



ARCACHON—ON THE BAY OF BISCAY. A GREAT RESORT WHICH DEVELOPED AFTER THE RECLAMATION OF THE LANDES OF FRANCE, CORRESPONDING TO MIAMI, ON BISCAYNE BAY, WHICH WILL DEVELOP IN A SIMILAR WAY WHEN THE EVERGLADES ARE DRAINED.



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From Conservation, 1909.

The Everglades

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Southern Florida

CHAPTER I.

THE EVERGLADES OF FLORIDA AND THE LANDES OF FRANCE.



DURING a recent visit to the great work of reclamation now in progress in the Everglades of Florida, I was impressed with its resemblance in many respects to the great work the French have accomplished in the Landes of France, and with the fact that ex-Governor Broward, after many trials and tribulations, is succeeding, just as did the French engineers after similar troubles. This also applies to the work of Enrico Dalgas in the reclamation of the Heathland of Denmark.

The drainage of the Everglades is now well under way, and almost every unprejudiced person who visits this work becomes an enthusiastic convert. Just as the French engineers practically added a new province to France, Broward has been instrumental in promoting a work which will convert a vast, useless waste into what promises to be the most productive part of Florida, if not the most productive area of land of equal size in the whole United States of America. This drainage is being done at the insignificant cost of about \$1 per acre; and when done the land will be ready at once for the plow and for the production of tender crops, the like of which cannot be produced elsewhere in the United States, and at a time when the rest of the country is frost-bound. This is no small area; it is many miles in extent, and is capable of yielding, at small outlay, enormous crops of the most delicate tropical products, as well as Northern

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vegetables, in midwinter. A visit to this region, even at this time (May, 1909), at the very beginning of the work, since it is a colossal task, will convince the most skeptical person that this is no idle dream or wild land scheme, but a feasible, practical piece of good business. After inspecting this work, one naturally wonders why it was not done long ago. It is not a complex engineering problem; it is merely a matter of digging, so that



NATIVES OF THE LANDES OF FRANCE. A REGION RECLAIMED BY DRAINAGE.

the water in this great Everglade basin can flow into the sea. Behind the giant maws of these dredges which, when they work day and night, are literally eating their way through rock, mud

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and sand at the rate of a mile a month per dredge, there are left broad, navigable canals, which are comparable only to those of Holland, and which will afford miles of placid water courses, avenues of traffic for the products of the land, and a never-ending source of enjoyment to pleasure craft.

In the case of the Everglades, the exit of the water to the sea is prevented by a limestone rim. In the case of the Landes it was due to a bank of wind-blown sand, which clogged all outlets to the sea. The resemblance of the two conditions is much closer than is at first apparent, since this very rock rim was



A SCENE IN THE LANDES OF FRANCE BEFORE RECLAMATION. THE NATIVES WALK ABOUT ON STILTS. (PHOTO OF AN ILLUSTRATION IN AN OLD FRENCH GEOGRAPHY.)

once, no doubt, limestone sand blown in by the wind and later hardened into rock. I think geologists now generally recognize that this rocky rim is of eolian formation. The main difference between the two propositions is that, in the case of the Landes, it was silicious sand, which did not harden into rock, but re-

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mained mobile, shifting back and forth with every caprice of the wind, while, in the case of the Everglades rim, it was limestone sand, which soon hardened into solid limestone rock. As in sand dunes, the wind laminations show in the rock like leaves in a book, recording forever the character of its formation. Some distance up the Coast, in the great pineapple district of Eden and Jensen, the obstructing dune consists of silicious sand. Southward the rim is not pure limestone in every instance but a calcareous sandstone, that is, granules of silicious sand cemented together with lime.

Before further describing the Everglades, let me quote from my notes made a few years ago, while visiting the Landes of France. Not only are the physical conditions similar, but there was the same opposition at the start. As in the case of the Everglades, the work in France was pushed by the personal initiative and persistency of one or two men, and the method of securing the funds for the purpose was very much the same. In the early part of the last century (before 1857), the condition of the flat, triangular plain known as the Landes, which is roughly bounded by the Bay of Biscay, the River Adour and the River Garonne, and the Medoc, was, in brief, as follows: There were miles of marshy, almost treeless wastes, covered mainly with a low growth of herbage. It was wet, unhealthy and sparsely inhabited. The few people who lived there depended upon their flocks. The accompanying picture shows a native of the Landes standing upon stilts, watching his sheep. He is dressed in a heavy sheepskin paletot. By standing on stilts, these shepherds can easily see their sheep in the bushes and grass, and can easily follow them through wet and marshy regions. Their spare time is spent in knitting stockings. The condition of the Landes is due to the immense sand dunes, which arrayed themselves along the shore of the Bay of Biscay. They moved inland, covered villages and occluded inlets. Bremontier tells of a dune which advanced in a violent tempest at the rate of two feet in three hours. The damage done by these moving sands so increased that the government officials studied the work and devised and executed plans; and now, thanks to De Villers, Chambrelent and

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Bremontier, the pioneer workers, the Dunes and Landes are covered with a beautiful growth of the maritime pine. The region is now a famous health resort, combining the beauties and pleasures of the seashore with those of a well-managed pine forest, which extends almost to the edge of the ocean.

There are evidences that originally the Dunes were fixed naturally by forests. These forests were destroyed by vandals, and all attempts to stop these menacing mountains of sand failed. In 1778 a talented engineer, Baron Charlevoix de Villers, was sent to Arcachon for the purpose of forming a military post. He saw at once the necessity of fixing the sand, and was, according to Grandjean, the first to establish the fact that the way to fix the Dunes is by means of plantations of pine. He met with troubles in his work, and was finally sent back to the Island of Santo Domingo.

In 1784, Bremontier began the work, and it is said that, by using the results of De Villers' labors, he finally succeeded in fixing the moving sand.

The fixation of the Dunes rendered possible the work of M. Chambrelent, which was the reclamation of the Landes by drainage and plantings. It is a unique example of personal initiative. M. Chambrelent, a young engineer in the Department of Bridges and Roads, in 1837, was sent to the Gironde to study the drainage of 800,000 hectares of land in the districts of Gascony and the Landes. His conclusions were not accepted, so he bought some land and put in effect the measures he advocated. In 1855, the results of his experiments were submitted to an international jury. The jury was so favorably impressed that it recommended the application of Chambrelent's plans for the entire region, and in 1857 a law was passed requiring the Communes to do this work. The Communes paid for it by selling a part of this land, which increased in value after the completion of the work. This region was 100 meters above sea level, flat and sandy. It was underlain with a hard-pan called "alios." In summer it was a bed of burning sand, in winter in a state of constant inundation, while between the two was a period of pestilence. The country was characterized by sterility and insalubrity.



TAPPING A PINE FOR RESIN IN THE LANDES OF FRANCE. NOTE THE CUPS TO CATCH THE PITCH.

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A complete system of drain ditches was dug and the seeds of pine were sown. In 1865 all works of drainage were complete. By the fixation of the Dunes and the drainage of the Landes 650,000 hectares of land were made productive. Formerly, if one wished to buy land he mounted a hill and called in a loud voice; the land over which his voice carried was worth 25 francs. "A man," says Grandjean, "was forced to take some of this sand for a debt. He became a millionaire later by selling it in small parcels." The first summers, the visitors lived in the resin-gatherers' cabins; now every luxury is afforded the 200,000 tourists who come there every year. In the Landes a man could buy a farm for a few francs, but it required over two acres to support one sheep. In less than a century the population sextupled, while that of a large part of the rest of the country either remained stationary or decreased. The fecundity of the French in places where there is plenty of room and opportunity is proverbial, as in Canada; it is even so in the Landes, which, on being reclaimed, was equivalent to a new province or colony.

All along the East Coast of Florida there are dunes of snow-white sand covered with scrub pines and palmettoes. This fine, white, silicious sand, although naturally sterile, is excellent for the growth of pineapples in regions where there is sufficient warmth. Mile after mile of this sand along the line of the railroad between the Everglades and the sea is used in the cultivation of pineapples, which are fed a balanced ration of fertilizer, just as cows are fed a balanced ration of feed for the production of high-grade milk.

The great Everglades basin, extending from Lake Okeechobee to Miami and westward to the Gulf of Mexico, contains 3,000,000 acres, more or less. The whole cultivated area of the State of Florida is estimated at only about a million acres. The Everglades are larger than Porto Rico or Jamaica and as big as Rhode Island and Delaware combined. This great area is mainly confined by dunes of sand and ridges of limestone rock. These ridges, like fingers, project into the Everglades and are usually covered with pine. Between these ridges are small glades on the edge of the main or "big glade." The accepted definition

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of a glade is a narrow strip of grassy land between forests. Glade refers to a grassy area. The big glade is all or "ever" glade. In this way, no doubt, the term of Everglade originated. Here and there in the Everglades are islands covered with rich jungle or hammock hardwood growth. On these islands the Seminoles clear small areas, where they raise their crops.

We visited the Everglades from Fort Lauderdale. It was after a long period of heavy rains, and the mosquitoes were bad in the pine woods. We ascended the New River, a beautiful,



INDIAN FAMILY IN CANOES ON MIAMI RIVER.

winding stream, generally deep, but very deep in places, one spot having a depth of eighty-five feet. The banks were quite low and sandy and lined with moss-draped cypress, oak, maple, magnolia, coco-plum, pond-apple, etc. After a short ride we reached the beginning of the drainage work—one long canal ran north-westward, with the dredge Everglades, another due westward, with the dredge Okeechobee, at work. These canals will run about twenty miles out into the Glades and will be met by a canal running north and south from Lake Okeechobee to a point about

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twenty miles west of Miami. The dredge Miami is now at work at the head of the Miami River; another dredge is at work on the West Coast, opening the old Disston Canal into Lake Okeechobee.

As these canals are finished, dams are made to hold back the water to facilitate dredging, showing rather a surprising amount of fall and how effective these canals will prove in discharging the floods of water from this big area. I understand



A CYPRESS ISLAND IN THE EVERGLADES.

that the Government will permit the level of Lake Okeechobee to be lowered only four feet, since a federal appropriation has been made to dredge the Kissimmee River, which empties into the northern part of the lake.

There were no mosquitoes in the Everglades during our visit, and crops already growing on the land, owned by eager settlers, show what can be done on land only partially drained.

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Western capitalists mainly have bought this land; the money from the sales is doing the work, and the further it progresses the more the land will bring and the more eager people will be to get hold of it. The Board of Internal Improvement is wisely holding back much of the land from sale, knowing full well that as time goes on it will increase in value and thus yield ample funds for the continuation of this important work. In many cases the state has sold only the alternate sections.

There are agents at work selling this land in every State in the Union. Men of wealth and influence are behind this project. If any one doubts its feasibility, he should come to Florida and see with his own eyes. Much praise is due ex-Governor Broward for his work in this line, and in the years to come he will shine forth as the governor who really did something to add to the productivity and worth of his State. The man who makes two blades of grass grow where only one grew before is the proverbial public benefactor; but the man who, by his energy and foresight inaugurates a movement to render 3,000,000 acres of waste land highly productive deserves endless commendation in this day, when we talk so much about the conservation of nature's resources. Mr. Broward is a masterful promoter; the keynote of his campaign was drainage; he worked at it incessantly while in office, and he has been working at it ever since, and has made good.

We must not forget that this reclamation is in a land of perpetual summer in the only part of the mainland of the United States which is truly tropical, and where the productive capacity of the land is many times greater than in northern climes; where not only a greater quantity, but a much greater variety of crops can be produced than elsewhere in this country.

This may be far-fetched, but I can picture in my mind's eye long avenues of Eucalyptus, Australian pine and royal palms along these canals; great masses of Hibiscus, Allamanda, Oleander, Bouganvillea, Poinciana, and countless other resplendent ornamentals around thousands of neat homes surrounded by fields of peppers, tomatoes, eggplants, celery, onions, okra, arrowroot, tobacco, etc.; also, no doubt, orange and grapefruit groves,

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as well as choice mangoes, avocados, and other tropical fruits. The canals filled with boats will lead to Miami and Biscayne Bay, the Arcachon and Biscay of Florida.

The land of the moccasin, alligator and Seminole will see a great transformation in a very short time—it does not take long in a tropical country, especially on land where there is no forest to clear.

It is more than a drainage scheme, since by means of dams and locks the water table may be kept at all times just where it is needed for irrigation purposes. The land is level, fertile, and free from alkali and other injurious minerals. The canals serve the triple purpose of drainage, irrigation and transportation.

The soil is usually a black muck, in places several feet in thickness; under this is usually a layer of marl; under the marl, sand, and under the sand, limestone rock. There is considerable mineral matter mixed with this muck, and, although it will shrink some, I doubt if the shrinkage will ever prove a serious drawback. By the application of lime, the cultivation of legumes, etc., this soil can be kept at a maximum state of fertility, so that five acres would be ample for the support of an ordinary family.

The water of the Everglades is usually heavily charged with lime, which is deposited on the surface of everything in a fine, flocculent state during the period of overflow. This deposit, added to the muck, no doubt, contributes much to the quality of the soil. There are deposited also the shells of many fresh-water mollusks. In short, with the fertile, easily worked soil, an abundance of water for irrigation, a tropical, healthful climate, canals for transportation purposes, all within easy access, by both water and land, to our great northern markets, there is a combination of favorable conditions which probably cannot be equaled elsewhere in the whole world.

And lo! the poor Seminole; what of him? At best, he is merely a renegade; and the time will soon come when he will have to put on pants and go to work on the land, join his relatives in Oklahoma, or die from the effects of too much bad whisky.

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The following is a fitting tribute to the work of Broward from the *Atlanta Georgian*:

"Napoleon B. Broward, the beloved Florida statesman, whose untimely death took place a few days ago, was the apostle of reclaiming Southern swamp lands—a pioneer in the work of saving the great inundated tracts to the productive resources of the South.

"It was the dream of his life to do this for his State—to change the hundreds of square miles of the Everglades from a dreary waste of bog and morass to gardens teeming with fruits and vegetables—to make two useful plants grow where none grew before.

"It was a dream worthy the best quality of constructive statesmanship. He not only dreamed this dream, but he set about to put it into reality. He took it and his plan for its realization before the people of his State.

"He met with cries that the builder always meets—'It can't be done. Drain the Everglades? Absurd!'

"But the people had faith in him and his policies and they won. He was elected governor and secured the necessary legislative enactments to put his plan of draining the Everglades into operation.

"It has been a success. Its effect is the same as if some great fertile island were gradually rising out of the ocean to add itself to Florida's riches. It is an ever-increasing source of income direct to the State and a source of additional thousands of inhabitants and additional millions of invested capital.

"In anticipation of its progress, land now under water and a few years ago worse than worthless is now selling for prices that are remarkable under the circumstances.

"Broward was a pioneer in a movement that is going to mean much for every Southern State. In the South there are 87,000 square miles of swamp lands. In Georgia alone there are 4,210 square miles or 2,694,400 acres. Making these lost acres serve the use of man and the good of civilization is a worthy task. Broward, the pioneer, has pointed the way. Let the leaders in every Southern State follow it."