Wireless Telegraphy in the United States Army Signal Corps

TAPPING A TREE FOR WIRELESS TELEGRAPHY.

IN 1899 General Greely, the chief signal officer of the army, following his well known custom of investigating and developing all new appliances pertaining to military signalling, made it possible for the signal corps of the army to devise and maintain the first system of wireless telegraphy publicly operated in America. Since that date the signal corps has kept pace with the improvements in wireless systems with a view of being prepared at any moment to provide the army with the best and most modern wireless appliances for the field, where the final test of all military machines must be made. In connection with the experimental work done in wireless telegraphy by the signal corps mention must be made of an incident which occurred last year during the army maneuvers in California, where a signal party following advancing troops with a buzzer line came upon ground so dry that it was found impracticable to secure a return earth circuit, or a "ground," as it is familiarly called. In the emergency an officer seeing a living tree nearby drove a nail in the trunk of the same, attached his ground wire to the nail and found, to his surprise, that the minute streams of sap which extend upward from the roots of the tree furnished an excellent ground connection for the buzzer line.

Value of Chance Discovery.

Major General Arthur MacArthur, U. S. A., says in his official report of the maneuvers of 1904 under his command: "The most notable event connected with the field exercises herein referred to resulted from the exceedingly resourceful manner in which First Lieutenant W. M. Goodale, Signal corps, discharged his duties at American lake. Under the pressure of emergencies which arose in pursuance of his field work, he attempted to obtain a 'ground' for the return circuit of an electrical wire by means of nails driven into trees. The experiments were surprisingly successful, and inasmuch as the empirical discovery thus made has already become the subject of systematic investigations, which may contribute materially and substantially to the scientific knowledge of the world, it is desired to make a permanent record of the initial steps in the premises."

This incident referred to was made the subject of much investigation and many experiments by Major George O. Squier of the signal corps, who has, as a result, announced an original conclusion to the effect that living vegetable organisms may be used as a part of a circuit for the electrical oscillations used in wireless transmission, a discovery which has made possible the use of ordinary living trees for receiving antennae at wireless stations. For the limited areas covered by armies in the field all military men will at once appreciate the importance of this discovery to future field signalling.

It was the good fortune of the writer to be permitted to do experimental work quite recently on the Pacific coast in the use of vegtable antennae for wireless field signalling. The scene of the experiments was the vicinity of the post of Benicia barracks, California, about twenty-five miles north of San Francisco, in which region other wireless stations of the United States navy were already in operation at Yerba Buena island, near San Francisco; at Mare Island navy yard, in the Farralone islands, and on several war vessels in San Francisco harbor.

Trees Vastly Serviceable.

In order to read any wireless message passing between any of the stations named it was found only necessary to send a lineman up the tallest living tree available, drive a nail in the same and connect the nail by suitable insulated cord to the receiving apparatus below, which, of course, was suitably grounded—the messages thus intercepted being heard by the use of an ordinary head telephone, plainly and distinctly, regardless of the noise of the wind and of enlisted men moving about and talking in the vicinity of the station.

Messages were received when the receiving antennae consisted only of a barrel hoop crossed with several bare copper wires connected in parallel with the receiving apparatus below, the hoop being simply thrown from the ground to the upper branches of a tree at a height of about thirty feet and with an electrolytic cell detector messages were read from a station eight miles distant when the antennae consisted of only about thirty feet of bare iron wire stretched horizontally between two barracks at a height of about ten feet. When using a fifty-foot aerial, consisting of a seven-strand insulated cord suspended from the post flagstaff, no difficulty was experienced in reading massages sent from the naval station in the Farralone islands. These signals could be faintly read when the detector was simply connected to a nail driven in a tree branch at the height of about thirty feet.

In the majority of the work the receiving instruments consisted of a DeForrest electrolytic cell detector, a synchronizer and some insulated cord wire, all of which can easily be carried in two soldiers' haversacks.

Best Trees for the Purpose.

Many experiments with the use of the electrolytic cell detector impressed the writer that the most suitable trees for antennae were the tallest trees with the most foliage and that the intensity of the sound in the receiver varied directly with the number of contacts made in the trunk of the tree. The best ground connection was obtained when an iron peg was driven into the earth at least fifty feet from the base of the tree used in the direction of the sending station and connected with the detector by an insulated wire. Raising the insulated wire off the earth between the peg and the detector invariably improved conditions. Many experiments were made in moving the peg radially to and from the tree station, with the result that generally the approach toward the tree diminished the sound in the receiver. The many varying results obtained create the impression that the results are due to the underground conformation of the tree root system, which is naturally the continuation of the antennae. After many attempts no diminution in the intensity of the sound in the receiver could be detected, due to the screening effect of trees or groves of trees surrounding a particular tree in use as an antennae. A message was received using a tree antennae when a high brick wall stood immediately in front of the tree and between it and the sending station.

LISTENING TO AN INTERCEPED MESSAGE.

Another Valuable Pointer.

After many experiments the writer became convinced that the greatest activity took place within the electrolytic cell detector when the earth peg was planted in a right line between the sending and the receiving stations and that any shifting of said peg in azimuth from the position named diminished the sound in the telephone receiver until the minimum was obtained when the earth peg has been shifted 180 degrees and was in the rear of the receiving station in the prolongation of the right line joining the sending and receiving points. The value of thus being able to detect the direction from which oscillations are coming and thus being able to detect the direction of the enemy's station will be of great value in the field.

The theory of the wireless system is not difficult or mystifying and the appliances used are not complicated for the distances involved in the case of an army operating in the field and maintaining communication between its various units and base.

Viewing the immense advances made in wireless telegraphy in the last year, the possibilities of the future of field signalling are almost too stupendous to contemplate. The signal corps field signallist of the future, with the possibilities of the wireless telegraph and the future storage battery, may carry in his haversack all the apparatus necessary to converse readily with any distant station.

CHARLES McK. SALTZMAN,
Captain Signal Corps, U. S. A.

Cuba's New Port and the Vast Fruit Industry it Has Developed

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ANTILLA, Cuba, Aug. 17.—(Special Correspondence of The Bee.)—I date this letter at the future great city of eastern Cuba, the new port of Antilla, the terminus of Sir William Van Horne's Cuba railroad, on Nipe bay. The place now consists of some thatched huts, a railroad depot and a large warehouse which serves as quarters for the civil engineers and other Americans who are laying out the town. The railroad has been opened only a short time and the wharves, although such that great steamers can land at them, are far from completion.

The plans are upon a grand scale, and when carried out, Antilla will be one of the beautiful cities of the world. As it is now, it is surrounded by wilderness. There are thousands of acres of forests in every direction, with here and there a great fruit or sugar plantation, cut out of the woods.

Nevertheless, this country will one day be the winter vegetable garden for New York, and it has already begun to supply our markets with oranges, bananas, pineapples and other tropical fruits. It is only two and a half days by fast steamers from New York City, and next winter a line of large vessels will be going back and forth, carrying freight and passengers. The port is already connected with Havana by railway, and the Cuba road will make such freight rates that a large part of the products of eastern and central Cuba will be shipped to the United States via Antilla. The loading arrangements will be such that freight can be cheaply transferred from the cars to the vessels, and lower freight rates will be given than are possible via Havana. Indeed, it is expected that a large part of the travel from the United States to Cuba will be carried this way, and that this whole region will be rapidly developed.

Some Big Enterprises.

At present the most of the lands here are in the hands of large capitalists and the native Cuban. It is impossible to buy small tracts, and everything so far is on a grand scale. I came to Antilla from Santiago, leaving the main line of the Cuba road at Alto Cedro, which is tweny-five or thirty miles from Antilla. Almost the whole country from there to the immediate vicinty of the bay is owned by three or four families. That nearest the bay belongs to H. Demois & Co., who own about 40,000 acres and have already 4,000 acres under cultivation, and to the Nipe Bay company, an association of Boston capitalists, which has bought 125,000 acres, much of which it proposes to clear and plant in cane. Within a short distance of these tracts is one of 40,000 acres, for which the Knickerbocker Trust company of New York is negotiating. The owners are rich Cubans, and they ask $500,000 for the property. Near it is another estate of 50,000 acres, which includes the site of Alto Cedro. This is valued at $10 an acre or at $500,000, and can only be bought in the lump.

United Fruit Company Estate.

Within a short distance of Nipe bay is Banes bay, the lands about which are owned by the United Fruit company whose steamers run regularly between Nipe bay and Banes bay and New York. This company has 72,000 acres of land, and about 19,000 acres under cultivation. It has almost 8,000 acres in sugar cane, and its sugar mill alone cost $800,000. It is now grinding out about 40,000,000 pounds of sugar a year. Its annual banana shipments to New York are about 1,500,000 bunches. The Dumois company has an enormous acreage under fruit, and it has also several thousand acres in cane.

The Nipe Bay company is composed of Yankees, who are largely interested in the United Fruit company. It has a capital of about $6,000,000, and if its plans are carried out it will have the largest plantations in Cuba. It is now preparing to build the largest sugar mill in the world, one which will grind 3,000 bags per day, and which will eat up as much sugar cane as can be produced on 16,000 acres.

All this land, as I have said, is now in large tracts, and its owners consider its present value to be something like $10 per acre. It may be years before it is offered to the public, but the probability is that much of it will eventually be subdivided and that this whole region will be covered with fruit farms of greater or less size and of enormous value.

But let me tell you something about Nipe bay. It has the finest harbor in Cuba, and is so large that you could put Santiago bay, Havana bay and nearly every other good bay of this island inside it and have room to spare. It is ten or twelve miles long, eight or ten miles wide, and is entered by a narrow channel with a deep waterway. The channel is deep throughout to Corojal bay, where Sir William Van Horne has laid out Antilla. The bay is surrounded by hills and low mountains and its scenery compares with that of the Bay of Naples or the waters about the Isles of Greece. It has a fine climate and many think it will be one of the winter resorts of the United States. Sir William Van Horne has bought 150 acres on the Raymon peninsula, not far from the entrance. He is clearing this and expects to build a winter home there. I understand that a Chicago millionaire, whose daughter is to marry Sir William Van Horne's son, will build a residence nearby, and that other rich Americans are negotiating for similar properties. Just across the way the Dumois family has already constructed buildings on the island of Saetia, and the Nipe Bay company millionaires are likely to have homes on their property. The Spanish-American Iron company has bought 25,000 acres on the pine hills in the mountains on the other side of the bay, and are prospecting it for metals, and there are others who are negotiating with the Cubans for the lands remaining.

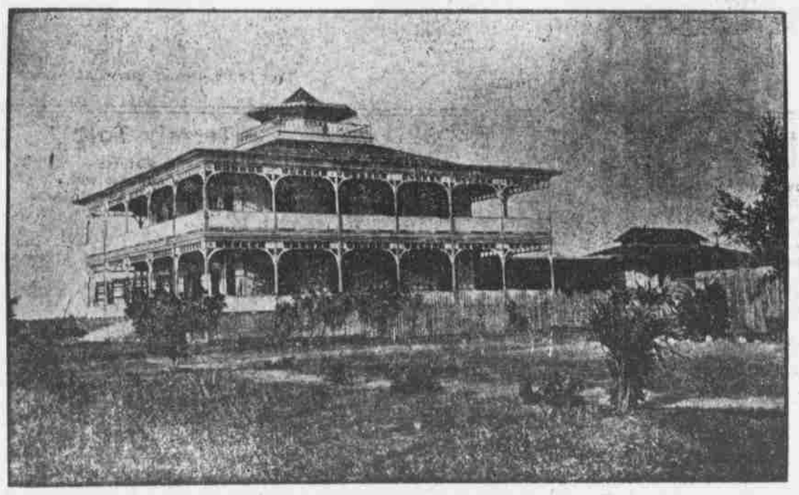
From Alto Cedro to Nipe Bay.

The railroad ride from Alto Cedro to Antilla gives a fair idea of the whole of this region, except where the plantations have been cut out of the woods and transformed by a miracle, as it were, from a tropical jungle to the richest fruit fields on earth. All the way along the road there is a thick forest composed of white-trunked trees, knotty and gnarly, which rise 100 or more feet in the air, and under them a thicket of young trees, which grow up for thirty feet without a branch. These trees are bound together with vines, long lianas hang down from their limbs, and here and there take root in the ground. The tops of the trees are covered with air plants, and orchids by the thousands roost in their branches. There are dead trees which have fallen this way and that, broken by the wind, and dead vines, the whole so matted and woven together that it would be impossible to go through this jungle without an axe or a machete. This wilderness continues all the way from Alto Cedra to Nipe bay, and it still surrounds the greater part of the bay. There are, however, about 4,000 acres which have been cut down, burned over, and turned into a plantation of sugar cane, oranges, bananas, pineapples, coffee and cacao. This tract belongs to H. Dumois & Co., and it is the result of only four years' work. It is the most wonderful agricultural exhibit I have ever seen in any part of the world.

Agricultural Garden of Eden.

This land, as I have said, was a jungle four years ago. Today it is an agricultural Garden of Eden. It contains 1,000,000 banana trees, 1,000,000 pineapples, 300,000 orange trees, 80,000 cacao trees and 160,000 coffee trees, all thriftily growing. The cultivated lands cover 4,000 or 5,000 acres. There are not as many weeds upon this tract as in the best kept kitchen garden of the United States. I rode on horseback thirty-five miles over the plantation, taking two days to it, riding sixteen or more miles at a trip, and I did not see a dozen weeds nor a dozen blades of grass. The crops are kept as clean as a floor, and the growth of everything is beyond belief.

This plantation is just at its beginning. The property is only four years old. The company owns 40,000 acres, and of this only one-tenth has been planted. It is expected that the planting will continue, so Mr. Dumois tells me, until they have 6,000,000 pineapples, 2,000,000 banana trees and 500,000 orange trees. These, when in full bearing, should net about 300,000 cases of pines, 1,500,000 bunches of bananas and 500,000 boxes of oranges every year. The company has a capital stock of $1,000,000, and when its plantations have reached the above condition they should bring in about $1,000,000 a year. This condition will probably come within two or three years. The company is a close corporation, consisting of Mr. H. Dumois and his son, his brother and a few friends and relatives. There is, I believe, no stock for sale.



HOME OF GEORGE DUMOIS AT SAETIA.

A PLANTATION VILLAGE.

Fruit King of Nipe.

Before I describe my visit to this estate, let me tell you something of its chief owner. This is Mr. Hippolyte Dumois, the fruit king of Nipe bay. He has been raising fruit in Cuba all his life, and he knows more today about the country and how to get the most out of it than any other man in it. His father was a coffee planter near Santiago, and Mr. Dumois began life in the fruit business. His first plantations were at Baracoa, on the northern coast of Cuba not far from Cape Maisi, and a little later he bought 15,000 acres of land near Banes bay. He cleared 10,000 acres there and set it out in bananas and was doing an enormous business shipping his crops to the United States when the Spanish war broke out. He then had a fleet of fruit steamers, there were twenty miles of railroad on his plantation and everything was on a proportionate scale. His property was destroyed during the war, but at its close he rejuvenated it and merged with the United Fruit company. He had a large amout of stock of this company and acted as manager of the Banes plantation, building the central Boston sugar mill, which is still running.

When everything was in full operation he decided to retire from the business life and went to Havana. He soon became discontented, however, and then returned here and bought the enormous tracts of land which are now owned by himself and family and the Nipe Bay company. The property was first bought in connection with the Nipe Bay company; but he has taken his share, and now owns in connection with his relatives more than 40,000 acres of the richest land in Cuba. A part of this estate is on the island of Saetia and the peninsula of Raymon, and another part on the mainland bordering the bay and the Tacaje river. He has about twelve miles of railway on the estate and has dug a canal through the neck of the Saetia isthmus, connecting Nipe bay with Levisa bay, making Saetia an island.

Pineapples by Millions.

I came with Mr. Dumois from Santiago to Antilla, and I have spent several days with him on his estate during my stay. Leaving Antilla, we rode across the bay in the plantation launch to Saetia, where Mr. Dumois has 1,000,000 pineapples, 1,000,000 banana trees and several hundred thousand orange trees now growing. Five hundred men are there employed, and the homes of Mr. Dumois and his sons and of the various officials make quite a colony. Their houses line the shore near the wharves, with a beautiful park between them and the beach. There is an office, a store, a blacksmith shop, a machine shop and a number of comfortable homes, the largest of which is that of George C. Dumois, the son of Mr. H. Dumois.

Sixteen Miles of Bananas.

Directly back of the buildings the banana plantations begin. They extend along the shore for miles, rising up the hills so that the whole side of the island is banked with a great mass of green leaves. The plantation has excellent roads, and during my stay I took a horseback ride through these banana fields of fully sixteen miles. The banana trees were far above my head as I rode through them on a little white pony, and, indeed, I could hardly reach the fruit by standing upright on my saddle. The trees were not over six feet apart and riding through them is like going through a forest of green trunks supporting great ribbon-like leaves which meet overhead and shade the ground. Now and then we passed a tree in blossom. Each tree had but one; but this was from six to ten inches long and at its base was as big around as my arm. It looked like a great bud rather than a blossom, and it formed the end of a bunch of bananas which extended out from the root of the leaves at a distance of from ten to fifteen feet from the ground. As I looked I noticed that the stem of the bunch hung down and that the bananas grow upward instead of downward, as many suppose. I counted many bunches which had fifty bananas upon them and was told that a single bunch may have as many as 100.

How the Fruit is Harvested.

In cutting bananas trees are chopped almost in half. As they fall the bunch is caught and cut off, after which the tree is chopped off to the greund, to allow the sprouts at the foot to have the full strength of the roots. Bananas here will sprout up six, seven, eight or more years from the same roots; and sugarcane will, I am told, yield crops for twenty-five years without replanting.

All bananas intended for export are cut green. There is not a bit of yellow to be seen in any of the fruit when it is shipped, and it takes a week or more before such bananas are ready for eating. There are packing sheds along the coast throughout the plantation, where the bananas are put into lighters and carried to the central station to the steamers. Four days after that they are in New York, and within two weeks are on the breakfast tables all over the country.

Pineapples and Oranges.

In another part of the estate pineapples grow between the bananas. They seem to do as well there as in the open. Indeed, I saw pines by the thousands as big as a man's head surrounded by red and green cactus-like leaves. In another part oranges grow among the bananas. The orange trees are of a rich green. Many of them are pure Cuban, but thousands are budded from the best of the Florida and California varieties.

Later I crossed the bay to the Tacaje plantation, which also belongs to this same company. This contains 36,000 acres and it has even more bananas and oranges than are on the Island of Saetia. I rode about twenty miles up and down the hills through the bananas there, and at times was so lost, in going this way and that over the plantation roads, that, had not the manager of the estate been with me, I might have ridden about for days and not found my way out.

Four Thousand Acres Kept Clean.

These millions of bananas and pineapples and the hundreds of thousands of orange, coffee and cacao trees were a wonder to me, but the greatest wonder of all was the fact that they have all been planted within the short space of four years, and that four years ago the land on which they stand was a jungle of forest, more wild than any part of the lower Mississippi valley. Within that short time these 4,000 acres of woods have been cut, cleared and made into a farm more clean than the finest rose garden in the United States. The woods were cut and burned over and the plants, without plowing or a bit of cultivation, were set out in the ashes. Since then not a plow has been used and the only tillage has been to pull out the weeds and dig the grass. Today in all the cultivated portion of the estate there is not enough grass to give one meal to a good-sized goat and there are absolutely no weeds whatsoever.

All Piece Work.

The plantation is kept clean by contract, each man being allotted as many acres as he will care for at from 50 to 75 cents per acre per month. One man can keep clean about forty acres. This nets him from $25 to $30 per month, and he has time to make extra money by cutting cane or bananas or doing odd jobs about the place.

All of Mr. Dumois' work is done by contract, and his men make from $30 to $40 a month. The man who does not keep his tract clean is fined and if he slights it much he is discharged. Inspectors go about regularly to see that the work is properly done. During the thirty or forty miles' ride which I took over the property I saw no gangs at work weeding, although I did now and then pass a boy pulling weeds out of the roads and putting them in little bags to be carried away.

FRANK G. CARPENTER.

Commission of the First Governor of Iowa

Martin Van Buren

President of the United States of America

To all who shall see these Presents, Greeting:

Know Ye, That reposing special trust and confidence in the Integrity and Abilities of Robert Lucas of Ohio I have nominated, and by and with the advice and consent of the Senate do appoint him Governor of the Territory of Iowa and do authorize and empower him to execute and fulfil the duties of that Office according to law and to have and to hold the said Office with all the powers, privileges and emoluments thereunto of right appertaining unto him the said Robert Lucas, for the term of three years from the day of the date hereof, unless the President of the United States for the time being should be pleased sooner to revoke and determine the Commission.

In Testimony whereof I have caused these Letters to be made Patent and the seal of the United States to be hereunto affixed.

Given under my hand at the City of Washington the seventh day of July in the year of our Lord one thousand eight hundred and thirty eight and of the Independence of the United States of America the sixty third.

By the President:

M. Van Buren

John Forsyth Secretary of State

FAC SIMILE OF THE COMMISSION OF GENERAL ROBERT LUCAS, FIRST GOVERNOR OF THE TERRITORY OF IOWA.

THE original document is in the possession of the State Historical society at Iowa City. General Robert Lucas was appointed first governor of Iowa Territory by President Van Buren. The commission bears the date of July 7, 1838. This precious document has suffered very much from the lapse of time and possibly from lack of care during earlier years of its existence. Wherever blanks were filled with pen writing the ink has become much faded. In some instances even the printed lines are so worn that it is quite difficult to trace them. While the work is in some respects faulty, it is certainly as good as can be produced without a better copy, which at this time is wholly out of the question. It shows as nearly as practicable what the commission was at the date of its issuance. The Iowa State Historical society is making every possible effort to recover the commissions of Governors Chambers and Clarke, but up to this time without success. It is extremely doubtful whether either of them is in existence, and a matter of regret that they have not been preserved.