

JAVA'S SPECTACULAR RAILROAD SYSTEM

QUEER FEATURES OF TRAVEL AND WORK IN CHIEF OF THE DUTCH EAST INDIAN POSSESSION—BAREFOOTED CONDUCTORS, CABMEN AND PORTERS IN THE RICE FIELDS AT HARVEST TIME.

(Copyright, 1907, by Frank G. Carpenter.)

MAOS, Java, May 15.—Railways in Java? Yes, hundreds of them. I have just crossed the island on a trunk line as long as from Boston to Pittsburgh, and I write these notes at the station of Maos, about half-way between Soerabaya and Batavia. The Dutch of the East Indies have 30 times as much railroad as we have in the Philippines. Their roads are the best of their kind, and, although they are almost on the equator—that red-hot belt about Mother Earth's waist—they are built to stay. This is one of the most mountainous lands in the world, where it never rains but it pours; but, nevertheless, the roads and embankments are such that they withstand the tropical torments. In many places the banks are walled with stones, and in others they are criss-crossed by lines of stones two feet wide. There are many culverts and also stone drains, plastered and white-washed so that they form white lines running down the green banks.

This is irrigated land. For thousands of years before the Dutch came the Javanese had terraced the mountains and carried the water in aqueducts from one hill to the other. In building the railroads the irrigation system had to be preserved, and in places the water is now carried high over the tracks. Sometimes there are waterways above and below the roads, and not infrequently you pass a great tank in which the water is syphoned from one side of the track to the other.

Model Railway Beds.

One of the railroad difficulties here is keeping down the vegetation. The road-beds must be kept perfectly clean, and the grass on the embankments is shaved like a lawn. The tracks are ballasted with rock, and the ballast is protected by little walls of cobblestones four inches high, which form a gutter outside the line.

Not only the trunk lines, but also the tramways, are well built. There are a number of steam tramways now being constructed, and many are doing quite well. I went over the one from Djokja to Magelang a short time ago with its civil engineer. This was Mr. J. F. Van Benthien van den Berg, a young man who was educated at the Lehigh University, and who graduated there in 1895. He is a relative of Lord Van Benthien van den Berg, the Dutch resident Governor at Bandung.

His road is about 45 miles long, and it pays on account of the heavy shipments of tobacco and sugar from the plantations through which it runs. The train is built on high embankments throughout most of its course. It has some steep grades, and it is crossed above and below by drains and artificial waterways. I was interested in the protection of the bridges by huge crates made of bamboo filled with stones.

If you will imagine a bamboo basket as big as a railroad car, filled with boulders of various sizes, thrown into a stream above a bridge to break the flood, you may get an idea of such protection. Baskets of this kind are of all sizes. They are used to hold up the embankments and to prevent washings and to strengthen all sorts of waterways.

The stations are better kept here than in the United States. They are well built, being made of stone and stucco, covered with whitewash and roofed with tiles. Every station has a home for the station-master. It has a lawn and garden about it, and palm trees and tropical flowers. Many of the stations have postoffices connected with them, and all have telegraph offices and telephones. The ticket agents are often Chinese. They are the cashiers of the country, and handle the greater part of the change.

The cars are first, second and third-class, the natives generally taking the latter. The fares are low, and the third-class tickets make up the largest part of the receipts of the road, which amount to about \$6,000,000 a year.

Every large station has its first and second-class waiting-rooms, and each has a restaurant where you can get a fair meal for from 50 to 75 cents. Before you reach the meal stations the conductor telegraphs ahead and orders your dinner, or you can have him telegraph for a dinner to be brought to you on the train. Such meals are served in sets of porcelain boxes, which rest one over the other, a half dozen boxes comprising an ordinary train luncheon. Each box contains some hot soup, meat or a vegetable, and then with fruit, form the menu. A servant brings the food into the train and waits upon you while you eat, leaving you at the next station, and back on another train with the dishes.

My ticket from Batavia to Soerabaya cost

me 20 guildens, an average of about 35 cents per mile. This was first-class. Had I taken second class I could have gone for 3 cents and third class for six-tenths of a cent a mile. I had a servant with me and I sent him third class. I paid extra baggage on all over 66 pounds, at the rate of 3 cents a pound, and my baggage cost almost as much as my ticket.

Let me give you a picture of the first-class compartment which I had from Soerabaya to Maos. It was about as wide as our cars at home, but not more than 10 feet in length. It was, in fact, a little room about 6x10, walled with glass at the sides and entered by a door at the rear. It had four seats at the corners and two arm chairs of mahogany and wicker. The compartment contained also a leather sofa which could be put up or down at will, and a table a foot wide and four feet long, upon which we ate our lunch.

My fellow passengers were four portly Dutchmen clad in white duck. One of them monopolized the sofa, lying there on his back, his fat abdomen shaking like jelly under its expense of white linen. The other three Dutchmen were smoking and chatting. They spoke English and I found them good fellows. The compartment beyond this was for the second-class passengers. Here were half a dozen Chinese dressed in white duck, all gorgeous with rings and scarfpins. Each had a black queue, in which was braided red silk, tucked inside his jacket. All had gold watch chains and carried canes. There were also some of the poorer Dutch, including a couple of women, who wore sarongs and slippers in Javanese style, and a pretty girl with

beautiful eyes and a ravishing smile and a face so dark that you could tell she had native blood in her. The third-class cars had plain wooden benches. They were crowded with natives, women and men, packed in as close as sardines.

From time to time the conductor came in for the tickets. He moved about like a ghost, opening the door without noise. He was in his bare feet, and as he walked he made no sound. His costume was a calico sarong or bag, which reached from his waist to his ankles, a navy-blue jacket and a turban over which he wore a cap. He put his hand to his forehead as he entered our car, and again raised it in salutation as he examined each ticket.

There were barefooted porters at every station, and barefooted cabmen ready to drive us to our hotel. Their charge is equal to 20 cents of our money. Some of the porters carried a basket on their heads. There were no newboys on the trains, and nothing was sold while the cars were in motion. The latest Dutch dailies are to be had at the stations, and they are also on file in every depot reading-room. My trip across the island has given me a good idea of the country. I cannot describe its beauties. There is no land like it on the face of the globe. I have visited the picturesque parts of India and the Valley of the Nile in the West, and everything is the greenest of green, but I never have seen anything like Java.

If you will imagine a garden as big as the State of New York and as beautifully kept as Central Park, you might

have a faint idea of it. But you must add volcanic mountains, green to their tops, which are lost in the clouds; you must put in feathery bamboos, groves of coconuts, orchards of bananas and vast meadows on which buffaloes and ponies are feeding.

You must terrace the hills with rice fields, some covered with the golden grain ready for harvest and others with emerald sprouts on the silvery face of the waters. Now one of the mountains has 15,000 steps of this nature, and now you shoot out of the rice into great tea plantations, into groves of red quinine and on into woods as blue as the Blue Ridge of Virginia.

Among the banana trees are little bamboo play-houses, the homes of the natives. You cross magnificent roads spotted with coolies, bare to the waist, trotting along with baskets fastened to the ends of poles which rest on their shoulders. Some of the poles have ends turned up like bows. The bare men who are carrying rice in from the fields. Other men have loads of goods which they are taking from one town to another. There are women thus loaded as well as the men, and near Djokja I saw hundreds of young girls carrying burdens in bags on their backs.

I have spoken of the railroad stations being white. Indeed, all Java is of the whitest of whites, and the greenest of greens. The Dutch go wild over white-wash, not only in Holland, but all over the world. Everything they have built here is coated with newly slaked lime. The villas of the cities are dead, white, with columns in front of them the color

of Parian marble. The bridges are white, the fences along the roads, whether they be made of bamboo fishing poles or of heavier wood, are covered with white-wash, and the same may be said of the drains and the culverts, the warehouses, the factories, and especially the vast sugar factories, which cover acres, and which have white smokestacks leaning out in snowy purity against the blue sky.

White, indeed, is so much the fashion that the people whitewash as we clean house—a new coat is put on everything once and often twice every year. The rainy season covers everything with damp and mold. After it is over, the small of lime fills the air, for everything is then coated inside and out, and the buildings put on their white Summer dress. Some of the hotels keep whitewashers busy all the year round, as do also the larger property-owners. The white even extends to the clothing of the foreigners. The Dutch officials dress in white duck. They wear white canvas shoes and white helmets, and even the military officers wear white.

The chief crop of Java is rice. In my trip across the island I have never been out of sight of rice fields. The rice grows on every hill-side and in every valley. It must have water, and the irrigation works which have been built to supply this are unequalled in any part of the world. The soil of Java is a volcanic mud. "It is as rich as guano. It is of such a nature that it can easily be made into walls which will hold back the flooded patches. The larger canals are stone-walled and well-built with many locks, but the water drips from field to field, as the little mud embankments are opened by the people.

In many places I saw the people at work. Here they were planting and there harvesting the rice. The hands are plowed and weeded by the men, but the planting and reaping are done by the women. The rice is set out, plant by plant, in the flooded fields, the women wading through the mud up to their knees as they plant. Much of the farming is on shares, a man and his wife agreeing to plant and harvest a patch for one-fifth of the crop. Sometimes a number of people will join together and take several rice fields. I saw crowds in the ripe grain, the men

and women working together, and especially the young men and young women. I am told that harvesting time is the chief courting time, and that the boys and their sweethearts usually become engaged while cutting rice. The work is not at all hard, for each stalk of rice is cut separately with a little knife which is held in the fingers. The stalks are put together in sheaves not much bigger around than a man's leg, and this shape they are taken home and threshed out at leisure.

At the beginning of the rice harvest the people have picnics and feasts. They erect temples in the fields to the goddess of the harvest. Each temple is about as big as a pigeon-house, and the offerings consist of an egg, a dish of fruit and bits of sugar cane and cooked rice. As the grain ripens sheeters are erected on poles in the fields and children or grown-ups are stationed in them to watch the crop or to scare off the birds. Sometimes strings are stretched from one part of the field to the other, and these scare-crows are manipulated so that the boy in the shelter can frighten the rice birds a half mile away.

The rice lands supply the food of the natives, and the Dutch Government watches them very carefully. It insists that all contracts made shall not interfere with their cultivation, and it provides that they shall be taken care of for the people. The government aids in their irrigation, and it is due to it largely that Java, with the thickest population perhaps on the face of the globe, does not have famines.

The natives are lazy and shiftless. Were they not protected, the Chinese or other capitalists would corner the rice, and it would be for sale at high prices. As it is, every one has all the food needed, and there is but little distress and no begging.

Some of the rice lands are owned by the villagers, and are rented out to the rich planters. In such cases only one-half can be rented; the remainder must be kept by the village for rice, and no rice land can be leased for longer than five years at one time. I met a Dutch indigo farmer not far from here, who told me that his estate was leased from the Sultan of Djokjakarta, but that he was forced to keep half of it in rice. His daily

laborers worked only a certain number of days of the week and only certain hours of the day, devoting the rest of the time to their rice lands.

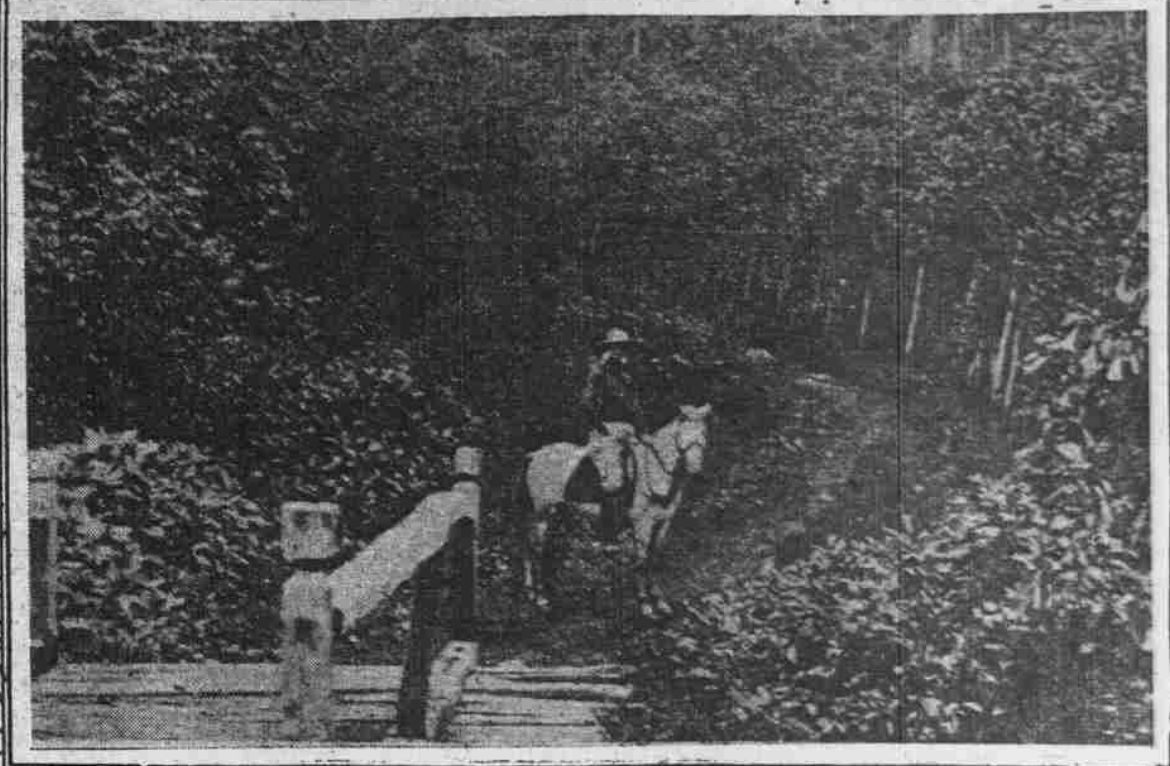
I asked this man something about the wages and hours of work of his men. He told me that the average day was 10 hours, and that they worked from 6 to 12 and from 1 until 5, and sometimes later. He pays them about 8 cents a day, I have met others who pay only 7 cents a day, but in several cases this was for only six hours' work, the men knocking off at noon.

In the cities wages are higher. In Soerabaya there are common laborers who get as much as 16 cents for 10 hours, and on the Netherlands-India Railway the trackmen are paid 14 cents a day and retired with pensions when they get too old to work. I understand that a native can keep a family here on \$1.50 a month and have plenty of luxuries. He can, in fact, earn from \$2 to \$4 more than he needs. This is, of course, from the Java standpoint, and not an American one.

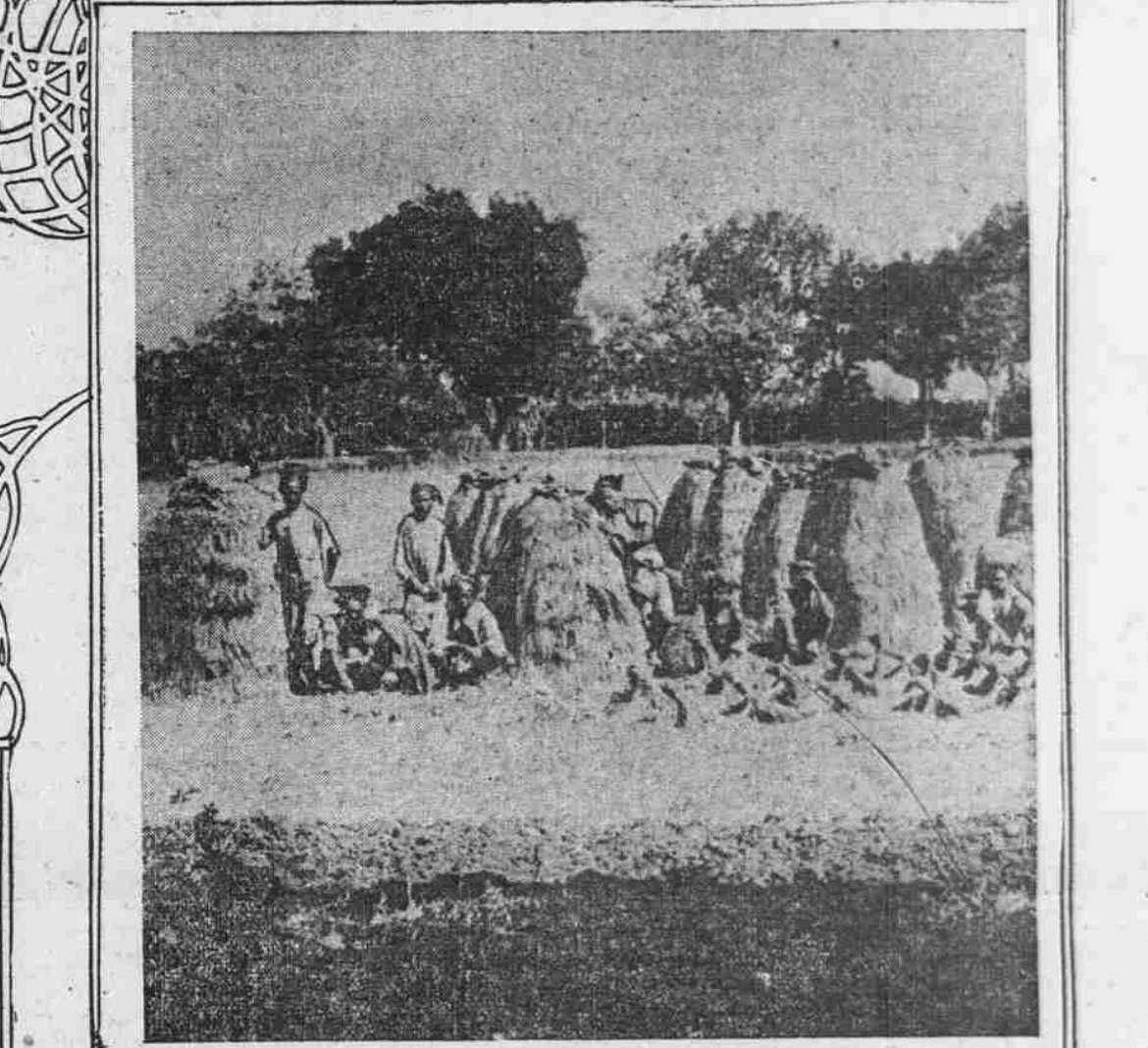
In some parts of the island the people need more, and notwithstanding that they are paid more, are poor. This is in the few provinces in which liquor and opium are permitted to be sold. The government has turned out the opium to the Chinese merchants and the natives have contracted the habit, as soon as a native begins to eat opium he becomes practically worthless. Most of the Java states prohibit the sale of the drug, and it would be a good thing if it could be wiped out entirely. The only reason for maintaining it is the large government revenue which comes from its sale, for the monopolies of salt and opium furnish about one-fourth of the government receipts.

I should like to see a forestry department established in the Philippines. We have a vast amount of hardwood timber there now, and there is no doubt but that teak-wood and mahogany could be planted at profit. It might take a generation or so to grow the trees, but Uncle Sam lives forever. Here in Java I have seen a number of government plantations of teak-wood. The Dutch have planted millions of trees. They are taking care of them, and in time they will be of great value. The trees are set out about four feet apart at the start, and when young, the forest looks more like a thicket than anything else.

FRANK G. CARPENTER.



ON A GOVERNMENT PLANTATION.



IN A JAVA RICE FIELD.

LANGLEY'S AERODROME DWARF'S SANTOS-DUMONT'S AIRSHIP.

WASHINGTON, Sept. 28.—Of the many interesting features which go to make up the annual report of the Smithsonian Institution, which has been published in an edition of 20,000 copies for general distribution through members of Congress, the most striking is a reproduction of the first picture ever made of a flight of the "aerodrome," or flying machine, invented by the secretary of the Smithsonian, Mr. S. P. Langley. The reproduction is a half-tone, in the form of a large, folding plate, and is copied from a photograph, hitherto unpublished, taken by Mr. Alexander Graham Bell, the inventor of the telephone.

Comparatively little has been said publicly during the last two or three years regarding Mr. Langley's epoch-making invention, for the reason that his investigations have been continued for the special benefit of the Board of Ordnance and Fortifications of the War Department, with a view to developing the usefulness of the machine in warfare. But it will be remembered that the aerodrome is strictly mechanical in its operation,

and thus in no way resembles, for example, the airship with which the young Brazilian aeronaut, Santos-Dumont, has recently been endeavoring to circumnavigate the globe from which it essentially derives. Below is the secluded Island of Chopawamsic, near Quantico, on the Virginia shore of the Potomac, some 30 miles below Washington.

The flight, which is thus vividly rendered took place May 6, 1896, and was a private trial, Mr. Bell being Mr. Langley's only companion outside of his regular assistants. The machine—one of several which have since flown considerable distances under Mr. Langley's supervision—was launched from a specially constructed houseboat, and was supplied with water sufficient only for a short course, lest, in its uncontrolled flight, it should get altogether out of reach and lose itself in the neighboring Virginia forests—an accident which would have been sufficiently serious at a time when the funds available for Mr. Langley's experiments were limited.

In connection with the illustration Mr. Bell's account of the flight has special interest, and is accordingly quoted in the present Smithsonian report. "The aerodrome," he writes, "at a given signal started from a platform about 20

feet above the water and rose at first directly in the face of the wind, moving at all times with remarkable steadiness, and subsequently swinging around in large curves of perhaps 100 yards in diameter, and continually ascending until its steam was exhausted, when, at a lapse of about a minute and a half and at a height which I judged to be between 80 and 100 feet in height, it fell, the wheels ceased turning, and the machine, deprived of the aid of its propellers, to my surprise, did not fall, but settled down so softly and gently that it touched the water without the least shock, and was in fact immediately ready for another trial.

"In the second trial, which followed directly, it repeated in nearly every respect the actions of the first, except that the direction of its course was different. It ascended again in the face of the wind, afterwards moving steadily and continually in large curves accompanied with a rising motion and a lateral advance. Its motion was, in fact, so steady that I think a glass of water on its surface would have remained unspilled. When the steam gave out again it repeated, for the second time, the experience of the first trial when the steam had ceased, and sailed quite as gently and easily down.

What height it reached at this trial I cannot say, as I was not so favorably placed as in the first, but I had occasion to notice that this time its course took it over a wooded promontory, and I was relieved of some apprehension in seeing that it was already so high as to pass the trees top to top or 20 or 30 feet. It reached the water one minute and 31 seconds from the time it started, at a measured distance of over 800 feet from the point at which it rose.

"This, however, was by no means the length of its flight. I estimated from the diameter of the curve described, from the number of turns of the propellers, as given by automatic counter, after due allowance for slip, and from other measurements, that the actual length of flight on each occasion was slightly over 2000 feet. It is at least safe to say that each excoed half an English mile. It seems to me that no one who was present on this interesting occasion would have failed to recognize that the practicability of mechanical flight had been demonstrated."

A very interesting general description of the aerodrome is also included in the report. The appearance of the models which Mr. Langley has used for his demonstrations might not inaptly be com-

pared to that of a giant dragon fly. To a long rod are attached, like a body, a twin engine and boiler, four wide spreading wings, a tail-like rudder, and twin propellers placed nearly amidships, between the two sets of wings. The whole weighs about 30 pounds, one-fourth of which is the engine and its appurtenances, which are thus of unexampled lightness. The engine itself, with cylinders, platens and all moving parts, weighs only 25 ounces. Light as it is, however, it will turn the propellers easily at a rate of 800 revolutions a minute, and thence up to 1200 revolutions, thus driving the aerodrome at a speed of from 20 to 30 miles an hour.

The maximum speed possible has not been calculated, nor, indeed, has the very highest speed actually attained been measured; but, according to "Langley's law," so called, the power required to drive the machine would in theory diminish indefinitely as the speed is increased, and in practice would diminish in a very considerable degree. It must be remembered, however, that security has been chiefly sought hitherto, and the conditions which give this increase of speed with decrease of power must be limited by others which demand that the flight

should be made without any accident. It is necessary to launch the machine against the wind. Once under way it flies steadily forward and upward until the machinery ceases to revolve, and then it floats slowly downward, alighting on the water as gently as a gull. The speed is regulated by the inclination of the wings, or, more accurately, the motionless supporting surfaces.

The machine is built almost entirely of steel, and is far heavier in relation to air than a ship of solid lead would be in relation to water. For it must be remembered that the support which it receives from the air is due to another principle than that involved in the buoyancy of a ship; that is, to the rapidity with which it runs over the air, like a skater over thin ice, whence the special significance of its Greek-derived name.

What the future of flying machines may be one may not predict. The present Smithsonian report, however, contains an article—now published for the first time in this country—prepared as an address, by M. Janssen, the president of the International Aeronautic Congress, in which the importance of the air as a medium of navigation is very strikingly brought out.