profit.

## From the Andes to Java.

Until within comparatively few years it was supposed that the quinine tree would grow only on the Andes. The South Americans thought they had the monopoly of the business. The various governments taxed all exports of the bark. It was all shipped to London, where it was handled by a trust, which raised and lowered quinine prices at will. Then the English government decided to introduce the trees into Ceylon and India and the Holland government planned similar experiments for Java.

Both countries sent scientists to Peru and Bolivia for seeds and plants. The natives there got track of the matter and impeded their mission in every possible way. The Peruvian custom house officers would not let the English specimens leave the country for weeks and in the meantime one of the Bolivians poured some boiling water over the seeds. After a time, however, both seeds and plants were secured for Ceylon and Java. The English set out large plantations in Ceylon and also about Madras. They chose about the same latitude and climates as those in which the South American trees thrive and succeeded in producing trees which yielded a fair quantity of quinine.

The Japanese government set out its

of the world. It is situated in a basin in the Preanger, or mountainous region of western Java, surrounded by quinine plantations. It has also the government factory where the bark is reduced to that bitter powder which kills the malaria. The plantations are in the mountains at about 3,000 or 4,000 feet above sea level. You see their rich, red color spotting the hills as you ride about and in places you may see the natives taking up the trees or stripping off the bark. The soil here is very rich and there are frequent rains all the year around.

I am surprised at the scientific methods which prevail in the cultivation of the quinine estates. I have discussed them with the planters and also with Dr. A. R. Van Linge, the director of the factory. They all tell me that the trees must be planted just so and the greatest care taken to enrich the soil. Oil cakes and especially castor oil cakes are used as manure. The ground is carefully cultivated and the plants are set out according to the methods which the government experiments have proved best.

The plants are raised from the seeds, which are sown in seed beds. The seeds are much like flaxseed, so small that one ounce of them will produce about 20,000 plants. After the sprouts have grown about four inches high they are transplanted and later on transplanted again into the places where they are to stay.

At first the trees were set out wide apart, but now they are planted at every three or four feet, and as they grow alternate trees are cut out from year to year to give the others more room. The bark of those cut out is used, so that the plantation begins to produce something within a short time. The first cutting is at about the third year, and the cutting continues until the tenth year, when the trees are full grown. In taking out the trees both the roots and branches are saved, for they both yield quinine, although the best quinine comes from the bark of the stem. The bark is dried in the sun or in evaporators and then packed up and sent to the factory to be made into quinine.

Dr. Van Linge tells me that about a thousand trees are planted to the acre and that



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