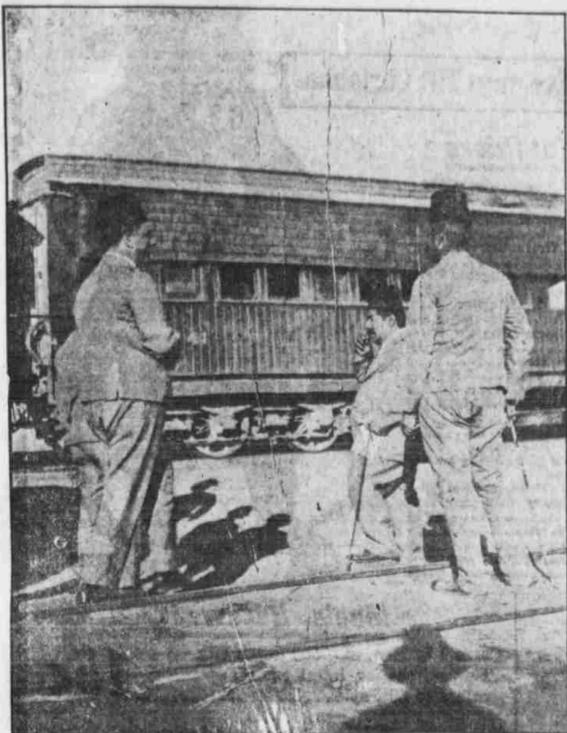


Possibilities of the Mines and Cotton Plantations of Western Africa



FRENCH OFFICIALS, SENEGAL RAILWAY.



PASSENGER OF THE SAHARA.



AFRICAN NEWSBOYS.



NATIVE RAILWAY PASSENGERS.

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WASHINGTON, Dec. 18.—Special Correspondence of The Bee.—Uncle Sam should keep his eye skinned as to the developments going on in West Africa. That part of the world is practically unknown to us and still its trade is growing like a green bay tree. All along the coast from Senegambia to German Southwest Africa railroads are building, experimental plantations are being set out and here and there mines of various kinds have been discovered. Away down near the Cape in the German possessions, there is a place called Oravi, where valuable deposits of copper are now being mined. The ore in sight is said to be 300,000 tons, and it is claimed that it can be produced so as to net \$15,000,000 clear profit. Portuguese West Africa has copper, iron, petroleum and salt and its oils and asphalt fields are now being worked by a British syndicate. I have already written of the great Katanga concession, which King Leopold of Belgium is working in connection with the English on the watershed between the Zambezi and the Congo. This is to be reached by a railroad 1,200 miles long through Portuguese West Africa to the Congo Free State. It will open up larger copper deposits than any ever discovered and will flood the world with that metal and tin. The tin mines run through a range of hills 150 miles long and the copper mountains are something like 300 miles in length. An extension of the Cape to Cairo road has just been projected to this great mining region and within a short time it will probably be a beehive of industry.

There are valuable minerals in the northern part of the Congo Free State, and the French Congo contains gold, copper and iron. Gold has been recently found in the Kamerun, belonging to the Germans which lies just to the north; and a little beyond that is the famous Gold coast, on the Gulf of Guinea, from which the English get the name of their \$5 gold pieces. The mines there have been worked for generations, and they are still turning out considerable quantities. The output now is something like \$4,000,000 a year, which is forty times the product of 1901. In 1906 27,000 ounces of gold were taken out, and there has been a steady increase in the product for more than five years. At present both quartz and placer mines are being worked, and large crushing mills have been installed.

West Africa's New Railroads.

As to the railroad development, it embraces the whole coast of the continent. The Germans have several large projects under way in Southwest Africa. They have already built a line 237 miles long from Swakopmund, their port, near Walvis bay, to Great Windhoek, the capital; and they have made arrangements for a railroad 600 miles long to go from Swakopmund to Oravi and the copper mines. This road will probably some day be connected with the Cape to Cairo line, running northward from Capetown to the Zambezi; and, in that case, it will shorten the distance between England and Bulawayo by 1,800 miles.

The Lobito Bay railroad has already been completed for a hundred miles or so inland from the Atlantic; and there are now several thousand laborers working upon it. This road will be over 1,000 miles long, and it will be made after the usual South African fashion. Its gauge is three feet six inches, and the rails weigh sixty pounds to the yard. The ties are to be of steel, on account of the white ants, which eat every thing wooden; they will weigh seventy pounds each. All the bridges are standardized, and the rolling stock is the same as that used in Rhodesia. Some of the engines are being built in England, but the heaviest ones are to be supplied by the Swiss and the Germans.

By the time this road reaches the copper mines the Cape to Cairo extension will be there, and the route to South Africa will probably change, as far as fast travel is concerned. Passengers will be taken to Lobito bay, and will thence go by rail to the Transvaal, and especially to all parts of Rhodesia. There will probably be an extension to Lake Tanganyika, and we shall have a line across the southern part of the continent. There is no doubt of the completion of the Lobito bay road. The company which is interested in it is the one which owns the copper mines; and there are tens of millions of dollars— I might say billions of dollars—of minerals awaiting its traffic possibilities.

Railroads of the Continent.

The Lobito Bay railroad will be largely controlled by the Congo Free State. The king of Belgium and his associates own a majority of the stock in the great copper concession, and they will see that it is operated in the interests of Belgium's colony. It will probably be connected with other roads which will open to trade the navigable tributaries of the upper Congo, and will form a part of the extensive railway system which has been projected for that country.

Few people realize what is going on as to railroad building in the Congo Free State. The Congo river is as long as the distance from New York to San Francisco, and two of its tributaries are each almost as long as from the mouth of the Hudson to the Great Salt lake. The navigable waterways of the system if stretched out in one line would reach from New York to Singapore, or half way around the globe, and they are so many that there is not a spot in the whole Congo basin which is eighty miles distance from navigable waterways.

The biggest European steamers now go up the Congo 100 miles from its mouth to Matadi. At that point there is a railroad 150 miles long, which climbs past the rapids to Stanley pool. This road has been in operation for a number of years. Within a short time a second gap in the river has been remedied by building a line just above Stanley pool ninety miles long; and a third line is projected of 200 miles far above that. This line is near the Hell's Gate cataract and between Sendwe and Bull. Another railway is projected which will cross the lower Congo to the copper mines, and others are to connect the Congo with the Mediterranean through the French lines proposed for the Sahara desert and with the Sudan system by a railway from the Uelle river to the Nile.

Motor Cars for the Mid-Africa.

Speaking of the Uelle region, this is in the northern part of the country approaching the Nile watershed, and until recently all transportation there has been by porters. Within the last year or so the government has been making roads and putting on motor cars and traction engines. There is to be one road from the Congo to the Nile, which will be 600 miles long, and motor cars built especially for it are now being constructed at Liege. In addition to them very serviceable traction engines carrying cars each holding several tons of goods have been made, and these will be used for heavy freight. The Belgians are also training the African elephants as a beast of burden. They first tried the Asiatic elephants, thinking the African beasts intractable. The Asiatic elephants died, and about three years ago the work of training the African elephant was begun. Twenty-eight elephants have already been domesticated, and they are now carrying bricks and timber for railway construction.

Guinea Coast Roads.

Golfe's northward along the Gulf of Guinea, a number of other important railroads have been projected, and some are already under construction. In the Kamerun the Victoria Lassoko road has been extended as far as Soppo, a distance of twenty-two miles, and another railway is building. In Togoland, also belonging to the Germans, there is one railway twenty-six miles long, extending from Lome to Little Lome. In French Guinea, a railway which is to run from

Canakry on the Niger has been opened as far as Kindia. This is about eighty-three miles inland. The road will meet the Niger at Kouroussa, and will have a big traffic. The French have also built two important railways in Dahomey, one of which is 149 miles long. Another goes along the Lagos frontier. They are extending both lines. They also propose to construct a track inland from the Ivory coast, and they have important railways in operation in Senegal.

To Open to the Niger.

The English have some railroads in their colonies upon the Gulf of Guinea. There is one 124 miles long, which goes from Lagos to Ibadan. This has just been extended to Oshogbo, which is sixty-two miles farther, and it will be built on from there into northern Nigeria to connect with the West Africa. Its inhabitants are more like the Egyptians or Algerians than the gulf negroes. They are Mohammedans, and are noted for their thrift and intelligence. In the past these people have been supplied almost entirely by the caravan which crosses the Sahara. Their chief town is Kano, the terminus of the trade

routes from Tripoli and the Upper Niger, which in olden times had caravan connection with the ocean, with the Mediterranean and with the Red sea.

This road, which is now building, will make it possible to take goods to Kano by steam. It is to begin at the town of Baro, the highest navigable point on the Niger, and to extend from there 400 miles eastward to Kano.

When this road is built all the supplies for northern Nigeria will be sent to the Gulf of Guinea up the Niger and inland by rail, and the caravan trade will be destroyed as far as crossing the Sahara is concerned. This will be a great blow to the countries along the Mediterranean.

A loan for this Nigerian railway has already been authorized by the British government, and I understand that the line is to be pushed with all possible speed. The track is to be of a forty-inch gauge, and is to be completed within four years. The cost is estimated at about \$7,000,000 or \$8,000,000, and it will be met by bonds raised on southern Nigeria, the interest of which will be guaranteed by the government. As to dividends, the road will hardly pay much for some time to come. It will greatly develop the country, however, and it is advocated by the authorities as a military necessity.

Big Trans-African Line.

These rich lands of Nigeria form an important link in another big scheme which is to join the Mediterranean countries with both seas in Western Africa. This is to combine a railroad across the Sahara, to be built by the French, with one to be made by the Germans, going through the Kameruns to the Gulf of Guinea and branch lines extending east and west from these two. The French part of the road is to be built southeastward from Timbuctoo, or what is more probable, go to the southeast and strike Kano. I went over the first 400 miles or so of this road. It now extends from Oran along the border between Morocco and Algeria to Colomb Bechar, in the heart of the desert. I also saw the railway which leads from eastern Algeria down to Biskra, in the Sahara. It is more probable that the latter road will be extended than the former, and I understand the survey from Biskra to Lake Chad has been made. The road will go to the oasis of Wargia and thence up the Ichangar valley. It will cross the Amador range of mountains in an altitude about 7,000 feet to Kuka, on Lake Chad. The cost of construction is estimated at about \$16,000 per kilometer. From Kuka the Germans are expected to take the road down through the Kamerun to the Atlantic, and there will probably be an extension westward to Kano to connect with the Nigerian line above spoken of, and also other branches

which might connect with the roads of the Congo.

Timbuctoo has always seemed one of the most inaccessible parts of the world. It will surprise many to know that it can now be reached by steam. The French have built a railway from Kayes to the Niger, a distance of 53 miles, and they have also a road connecting St. Louis and Dakar. One can go by steamer from St. Louis to Kayes, and on the vessels of the Niger from there to within a few miles of Timbuctoo. The time is comparatively short and the expense inconsiderable.

Timbuctoo itself has dwindled. It used to be one of the chief trading stations on the southern side of the Sahara, and caravans of thousands of camels from Morocco and Algeria came there every year. Today the most of the goods go by this steam route, and the camel trade amounts to but little. Timbuctoo is now not even a mission center, and the old song has lost its meaning. "You may remember it: "I would I were a cassowary In the wilds of Timbuctoo, Wouldn't I eat a missionary Skin and bones and byrn boom too!"

Educating the Natives.

On the other hand mission work is increasing in West Africa. The churches were never so strong nor the converts more numerous. The various governments have assumed their part of the white man's burden and are introducing schools at the principal centers.

It is five years since the French adopted a uniform system of education for their West African colonies, and they now have 10,000 native children who are receiving elementary instruction, and of these, 8,000 are girls. Their expenditure on negro education here last year was \$250,000. They have schools at all the towns of Senegal; at Dakar there is a technical school, and at St. Louis a normal school. There are 15,000 children in the mission schools of the latter country, and 8,000 in the mission schools of German Southwest Africa.

As to the Congo Free State, it has now 109 mission stations, with a little under 500 missionaries, of whom 24 are Catholics and the remainder Protestants. The missionaries co-operate with the government, as far as education is concerned, and the latter has formed three agricultural colonies, where negro children are taught.

In the Portuguese possessions, notwithstanding the outrages which have been perpetrated on the natives in the way of slavery and forced labor, there are fifty-two government schools and also municipal and private schools with about 2,600 pupils.

Some Big Possibilities.

All of these West African colonies have big possibilities, and the European nations to whom they belong are investigating them. In nearly every one cotton is being planted, and in some the experiments are successful. Nigeria, for instance, expects to be shipping 100,000 bales to Europe by 1910, and so far, the growth of the cotton crop has been as rapid there as it was at the start in the United States. I understand that it took our cotton belt ten years after the first crop was planted to reach a product of 100,000 bales, and that 1,000,000 bales was only attained at the end of thirty-five years. Cotton was first planted in Nigeria in 1901 and the crop has doubled each year since then. It is only recently that any attempt has been made to raise it in northern Nigeria, but experimental stations have now been started there and steam ginneries are to be introduced. This movement is backed by the British Cotton Growing association, which has a capital of \$1,250,000, and which is pushing cotton planting on both sides of the black continent. The Germans have established cotton plantations in their eastern and western African possessions. I understand that the going well in Togoland and the Kamerun, and I know that they are raising some cotton on the highlands above Victoria, for I saw the bales loaded on the ships when I navigated that lake.

Rubber and Mahogany.

An equally great interest is exhibited in the timber products of the several colonies. The rubber industry is being pushed everywhere and nearly every nation is setting out rubber plantations. The French have planted 15,000,000 rubber vines in lower Guinea and Dahomey, and they plan to set out 500,000 more trees every year. The Germans are planting rubber and so are the English.

I have been much interested in the mahogany resources. A great deal of that wood is now being exported from Nigeria. Something like 600 logs were shipped from Lagos last year and altogether about 7,000 logs, containing over 4,000,000 feet, were then sent away by the English. Considerable is shipped from the Ivory coast and from other localities.

FRANK G. CARPENTIER.

In the Field of Electricity

Current Power on Railroads.

THE decision of the New York Central managers to extend the use of electric power on its approaching New York City goes to show the satisfactory results of the change effected within the city limits. The change of power was under the supervision of William J. Wilgus, vice president of the company. In discussing the results in the New York Times, Mr. Wilgus says, in part:

"The early electrification of steam railroads in great centers of population is inevitable, because the demand of the public for the removal of the disagreeable features incident to the use of the steam locomotive is increasing. The economies that will at least tend to offset the interest charges on the cost of the change. Away from the large cities the prospects for the electric steam locomotive are very remote, pending the perfection by the inventor of devices that will substantially reduce the cost of installation and thereby minimize the burden of additional fixed charges.

"For instance, with the direct-current third-rail system the cost of distribution is almost twice that of the alternating current of expensive substations for the conversion of high-pressure alternating current, so well suited for economical transmission, to the low voltage direct current for working purposes in the third rail and motors. Attempts to escape this expense by the use of the overhead catenary current system have not been entirely successful where adopted on trunk lines, as the saving in substations has been offset by the greater weight and cost of electric locomotives and by unreliability of operation.

"This question of comparative cost and reliability is the real point at issue in the warfare that has been hotly waged for the last five years over the relative merits of these two systems. Until this dispute is definitely settled no great progress can be expected in the general application of electricity on steam railroads.

"Apart from the substantial reduction in the cost of installation of electricity on steam railroads that will follow a satisfactory solution of the problems of the rival system there are a number of other opportunities for advance in the art. For instance, the development of water powers and the utilization of cheap fuel at the mines, combined with an extended permissible radius of transmission, will all tend to lower the costs of current to prospective users at remote points. Then, too, improvements are constantly being made in power station design by minimizing the losses accompanying the conversion of fuel into energy. The simplifying of signal systems so as to reduce the cost of electrified steam railways is also an important item. The necessary safeguards for protecting the movement of heavy trains at short intervals on electrified trunk lines are now very expensive and one of the principal handicaps to the widening of electric railways.

"The high first cost and the expense of maintenance of batteries now preclude their more extensive use for insuring reliability of train service and lessened cost of operation. Their improvement will not only overcome that obstacle, but will also make more practicable the use of electric

locomotives that will be nondependent on third rails and overhead conductors, particularly in yards and terminals.

"It is hoped that in the early future the question of the preferential electric system for adoption on steam railroads will be conclusively settled, and the improvements in the generation, transmission and conversion of current and in signals and rolling stock, with due regard for safety and reliability, will largely reduce the cost and increase the efficiency of electrical appliances. When that time comes the steam locomotive may well look to its laurels."

Breakfast by Electricity.

Thanks to the science of electricity, the trouble and delay of getting breakfast has been reduced to a minimum. No longer does the man of the house tread feverishly about the dining room while the good wife patiently shakes the kitchen range and endeavors to hurry the sluggish fire so her "lord and master" can have his breakfast before going to work. And then, just as the reluctant teakettle begins to boil, his last car comes around the corner and he slams the front door and hurries breakfastless to work.

Breakfast these days, in the modern home, is merely a matter of pushing the button. Snap a switch and the invisible current boils the water in the teakettle. Another switch turned and the coffee percolator begins to sputter and in a few minutes the cereal is cooking. Four zig-zag eggs are being boiled, poached, steamed or fried. The toast can be made as needed on the breakfast table and, for that matter, all of the electrical devices can be used right on the table without needless heat or any dirt or danger.

The very latest of the breakfast utensils is the electric toaster. This device is inexpensive and most efficient. The bread to be toasted is placed in a vertical position on either side of the heating element. By this method the bread is not burned as it is in horizontal toasters. It only takes about three minutes to prepare two nice browned slices from the time the current is turned on. The base of the new radiant toaster is made of porcelain, through which projects the terminals of the heating element. To this base is attached a neat wire frame or cage for holding the slices to be toasted on either side of the heating unit. The heating element consists of four zig-zag coils of special resistance wire suspended vertically. The four heating coils being connected in duplicate, all danger of short-circuiting the device with a fork is eliminated.

Growth of Electric Railways.

The electric railways of the United States carried last year 6,800,000,000 fare passengers. This wonderful increase is due to the growth of the street railway and interurban railway service, better transportation facilities and the increase of suburban residents.

The number of persons to be transported increased at the rate of 1,500,000 annually. The number of passenger cars operated has increased at the rate of 30 per cent for the last five years. With the population of the United States estimated at about 90,000,000, the figures given above would seem to show that every man, woman and child in this country has ridden seventy-eight times on the electric railways within the last year.

This gives some idea of the extent of the electric traction in this country. The electrification of steam railroads has already been successfully accomplished, and it is predicted that within a comparatively few years all the principle railroads of this great country will be electrified.

Town Finds Work for Beaver

Wild animals often destroy the works of man, but it is very seldom that they repair the damages caused by time and the elements, but such an instance, quite remarkable in its importance, has been brought to light this week.

At Phillips upper village in Maine is a wooden mill, driven by water power, coming over a large dam in the Sandy river. Recently this dam has leaked freely, and though repairs have been attempted the task was found so complicated and difficult that the dam has never been put in proper shape by man since the leakage was first discovered.

Suddenly, however, the leakage stopped, and an investigation showed that a colony of beavers had taken up their abode in the mill pond, apparently coming from further north on the Sandy river, where these creatures have been known in past years to be quite numerous.

All summer there has been a colony of beavers industriously at work in a pond on woodland owned by Joel Carlton of this town, and Mr. Carlton thinks this may be the same colony that has now come down to the village to live, quite as though metropolitan life were the proper thing.

Immediately here, Pease dislodged one of these trees and then he saw where the animals had dragged the trunks of a number of trees into the mill pond.

Upon advancing toward the shore of the pond he heard a noisy splashing in the water which sounded like stones thrown into the water. Going near he plainly saw two beavers at play. They paid no attention to his visitor, though they must have seen him, for he made no attempt to hide his movements.

The attention of the operatives in the mill was called to the play of the two animals, and the young women watched them from the upper windows for some time.

It is believed that when the beavers came to the mill pond they decided to appropriate it to their own use, and discovering the imperfect condition of the dam, set out at once to repair it for beavers are known to be very painstaking in their work and equally methodical in their habits.

It is known that they have not only sunk many poplar trunks in the mud just above the dam, but have also placed two large birch tree trunks there.

The cutting down of trees by the beavers was done a considerable distance from the pond, the poplars being selected from quite a dense growth on the sunny side of a hill, and evidently having been dragged to the pond by easy stages.

Beavers have been protected in Maine since 1905, and are undoubtedly becoming more tame each year, but that they should carry their work almost into the heart of a busy and growing village is considered remarkable.—Boston Herald.

Two important steps have been taken by England recently to the detriment of German industry. The British radical government has put in operation its act whereby foreigners who wish to protect a manufacturing patent in England must work the patent itself in England. This law strikes

hardest at Germany's enormous chemical industry.

It has always prided itself on the intelligence by which the application of scientific treatment to mineral and vegetable by-products has given it almost the world monopoly of a class of business that often yields hundreds per cent of profit. It controls the market in aniline dyes. Henceforth instead of exporting their products to England after their manufacture has given employment to a large laboring population and staffs of experimental chemists and managers the companies owning these patents must transfer, so far as their British trade is concerned, all the working benefits to that country.

It is the first warning shot in the commercial war. Hitherto England has let its traders rely on themselves to maintain their hold on the open international market. Now that their government has furnished them with a protective law as a weapon in their struggle Germany realizes that it is coming nearer to a war between the two governments and people for commercial supremacy.

It lavishes its resources on naval construction in the hope that the British imperialist's maxim that "trade follows the flag" may prove its own industrial salvation. Practically the great commercial rivalry between Hamburg and Bremen would prove to its advantage. It has practically no small harbors to defend. All its enormous modern tonnage could be gathered in these two ports for protection against the enemy, and that same tonnage could at a word be concentrated by the government for an aggressive raid on the enemy.

Another reverse visited upon German industry in its days of difficulty is the raising by the reform government at Constantinople of the import duty in Turkey on manufactured goods from 11 per cent to 16 per cent. It is a step that Germany believes England has approved Turkey's taking in order to furnish fuel for the establishment of the new system, and it is taken chiefly at the expense of German trade.

With the Kaiser himself as his economic pioneer the Germans have been led to look on the Turkish market as their own special inheritance. In the days when the Turkish market would prove to its advantage it has practically no small harbors to defend. All its enormous modern tonnage could be gathered in these two ports for protection against the enemy, and that same tonnage could at a word be concentrated by the government for an aggressive raid on the enemy.

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