

U.S. Dept of Agriculture.
Office of Experiment Stations.

Report on Everglades Drainage Project in Lee and
Dade Counties, Florida.

January to May, 1907.

by

John T. Stewart, Drainage Engineer.

Instructions from J.O.Wright. Object and purpose of survey

1. To determine the topography of the country south of township 41 to locate proper channels to carry overflow.
2. To determine approximately the extent, area and character of the water that drains into Lake Okechobee so as to calculate the discharge capacity.
3. To determine depth of muck and locate rim of stone circle.
4. To make plans and estimates of a complete system of drainage.

May 18, 1907.

(Lewis A. Jones,

Soil Conservation Service, (USDA.)

Kindness of Mr. ~~xxxxx~~ John C. Stephens
705 Sweet Bldg
Ft. Lauderdale, Fla.

Official connection begun Jan. 17. Previous to that time Ft. Myers, had been local headquarters and the route for two lines of levels from Ft. Myers to the vicinity of Brown's Stoe and thence one line across the Everglades, had been determined. Paul Funderhide, levelman. Mr. I.S. Singetary, of Ft. Myers, gen. asst.

January 20. Ft. Myers. No. of tourists in town. \$2.50 a date at Bradford hotel. Dr. Precht for special info. \$6 a day asked for ox teams H.A. Hendry, hardware, and H.E. Heitman, grocer, best outfitters.

Jan 22 to 27. Saddle horses, \$1.50 a day. teams, \$5, plus teamster who would cook. Est. a tide gauge at Ft. Myers. Brett left Myers at 8 a.m. for Labelle with outfit; Lawrence Brett, levelman, E.W. Chadwick rodman; J.R. McLeod, axman; and Marvin Carson, teamster. Mule team wagon, 9x9 tent, camp outfit and 25 days rations. Friday ran levels from bench mark to the tide gauge. Funderhide began work Myers Sat. am. left town at noon made first camp 6 miles out on old military trail which runs to Immokalee. Made reconnaissance from Myers via Immokalee Brown's Stoe, Travers House, Labelle and back to Myers.

Weather warm and pleasant, heavy fall of rain. Improved sandy roads. (Freight rates high. Everything had to be shipped in.) People are anxious to have something done to prevent overflow of Caloosahatchee river.

Singetary writes notes. Raised S. Fla. resident Lee County 32 yrs. Cattleman, hunter, guide, county assessor, timber estimator and ~~xxx~~ surveyor.

Pine Timber land. Virgin forest of flatwood pine. Pines tall and straight, branching near top, 50 to 100 ft. tall, 80 an average. Saplings to large trees 3 ft in dia. majority 15 in. through, 4 ft from ground. Pine forests interspersed with flag ponds, popash heads and long open sloughs 600 to 1200 feet wide, mile or more in length but no springs or brooks. Soil sandy. Wire grass for grazing. Pine dry

when country wet so pineland means high land.

Cypress timber land is true swamp. (Note Davis jr. contradiction of this.) Cypress, pine islands, saw grass and willow ponds. Prairie-- open flat land covered with wire grass and saw palmetto dotted with heads of oak and cabbage palms and pine islands. Grass good grazing generally burned off in Jan or Feb. and by March first cattle find new green. May 1st fat and ready for market. Water found over prairies in ponds--June to Oct-- full of water. Oct. to rainy, ponds shrink, spring, no more than water holes. Green food long after grass had dried out.

Saw palmetto beds-- universal growth. Sprouts of leaves or fans. 6 ft undisturbed usually 3 ft. Put of tips of thick rough roots 5 in. dia. which creep along on surface of soil to 9 ft. Bed burned off by hunters. Roots uninjured. Hard to walk ride or drive over. Cost of grubbing 415 an acre. No indication of water.

Pine islands-- 30 trees to hundred acres through open prairie and cypress country. Soil, high dry, sandy and unproductive. ?)

Hammock. oak and cabbage palm and absence of pine. Dark loamy sand, most fertile.

Cypress heads. isolated clumps in low land. Cypress growth small.

Ponds---every depression a natural reservoir. Grasses make rich muck. each grass separately.

Saw grass pond--2-12 ft. muck or marl. Often so rank as to be impenetrable. Rows around the edges of other ponds.

Popash pond or head. Very low--2 ft water in summer. Low scrubby tree not higher than 25 ft. Clusters. 12 branches from single root. Spaced well but so thick no other vegetation underneath. Air plants but no moss.

Flag ponds--fire flags-- lily 10 ft tall. leaf like

banana. Indicate rich low soil. Lily flags-- pond lily of north. open ponds-- sand or muck.

Maiden cane ponds--sand or muck but usually white sand. So t sweet ~~xx~~ water at depth of few feet. Tall slim and graceful grass, of which cattle are fond. 2-6 ft.

Grapefruit, orange, kumquat, leons--grow large i h coarse peel. "ativ Fla rough. Limes 200 to 400 boxes per acre, \$3 to \$5 a box.

Wages for farm hands--\$1.50 a day and board themselves. \$1.50 for horse and fed by owner. Rough pine lumber, \$17 per thousand feet. Dressed pine, \$20 to "25 per thousand ft.

Sugar cane--ave yield 8bbbls per acre sells \$.60 to \$1000 gal.

Rice-- planted latter part of May or first of June, usually not flood ed- raised on either pineland or hammock land, low hammock best. Land plowed and pulverized and the rice planted with a drill or sown brade broadcast. "here drilled it is plowed orhoed, is raised in tracts of 1 to 5 acres, cut with sicklemor scythe, bound in small sheaves and t the grain beaten out. Worth about \$2. bushell in the husk, the cost o raising one acre. One -half bu. grain one acre. One man and horse will plow an acre per day, also pulverize an acre per day and will pant or cultivate two acres per day. Two men will cut and bind one half and acre per day. Oneman will beat out and clean one quarter acre per day Sackscost 3 cents each. rdinary yield 50 bu. per acre.

Patsand rye, like rice, usud in the sheaf for fee.

Sweet potatoes, June or July or have been planted as late as August. Irish potatoes seed costs more and crop not so sure. "row on black la land.

Corn. raised in 5 to 20 acre field. 20 bu. per acre. .75 planted by March snapped early in August raised only for feed.

The only forage raised is cowpeas as pasturageand hay sown March to July mature in 3 mos. 2 crops a year.

Crab grass voluntarily used pasturage and hay. Worth one third less

than timothy. Two cuttings, July and October.

Pine.

Slash-- pitchy, used for lumber and turpentine.

Spruce pine grows in sand hills no value except for poles.

Cypress. White or black. Same uses.

Oak.

Live-- valuable. hammocks.

Waterm in low, not much value.

Oak on prairie, one to two ft. high. Acorns valuable.

Black jack, burr, willow and post oak, high land, no value except for acorns (mast.)

Cabbage palm or palmetto-- heart-- piling because durable in water.

Mangrove, button wood, maderia (sic) and wild fig. etc.

Wild animals.

Bear and panther still around Big Cypress cuntry. White tail deer, bobcats, coons and possum. Wild turkey, plume birds. Sandhill cranes around sloughs in pine woods. Duck, jack snipe and quail, around settlements and pineland.

Insects.

During the season horses are protected by coverings while range cattle gather in large bunches and pass back and forth among. Large black and large grey horseflies. Large yellowish but not so bad Deer flies around oak and mangrove swamps. Stock fly smaller than horn house, sores on cattle, never leaving. May cause death of uncared for cattle. Mosquitoes so bad even poultry has to be protected.

Overflows of the Caloosahatchee.

frequent during past 30 yrs. Highest water, 1878 but not much settlement then so not much damage. Sept. 1903 general overflow--serious damage to fruit growers and farmers along river valley. Field and garden crops drowned out and many of the citrus trees were killed. Water was over average surface of valley 3 to 14 days. August, 1906, overflow most serious damage yet. Water not quite so high as 1878 but remained on valley longer and had greater amount of property destroyed. Killed field and garden crops and citrus--came up to dwellings which had to be abandoned from 1 to 3 weeks water 3 to 5 ft in valley. The residents earnestly desire a partial drainage and lowering of Okeechobee ora dam to be constructed west of the lake which will hold the waters back.

Lumber and turp. No ~~lumber~~ t rp little lumber. Pine forests decreasing, pine products in creasing in value. Thought Lee Co pines would make good turp. orchards.

Pasturage-- free pasturage and native grasses are becoming scarce. Grazing and fires killing them out. Best in pine lands, prairies and marches--worth 50 to 75 cents an acre for grazing. If lands were drained, Bermuda, St. Lucy or Cuba grass could be produced. Cattlemen beginning to improve stock.

Improving land.

Cost-- acre heavy oak or pine land cleared ready for the plow--\$40 or \$50. Heavy saw palmetto and scrub oak \$25 to 35. Palmett roots must be dug up root by root. Fencing wire \$5 to \$7. Lands well suited to vegetables and citrus. \$200 to \$300 for one acre vegetables. Early vegetables very good.

Diary resumed.

January 28.

Left Ft. Myers 7.30 am in a light covered rig, driving two ponies. Forage supplies and camp equipment suff. for one wk. Passed Funderhide at work about 9am, dinner at 16 mile post. Following old military trail and stopped with Mr. Pawcum at Immokalee. Road very sandy. Made 32 mi. Singletary tried two shots with the rifle at a sandhill crane but missed. Timber very open, could see from one quart to half mi. One quarter of country seen during day was prairie. Sloughs both dry and wet. Number of cypress heads. Near Kennedy Carson's house there is a distinct channel washed out. Drainage southward, surface series of low ridges and sloughs, the sloughs forming rather indefinite channel. Cypress grows when deep enough. All cypress very small. Other timber slash pine. palmetto only undergrowth. Near Immokalee a rise of land covered hardwood undergrowth.

January 29.

Left Immokalee at 6.30 am and soon entered extensive prairie, sloughs full of water, small clumps of pine, a few hammocks, and patches of saw palmetto and cont. body of cypress to the south. Crossed the Okaloacoochee Slough at the "Widow McTane's", where she ~~ix~~ lived having a cabin and a few fruit trees. Slough bordered by thick cypress, app. 600 ft width, some very large trees. On through prairie cypress heads and hammocks to Leaning Oak. Rock Lake for noon. Rock Lake clear open body of water 1000 ft. dia. banks cypress so you can't see it until you are on it. Many white birds. Five miles road crooked. Wild turkey at dusk. Roost

Jan. 30

At dawn shot turkey. On road 6.30 small prairie cypress and hammocks. Walking ahead of team saw turker 200 yds away. Sat down in road and Singtary began calling. Turkey came to within 30 yds and I shot it. Country more open/ Sighted Mission at about 10 am and

and reached Brown's about 11 where had dinner. Two miles from Brown's Seminole Indian, John Pierce, got on to ride with us. Said desc. of Osceola. After Browns, he took me out in Glades in his canoe.

Glades in front of Brown's very open, small patches of saw grass, few hammocks with the water about one foot deep. Their appearance was much different than I had expected to see. Left Browns 2pm travelled n. 10 miles through open country, some cypress heads on left, pine lands and hammocks on right. Outcrops of limestone, one at Mission. Drove till dark-- no water. Camped Will Crawford's cabin. Had family-- looking after fences for cattlemen-- few fruit trees. Had hunted in Glades--said water from Little Cypress flowed north and south sometimes. Said there was a wide ridge in middle of Glades. Channels along east and west shores. East more brushy than west, heaviest saw grass near Okechobee. Canoe could be taken from Brown's along the west shore to Lake Hicpochee, thence through the canal into Oke. Jan. 31.

Left Crawford's 7 am drove n. no road open prairie. No islands. No water from noon to 2 pm. Shot a coon in a cypress tree. Through timber until 4 got trail of Brett's wagon. Fired shots to signal Brett. Cloudy with showers.

Feb 1. Left camp 6 am found Brett's camp 2 miles. Starting to run a line out into Glades. Left Brett's at 8 for Labelle. Lunch at Clay place. Country open timber to s. Fairly good road after Travers House. Line of level should be run from Travers House to Lake Hicpochee and another from bench mark 19 to west end of canal. Camped Labelle 4.30

Feb 2. Left at 6am. Drove through cabbage palm and pine timber and tall saw palmetto. Number of orange groves. Crossed Orange River at Buckingham, shell road to Ft. Myers. Frost last week in Dec. had injured all the groves. Small trees killed to ground--fruit ruined. All tropical, bananas and guavas killed. Country fences by cattlemen.

Fences run without regard to ownership, miles long. Man hired to patrol. Number of cattle --small variety-- no attention given to breeding. Hogs are allowed to run at large and often become so wild they have to catch them with dogs and load them into wagons. When not too wild driven out of timber by men on horseback. Not difficult to travel through country by zigzagging. Few settlers or farms.

Feb 4 to 6.

Ft. Myers. Preparing load of supplies to Mission.

Feb. 7. Left for Brown's store, teamster and 4-mule team, load 1100 lbs subsistence, 1400 forage and 300 pounds camp equipment and other material. 2 p.m. two whooping cranes (?) 3 more. Killed one. 7 quail. Killed entire bunch at 3 shots. Florida quail more white. Camp at sunset in Carson's pasture, 22 mi. Ft. M. Quail and breast of crane. Rode pony all day.

Feb 8. Left camp 6.30 am. Dinner, Okaloacoochee slough. 1000ft wide and 6 inches deep with slight current to south. Full of grass, no timber. Old causeway high had been built by the army. Walsh said he had crossed here when water ran into wagon box and hard to find dry place to sleep on. About 2 miles further on east passed junction of road from Widow McLan's which we had travelled on Jan 29. Camp at Weaning Oak. weather foggy with light clouds.

Feb. 9.

Left camp 6.30 am. Passed Crawford's place at 10 am/ road lay among cypress heads and hammocks. High water mark 12 to 16 inches.

Two camps--Mission. Men sick. Able bodied enough to make one crew.

Feb 10. Sunday. Visited Indian grave. Body was laid in small pen or box made of cypress logs and could be seen through cracks. Trapper named Graham wanted \$3.00 day for crossing the Glades. Was not anxious to go. (Drawing of Indian grave from photo.)

Feb. 10.

Brett, Funderhide and McLeod with two boats and supplied for 5 days went into the Glades. Graham said, "Water in Glades runs south, going out at Shark and Miami rivers. Have seen a good current 25 mi. north of the head of Shark river. At high water period saw same current throughout Glades. Think there is more fall south of Brown's than north. The water for 5 or 6 mi. west of Brown's drains se into Glades. During rainy season all prairie is covered with water; hammocks, pine land and saw palmetto patches are usually above water but all the rest covered. Have seen the Glades dry. Can go from Brown's to head of Shark River in a boat during high water period, Sept. to October being best months."

PM rode along edge of Glades. Visited ruins of Sam Jones' Old Town and another Indian village. ~~Waterxxxxxxx~~ Weather clear but windy.

Feb. 13.

Nights said to be cool for this country. In company with Singetary and Mr. Johnson of the Mission made a horseback reconnoissance in the Big Cypress. Travelled about 12 mi. east of south. Visited ruins of old Ft. Shackelford. Nothing remains. The Indians have had a shack near the site and their poles are still standing. The fort was one hour's ride from the Mission and was located in a small pine island in the center of a small prairie bordered by cypress. SW of Fort we entered the Big Cypress by crossing a narrow strand of it. Then followed a series of pine islands and prairies. Another hour to Dixie's camp. Dixie's mother was a negro captured in the Indian wars and his father a Seminole. Two huts, no one home. On return found mother and wife, a Seminole. They gave S. a large piece of dried venison. Two hours ride to west end of Cow Bone prairie. Too boggy for horses. Travelled ~~afst~~ a foot for 2 mi. following Indian trail. Wading number of sloughs came to quite a large Indian camp on a hammock surrounded by water.

Old squaw and two young squaws refused to talk. Looked as if we were on a bay leading i to Glades. Two large canoes at camp. Heat camp-- tin and granite iron cooking vessels. Owned a no. of hogs. Leader wore a bell and were being fed palm cabbage. Did not reach our camp until after dark/ Chadwick fired signal shots on our approach. Wagon could have been taken over same distance with very little cutting. Walk and lead horses through bog. Prairies and pine islands small separatele by cypress strands having se direction. Drying swamp but in west season little dry land. Rock seen in no. of places Sheet limestone. Under vegetable matter in the cypress strands.

Feb . 14

Col ected soil samples near Mission. Mission consists of a section of land, a 6-room frame bld used as hospital, two stories high and a and a small dwelling house on a hammock. W.J.Godden only person officially located. Seminole M ssion and Hospital, Glade Cross, Lee County. PO Immokalee. Dr. Godden had two books which related to the history of this country and were quite interesting. Green's School History of Florida, by Edwin L. Green. and The Red Patriots by Coe. PM. Carson and I rode to the nw. In passing a slough Carson noticed alligator sign. He grunted up the gator which I shot, after which it was rogered and skinned by Carson. Local hunters had agreed not to work for less than \$3 a day.

Feb. 15.

String of hammocks 3 pr 4 mi to nw. Rock outcropped continuous String of hammocks parellel to edge of Glades and 3 or 4 mi from it. Easy to walk through cypress and popash heads after passed fringe of under growth. Boggy around a small alligator pool mostly mud--muck. Rough limestone, basin shaped with rim 2 inches high. Following gen'l facts true of the country north of Big Cypress and west of the Everglades.:

*prairie lands and pine woodlands are annually burnt off by cattlemen and farmers. This fire destroys all dry vegetable matter and leaves the sand bare. In the ponds which are too wet to burn the vegetable matter accumulates and forms muck. The fire also kills young pines. If the surface water could be drained off and the fires prevented, it is believed that the prairie lands would soon be covered with pine, as a no. of young pines were seen at various places in the prairie which have been missed by the fire.

Hammocks are above the high water line. Saw palmetto beds usually above. The more vigorous the growth of palmetto the drier and richer the land. Pine woodland seldom overflows (sic) Cypress woodland is swamp under water the greater part of the year. The continuation of a long prairie is often a cypress swamp. It is not uncommon to find a circle of cypress, then a circle of saw grass and then an open pond or a fire flag pond. Saw grass grows in shallow water and in a dry time a saw grass pond is a poor place to look for water. Ponds, sloughs and land which is sandy or which have a sand bottom are not boggy when wet. The amount of muck lands in the pine and prairie regions is very small. From marks on tree high water is about 2 ft. above bottom.

Alligators often dig quite a deep hole in the center of ponds during the dry season so that water is held in a pond that would otherwise go dry. Those holes may be three feet below the average depth of the pond. It is probably that 4 feet would cover the range from the top of the hammock to bottom of slough, the average surface being about midway betw. the two.

Feb. 16.

Stock all changed, team horses being left in place of mules. Dr. Godden digging water hole near Mission. Water table very close to surface, water coming in rapidly out of sand, which caved easily when hole was dug but otherwise quite solid.

Feb. 17 Sunday.

S.R. Anderson, who claimed to have spent much time in Glades was in camp over night. He said, "The current in the Glades runs south and west. Streams on east side give a current to the east. There are a number of small hammocks along the east side north of Deerfield, also around the head of New and Miami rivers. The heaviest saw grass is along the s. shore of Lake Oke. etc.

Feb 18.

Hired Anderson to go into Glades . 8 am Brett, Funderhide, Chadwick, McLeod and Anerson left Brown's with three boats and two weeks supplies. Photoed Brown's and Wilkinson's stores. The saw grass at the surface of the water or ground has a stalk or stem about $1\frac{1}{2}$ inches in diameter. It immediately branches out into 12 or more blades. These if flattened out would be about $\frac{3}{4}$ in wide but in place of being flat has a bend in the centre rib which gives them a v-shape. The blades become very small at the top and bend very slightly. The new blades come up from the center while some of the outside and lower ones die. Rather a heavy stalk is sent up out of the center which apparently flowers and seeds and the entire plant dies. The saw is a row of very fine teeth which grow on the blade. These teeth are set forward and when rubbed toward the top are not felt but when rubbed backward will tear and cut. The average height of this grass is about 6 ft although it is said to grow 15. It is no harder to get through than the wide bladed slough grass in the north. It grows in muck or marl land and when the water is shallow or dry part of the year. When there are dead blades among it, it burns readily with considerable noise and a very black smoke. The blades

the blades burning off to the stem near the ground. Growth indicates boggy or mucky land. Often buried by alligator hunters. People travelling in Glades cut and pile it up above the water line to sleep on such a bed being called a gator's nest. Brush scythe or machete best tool.
Feb. 19.

Rode 14 mi. so and two east of Mission. Site of large deserted Indian camp and two lines of fence posts. Too boggy for horses, walked to timber. Solid line of cypress south, a large open prairie running to east looked as if it ran to Glades.

Feb 20.

Allen heard a turkey gobbling near the camp about sunrise which he shot. Rode out 2 mi from camp as far as horses could go. Followed an Indian trail on foot. Trail became larger near cypress, branch trails.

40 mins. wading water through cypress found Indian camp, 4 squaws, 5 children, 2 boys one man Phillip Billy who told us we were at camp where
Deserted camp his.
Dr. Tommy died. Cypress swamp directed connected with main Glades. Indian said 4 mi to open Glades, continuous water. South of Browns south line of township 50. One of the team horses became bogged in a cypress strand. Rolled him over, padding his feet with airplants and gunny sacks and made roadway of palmetto leaves. 4 men 2 hours. Horse unhurt. Moved camp north. Trails east and west leading to nothing but swamp.

Feb .21. Fred Crawford at Mission said,

"That Indian camp was in a cypress bay of the main Glades. wagon trail from there to Squirrel Pens. Tom Roberts of Miami one of best Glades men in country. Flood water from north of his place drained ne while that south ran southeast to Glades. Thought west divide of the Glades was near pasture fence east of Okaloacoochee Slo gh.

picture Sem. woman. large checks of skirt. Two ruffles around knees. Short ruffle below shoulders, long full sleeves. Many silve disks. Fine figured calico ruffles. Bangs.

Brown said Ashley boys of Pompano had hunted a great deal in Glades and were reliable. Where saw grass is kept burned off it does not grow so rank. that during the past 6 yrs. he handled 50,000 alligator hides.

Feb. 28.

Started for Ft. Myers on horseback. Rode nw from Mission along a line of hammocks which ended about 5 mi out. No rock after. Sheet rock a continuation of outcrop from near Mission and s to township 50 s line. 6 miles out passed prominent mound. Hendry's flowing well. 3-inch pipe running full, water strong of sulphur. Hampton's at 2.30 hammock, citrus trees and bananas. Prairies, sloughs, few hammocks. This is Devil's Garden. All supplies carried were small piece of bacon, dried venison, biscuit and coffee in saddle bags no bedding except saddle blanket. No one home, Turned horses into Daniel's pasture and made supper. Coffee in empty tomato can. Fire of pine wood and slept, getting up through night to replenish fire. Burnt half saddle blanket.

Feb. 23.

Venison and coffee for breakfast at first light. Rode west through open pine woods. Christian's place 130. Rode s. to Kennedy Carson's. Smoke from many fires in woods. Set by hunters or cattlemen.

Feb 24 Sunday.

Main road to Ft. Myers.

Feb 25 to March 18.

Water in Glades falling. Sent instructions to Glades party to work in Big Cypress. More help needed to pull boats. Worked in Glades. 4 Mar. party consisting of Brett, Funderhide, Chadwick, McLeod, Anderson and Allen left Brown's to continue Glade line with intention of going through to East Coast. Singetary with one other teamster brought team back to Ft M. March 8 made river trip from Ft. Myers to Ft. Thompson and March 12 went to east coast by West Palm, Ft. Lauderdale and Miami.

Information acquired.

Mr. William Wilson, Buckingham, Fla. Supt of Travers Orange Grove.

Chainman on Ingraham exped. crossed Everglades from Sam Jones Old Town to Miami in 1892.

see tht narrative no current perceptible.

Travers orange grove. 35 acres--steam irrigating plant.

One 3 inch main and four 2 in laterals laid 200 ft apart. 50 ft hose pressure eno gh to throw water 60 ft from nozzle. 2 in hose, 1 in. nozzl 22 horsepower vertical boiler, $\frac{3}{4}$ cord pine wood in ten hours and duplex 10 x10 piston plunger pump. Water taken from \checkmark range river, surface 6ft below surface of Grove. Plant will irrigate 4 acres in 10 hrs at cost of about \$10. To run 2 nozzles, 3 men at \$1.25 a day and one man to tend pump and boiler. Wood, \$3.00 per cord. Plant second hand at \$1400. Now would cost \$4000. Used 7 yrs. Pipes laid 10 in. deep plugs every 20 \checkmark ft. Paid for itself. irrigate one to three times a year.

Have had good drops in dry years when nearby groves partial failure. Irrigation saved trees after frost. If ground dry they will dry but with irrigation keep going. In irrigating, water thrown up through trees. \$8000 worth of fruit past season. \$5500 profit. Drainage ditches 2 ft in deprh. where there are no rid es requiring deeper cut to get fall. Ditches need cleaning every year. sand 12 to 18 in. deep over marl \checkmark rang river overflows in times of excessive rains but does no damage.

J.F.Shands, country surveyor and Sup, Lee County schools. Ft. Myers. March 2.

Naples is only point in Lee county and is one of three points on west caost where there is a bluff at the edge of the Gulf. Ridge cover ed with oak begins 12 mi south of Myers on the Naples road s with few depressions and flats to Henderson,s creek. RiseWater rases and flows s along this ridge. Estero and Survey creek nearly alike. Rise in cypress a and flow through ridge. During the low water period and at high tide there is no fall in these creeks which is true of all streams flowing west as far south as Cape Sable. To improve channels would need to be

widened but not deepened. Survey creek is the natural outlet to Lake Trafford and a channel could be constructed to that point. In the low water period there is a back current in these streams when the tide is rising. There is a slight divide beginning at Lake Hicpochee and extending near Rock Lake to the Shark river, separating the Big Cypress from the Everglades. but at time of high water the water in the Everglades and the Big Cypress is thought to be continuous. "early the entire surface may be covered over with a thin sheet of water in the rainy season. Floods will kill wild grass and young timber and object is drainage is to relieve ground of water that would lie on a long time. No especial benefit to drain Glades except around Lake Oke only one tenth of the country could be cultivated if it were drained.

Dying vegetation very rich in Big Cypress. Nothing but climate. South of the Caloosahatchee cold never did serious damage. No entire crop destroyed. Frosted but that's all.

Only one band of sheep kept in county sheered twice a year and doing well.

W.A. Roberts, timber estimator and land locator, Ft. Myers.

Deepest part of cypress near Deep Lake. Shark river has rocky channel and swift current at head in high water season. At low water tide runs nearly to head where channel suddenly disappears into Glades. At high water have travelled by boat 30 mi. ne of the head. Big pine island near head of Shark river.

Rock in Big Cypress 12 to 18 below surface often on top in prairies and pinelands.

Capt. Fred Menge, Ft. Myers. March 3rd.

Had charge of the dredge for the Disston Co. Machine a Menge bucket dredge. All excavation in muck. Cut channel 7 ft deep, 20 ft wide with vert banks. Ave 220 ft a day or mile a month. One day 60 ft. Ten hrs a days work. Burned cord of wood a day. Tests made on growing qualities of muck. Would raise good corn but rice was all straw. If Everglades

drained it will require a system of gates and dams or some method of irrigation to prevent soil from becoming too dry. Ave depth Oke 12 ft. It could be lowered four feet below low water without injury which would bring edge of lake to edge of present vegetation line. Lake should be use as reservoir during rainy season. Muck could be used for levee water wou not percolate through if not too high.

No hammocks near Oke. rocks raises to south at south side of lake. 12 to 15 ft to rock. 13 mile canal was in a continuous reach of saw grass with little open water. Saw grass often 12 ft in height. Material excava ted was stringy, rooty stuff would barn if dry and did not cave after. J.E.Brecht, Ft. Myers. Formerly Indian agent at Immokalee. Locating Indian lands. Only the hammocks between Immokalee and Brown's of any value. Other land too sandy and rocky. The draing of the Everglades wou remove the barrier to the east winds which often causes freezes on the East Coast and are prevented doing damage to the west coast by warm moist air of Everglades. Hardpan is poisonous to vegetable growth if roo reach down to it.

Capt. Hendry, Labella, Fla. March 8.

Lived in country many years, raised cattle. Lake Oke stands higher than formerly (?) old pine stumps around. Lake could be lowered five ft without injury. Head of Caloosahatchee about five mi west of Lake Ric.

Stared with Times Mem. exp. to go south through the Glades but left at South Bay and travelled south to Shark river. Custard apples look like apple trees. Saw grass will be killed if it is cut or burnt off and the water rises as it cannot start to grown under water. Stafford Powers of Fort Menaud has found a sand mound in the Glades a mi from the s shore of the Lake. also located a large open channel running to the southeast.

Caloos. from Ft. Menaud to Ft. Thompson very crooked. Steamboat is turn ed around the bends by the aid of a push pole and two places where it is necessary to use ropes. An entirely new channel would be conomical f

as to attempt to straighten present. greater carrying cap.

Over flows in the valley stand from 1 to 4 ft deep and last from 10 to 20 days and extend down ~~from~~ between Rialto to Alta. Steamboat capatians says river banks are widening but that the channel is filling up and bars are forming. Caused by wash from steamboats rather than erosion during high water. 25% fruit crop damaged by the December freeze. Half crop picked when freeze came and ~~was~~ half the rest damaged. No trees over 7 years killed. Flood which lasted from 15 to 20 days in Sept, the cold in Dec and the dry weather afterward had been hard on groves.

Spt of Garvey grove thinks wind drives water westward out of Lake Oke which is cause of overflows into Caloosahatchee. Canal could be left open

Steamboat agent at Sanford said that during very high water the ~~is~~ flood from the Kissimmee came over into St. Johns. Fall from Sanford to mouth of St. Johns only 4 ft. 10 inches of tide at Palatka.

W.R.Moses, West Palm Beach, secy of Ingraham exp. No levels were run. Muck three to ten ft deep. Would all burn if dry and would require some system of irrigation. Ingraham exp. crossed at very dry time.

Frank Stranahan, Ft. L. New river overflows. Lasted for a month in 1906 The banks are higher than the land a short distance back. Rock ridge was shot out at head of New river. Since then much land has overflowed which did not before. Tide runs back nearly to Glades and salt water has been up in cypress. There are many places in the Glades which will hold water and many places not worth draining.

Resident of Delray does not want Glades drained. They prevent frosts and cold winds from north west.

J.S.Frederick, Miami. Surveor.

Thinks there is a ridge in the Glades which divides the water. Better to open all little streams in Glades than large one. Should drain south east and southwest. ~~Had~~ all fall to the south. Where small streams cleared out big improvement in drainage. Pool at head of Miami

river is 6.75 above high tide or 8 above low tide. Snapper creek is partially subterranean. Ran a line of soundings on township line 6 miles north of Miami, 13 mi west into Glades, much ave. $1\frac{1}{2}$ ft deep. Often wide strips of sand and rock. In Miami basin 6 mi south there is a good bed of muck.

S.H. Richmond. Miami. March 16. Agent for Perrine Land Grant. Glades below Miami rocky and not of much value. Inlands like atolls surrounded by rim of rock. Timber fires every year good thing. Kill snakes, flies and mosquitos.

The Miami river is smaller than the New. The tide runs up to the river. Rapids very short and rocky and only a small amount of water running over on March 15th. River 50 ft wide at foot of rapids and disappears inside of $\frac{1}{4}$ mile going up. Widens down. banks are low. Two ft above high tide and overflow at the high water period. Several branches of river between rapids and numerous small hammocks in sight from land.

Newman engineer for State on the dredge boats says that he ran levels from Miami west. The pool at the head of the Miami river was 6 feet above high tide and for the next ten miles there was a uniform rise of 3 in per mile. The next three miles were level. The grade of the state ditch is three inches per mile and the ditches are intended to be ten feet deep and 65 ft wide. Some of the rock in the ditch is quite hard and is being blasted.

- - - - -

Before leaving Ft. Myers I decided to make a trip into the Glades from the east side to meet the Glades party and get a personal knowledge of the eastern Glades. Stopped at Ft. L. on the 14th for the purpose of employing one of the Ashley boys who had been recommended as exp.

Gladesmen. John Ashley employed in the state dredge. Ready with canoe and outfit on the 19th.

March 19. Left Ft. L. 7.30 Towed up the North Fork by a gas launch

until the water moss became so thick it clogged the pro-eller, Banks of river low and timbered, pine coming down near the stream in several places Upper part of channel straightened by hand work. Had to drag the canoe through improved parts. Channel disappeared open marsh water low, bottom sandy. For mile no trail hard going. Had to pull canoe, sank into muck from knee to hip. PM water better. 4.45 camped nw of dredge smoke north of Pine island on edge of Glades. Grassy marches ran east in long strands and cypress timber ran west in long points. Travel in pm in channel or saw grass flat with open strands of water. Climbed tree saw smoke nw. Burning of heavy saw grass. NW more and more open water. Channels have growth small maiden cane, flags and white and yellow lilies. Water 1 to 4 ft deep and leads from 3 to 75 ft wide. Grass shows water has had current east of south leads crooked by genl direction east of s.

March 20. Left camp 715 travelled w by n. Shot mallard, limpkin and c. mouth moccasin. Three small fish jumped into canoe. Good water had to pull boat only two or three times. Open grassy lakes through which would run crooked narrow lead. From top of tree looked like brush land intersper with meadows and pools. One half just above water level. Bushes in islands 18 to 24 inches above water. Sand in bottom of deeper holes. fish. Crossed track of Glades party. five men had walked. Camped for night bay and myrtle island 50 ft dia. Center of island bay tree 20 ft height. 1 1/2 lb bass which ran out of channel into muck.

March 21.

E in morning following trail of Glades party too many dry saw grass strands. Finally found trail of 6 men. Felt canoe and work had been abandoned and party on way afoot. Found where fire had been on 19th. Decided to return to Ft. L. Stopped for noon ridge myrtles nesting long whites. Camped low wet myrtle ridge.

March 22.

Tried to get to Ft. 1. by South branch of New River but water so shallow had to back out and go by North fork. Had hard pulling. While

stopped at noon Ashley saw two small alligators. Located large one in cave a few ft from where we had landed but it would not rise to his grunting. Located it by running boat pole through the muck. Dug some muck away he ran pole down which alligator caught in his mouth. A. worked his hand down this pole, catching the gator with his fingers under lower jaw and by hooking a forked stick under jaw we pulled him out. Over 6ft in length. 2 pm met Indian in canoe who was going gator hunting. Saw what the thought was a bald eagle/ so it was a fish hawk and swam very bad. Hard pulling in pm. camped cypress head, very tired. These are higher than surrounding Glades.

March 23.

Led the boat for about 3 hr. with much hard pulling but usually a sand bottom. All deep holes full of fish, brim, sunfish black bass, gator, gars and dog fish. Early all the flags had attached to them above the water little eggs. (ampularia.) Poled canoe all way to Ft. L. no launch available. Poling slow work. Glades party in camp. Arr. Pompano 2 pm on the 20th. Run short of supplies, had sore feet, etc.

Mar. 25.

Up at state dredge to get permission from Byran to use Ashley until Glades line was completed. Hired launch went by water to Pompano down New River to Inlet, n. on east coast drainage canal. Canal does not seem to be of much value. Mangroves on both banks. Boat owned by Ashley enough to complete Glades work/

March 26.

Brett, Funderhide, McLeod and Ashley with two canoes loaded with 10 days supplies left Ft. L. at 8.30. Towed up New River by launch. Front canoe nearing sank. P.M. Shadwick and Allen ran began line of levels at Ft.L. which were to extend to Pompano; thence west into Glades to meet line coming from west. Water guag on rrbridge.

March 27 Miami.

George O. Butler-surveyor and tax ~~axsxsxsxsxsxs~~ collector. thinks lan

without Glades. Muck land will settle 10 to 30 % Three lines of soundings have been run into Glades between Miami and Ft. L. by Frederick, McDonald and Sheen. Profiles on file at Tallahassee. Rose state chemist knows.

Thomas Roberts, Miami. Water works out of Glades all along south coast and up coast to Chokoluske bay. Shark river good channel with long leads. Southern Glades very rocky. Ridge all the way down the centre which divide the water flowing east and west. Indian canoes best for Glades work. Nov. good month. Necessary to drain Big Cypress to drain Glades. Indians run west from Miami with gas launch at high water.

John Ashley, Pompanoa, Fla. said there was a lake about 7 mi long but narrow lying near the centre of the Glades south of Lake Oke. There is also an area of about 5 mi. square which has an elevation the same as high water. This area is covered with myrtle bushes and lies east and a little north of Browns. There is a series of myrtle and bay ridges parallel to and lying along the east shore. Some small heads extend out further. At high water we can go up east side to Jupiter and can go nearly straight from Lauderdale to Browns. Much floating tussock land on east side.

March 29.

Drove Walter Waldin's farm 6 mi west of Miami. Thick tall pine timber. Ridges and depressions more prominent than on west coast. Land rocky, timber grew right on rock. Holes blasted for fruit trees. Waldin's hammock at edge of Glades. Number islands further out. Glades soil muck-- irrigation plant consists of 8 inch suction centrifugal pump with 9 ft lift. Water from Glades ditch. Power 6 horsepower gas engine made at Marion, Ind. 1200 ft of flume 18 in wide. 12 in deep. Pump will fill a straight flume 18 in wide and 12 in deep 1 in fall per 100 ft. 4 men irrigate 4 acres in 2 ½ hrs. Water applied once a week. Pump will run 500 in 1 inch holes on a 6 inch head. Cold night Dec. surface temp. garden raised from 32 to 40 degrees in 15 min. Irrigates 100 ft on each side flume. As soon as water reaches end of furrow hole is partially stopped with small rock and just enough let out to keep furrow full. "and a

rig ridge hammock 8 acres in area. expects of levee and drain about 1000 acres.

Last hurricane came from nw and flooded all low land, injuring many trees. Land here sells from \$15 to \$1500 an acre. All lands are ferti- zed one half to two tons and acre costing \$27 to \$40 a ton. PM drove to Cocconut Grove. Punch Bowl and Kirk Munroe.

Many people near Miami do not want the Glades drained. Land enogh Also afraid it will cause climate to be a few degrees cooler and will cause coast strip to be dryer in dry season. they think Glades temper the nw wind nand subirrigate the land east. Nearly all the low land and the prairies s uth overflow at the high water period. Ridges more prominent east coast than west.

It isaalso the general impression that there is a wide saw grass flat which extends from Oke. to the southern end of the peninsula, nearly all of this flat being underwater during the rainy season but in the s part theif are leads where boats can get through at the low water period the deepest water being on either side of this flat. I am told Glades now practically dry. Grove in trucks lands suffering from drought.

Mar. 31 Tompano.Drove to camps through flat woods. Low places in timber cleared and planted. Mr. Marshall says the people want drainage. requires great deal of fertilizer. Palmetto bluish. great dewal of pine woods had been under water for short period. Boys occupying old Indian camp of Robert Oselola on noticeable ridge that lead to swamp that lead to Glades. Looked up route for line of levels.

April 1.

Chadwick and Allen started to run levels while I continues to examine country to try to find opening into Glades but it began to rain. Found practicable route.

April 2.

High nw wind which lasted all day and night and cont. through next day. Cut line for Chadwick to run levels. At noon fired the heavy

saw grass along the cypress. The grass was very heavy, higher than one's head with a coating of dead grass on the bottom. It was very hard to walk through as one could not see where he was going and the dead grass tripped the feet. The green blades would strike the face and feel as if they were sticking to it. When fired, it burned very rapidly with a black smoke and a crackling sound which could be heard for some distance. This heavy new grass was about a mile in width. It had evidently been covered with cypress at one time as there were many dead trees both standing and lying on the ground. Saw smoke of the Glades party from a tree.

April 3

Continued the line of levels out to the cypress island where late in the pm we set a bench mark and again saw the smoke of the Glades party. Thought they could reach this island the following day. Saw grass we had fired burned all night and continued to burn all the day. column of black smoke. On our way to camp Allen showed me the edible bud in the saw grass. Pulled the stalk apart and at the lower end where it breaks is an inch or two which can be eaten. Quite tender, not bad taste. Strands of saw grass running out to Glades among scrub cypress and small cypress heads. Great deal of cypress has died. The open glades are flags, lilies water grass and water. Bunches of myrtle bushes to west in rows from 10⁰ to 1500 ft long and 50 to 20⁰ feet wide, running nearly north and south. From distance appear to cover ground but from tree top seem to be isolated patches in open and can be passed around without any trouble. Look of all these cypress islands like low hills with short on outside and long inside. Spoken of as ridges.

April 4.

Chadwick and I ran a compass line from the Osceola camp to the bench mark at the edge of the Glades. McLeod and Ashley had camped there the night before. Brett and Funderhide had gone back to complete the line which they closed on Chadwick's bench mark about noon. No water by which we could take the boat any farther east, packed out all equip-

and abandoned boat. Fire destroyed Brett's pack.

The line across the Glades was begun on February 8th by Funderhide and Troutman, carried the line out as far as Wilkinson's store. Brown's store on small sand island half a mile out in the Glades. Wilkinson's east of Brown's half a mile, mile out in Glades. Brown's is said to be near the place locally known as the Boat Landing or Bow Legs Promontory is spoken of as the edge of the Glades. Consider edge of Glades for work.

From Feb 11 to 15 the Glades line was continued from Wilkinson's store by Brett, Funderhide and McLeod, returning on 15. When party returned to Glades Feb. 18 increased by Chadwick and Anderson as required all took three men to pull canoes. Another boat added. Required one day for this party to reach place where they had left off on the 15th. Remained in Glades until Feb. 27, having advanced line to 14.5 miles. Returned, reaching Brown's March 1. During this trip often required entire crew to pull boats over dry strands. Outfit started back in Glades on March 4 with same men with the addition of R.L. Allen, three days being required to reach the point where they left off on February 27th. When the line was advanced to 18.5 mi the water had nearly disappeared and a reconnaissance showed there was practically no water for 5 or 6 miles around. As it was impracticable to take the boats further four of men packed such supplies and camp outfit as they could carry in addition to their bedding while other two carried their own bedding and ran the line of levels. The line was then advanced to 30.5 mi. Supplies becoming very low all of outfit was left at this point except necessary bedding and last of subsistence and entire crew started on March 18 for the East Coast, arr. Pompano on the 20. The party which returned from the Glades to Ft. Lauderdale did not reach the point where they left on the 18th, till noon on the 30th. The line was then carried forward, two men being able to handle the canoes until April 3rd, when on account of shallow water, one boat was abandoned. Other canoe taken to point of closing the line at the eastern edge of the Glades. Abandoned.

Ontent fly was the only storm protection carried. Usually placed under the beds. On western side of Glades beds were made for the night by cutting and piling sawgrass on the drier strands. Ordinary Fla. mosquito bars over beds were sufficient protection against dew, mosquitos and snakes. Cooking done on a two-burner blue-flame oil stove. Did not prove satisfactory oil in opening prevented it from burning properly and oil bulky to carry. Worked when no wood.

Sufficient wood for cooking and places dry enough to sleep in eastern part of Glades. When saw grass was thick and interfered with running of lines, burned off, no cutting being required to clear the way.

Boats used were cypress canoes Indian. sharp at bow and square at stern, two ends somewhat higher than centre. One of boats which is about ave. size was 20 ft in length, 4 ft in front of the stern, the widest part being two feet behind the bow and gradually ~~taperingz~~ tapering back. Object of shape to prevent wedging in saw grass. Boats pushed by light cypress pole from 14 to 20 ft in length having small three corner piece of wood nailed to lower end, five by one inch. In good leads a man can pole 15 miles a day. One of Ft. L. boats made of sawed cypress. Boats very light, flat bottomed upset easily and when heavily loaded and settled in muck hard to start. Indian canoe preferred by all Glades hunters.

From Feb 8 to April 4 was occupied in running the line from Brown's to Pompano, the level line being advanced from one to two miles a day. The great difficulty was in keeping up supplies as the entire force was often required to pull the canoes over dry strands of saw grass several times, entire day spent in work.

From Brown's to the 16 mi. the walking very tiresome as one would sink in muck from ankle to knee. From 16th to 30th mi the walking comparatively easy, but from the 30th mile to eastern edge it was very difficult as there were many deep strands of water, there being floating bogs or tussocks throughout many places in this section, the worst being vicinity of 30th and 36th mi. These bogs are masses of vegetable

matter which are partially afloat. When one walks on them they break through. As one foot is pulled out the other continually sinks, making progress almost impossible and being extremely tiresome. The warm water often scalds the feet and the muck working around the shoe tops is the cause of sore ankles and a water grass known as wampee (waumpee) causes intense burning wherever water in which it grows strikes flesh for any length of time. This can be prevented by coating with some kind of grease, like axle grease or mutton tallow. Easier to travel barefooted if the feet can stand it. Can be pulled out of muck with less exertion and not so much danger of scalding or muck sores.

There is little real danger in the Everglades as the weather never becomes cold enough and if there is a gun or a small amount of fishing tackle and the edible bud of the saw grass there is little danger of starvation. - Been only one death in Everglades. ~~Man bitten by~~ Alligator hunter bitten by a cotton mouth moccasin drank a bottle of creosote as a remedy and it killed him.

There are sections where even at high water it would be very difficult to force a boat through the saw grass but then there can usually be found open places through which a boat can be run. During low water the work of walking and dragging the boats or carrying packs is so fatiguing that little headway can be made.

April 5th the Pompano elevations were connected to low tide at the mouth of Cypress Creek by Paul Funderhide. Outfit disbanded Ashley released, rest of crew to Ft. Myers.

Survey. At the beginning of the work the location of a bench mark in the vicinity of Ft. Myers was not known, consequently a bench mark was established and an initial elevation of 50 was assumed. With this initial elevation at Ft. Myers, P. Funderhide ran a line of levels eastward along the old military trail via Immokalee to the Mission and Brown's store. From same point ran line of levels along the main road via

Lawrence Pratt.)

Buckingham and Labelle to the Travers House, thence along the western edge of the Glades, tying on to Funderhide's line at the Mission 1.64 feet high. The two parties were then united and the line with Funderhide's elevation was cont. across the Glades from Brown's store to the eastern edge of the Glades.

Later in the season a bench mark was found at Ft. Myers which had been est. by the U.S. Corps of Engineers during the survey of the Caloosahatchee river. For the sake of uniformity it was thought best to use the same elevation of mean low water as had been used by the Engineers consequently this bench mark was connected to the initial bench mark est. by this dept. and all field elevations run from Ft. M to the eastern edge of the Glades are reduced to the army datum by subtracting 42.32 from each. The distance along these line of levels from Ft. M to Brown's store was obtained by pacing as there were no stadia rings in the instrument. From Brown's store eastward 22.5 mi the distance was obtained by stadia. (Bench mark and level from Ft. L. reached by subtracting 7.35 ft.

From info of the Coast and Geodetic Survey the max. range of tide and Punta Rassa at mouth of Caloosahatchee, is 3.6 ft, ~~max~~ ^{mean} range 1.7 ft and at Hillsboro Inlet which is near Pompano the max. range is 3.7 with a mean range of 2.3 ft.

Letter to

Richard Salinger esq.

Jax. Sept 10, 1867.

Mr. Grenshaw's notes and observations in ref to a survey from Ft. Thompson to Lake Hicpochee received. Then via margin of Everglades to a point se of Indian Boat Landing-- where Indians landin coming over from Miami. Grenshaw also connected levels with B.M. of Gen. Weigs at Ft. Thompson. Secured notes through courtesy of Capt Black (Wm. M. Black in charge US Survey and eng. work. Distances gone over by levels and meanders 70 mi.

First work est. level of Lake Hicpochee with the B.M. at Ft. Thompson. Capt. Black found Hicpochee below Okechobee. Col. Weigs found them same level.

Grenshaw-- gradual fall of 6 inches to the mile. Fall not nearly so rapid as on the line of canal leading west from Hicpochee to the Caloosa. Work on east coast should be done.

Fall of 12 ft ample for purpose.

(signed.) J.R.Kreamer.

Jacksonville, Fla.
February 4, 1884.

To Jas. M. Kreamer,

Chief Eng Okechobee Drainage Co.

Enclose field note on reconnaissance of South shore of Lake Oke.
ext from extreme s. end of Lake through centre of Everglades to the
head waters of the Harney River and thence down said river to the Gulf
of Mexico. This exp. was fitted out by the New Orleans Times-Democrat
and placed under command of Major A.P. Williams. Our party left Cedar Keys
on the 18th of October and proceeded to Lake Oke via Punta Rassa, the
Caloosahatche and your canal connecting Lake Micpocbee with Lake Oke.
We coasted along s. shore of Lake Oke in a se direction to the extreme
SE end at which point I determined the latitude by a meridian altitude of
the sun (using the artificial horizon furnished by you and a sextant of
my own) and found it to be ~~22° 28' 12" N~~ 26 degrees, 40', 30". I find in
this locality 8 streams or bayous making in a southerly direction and
extending from 1 to 2 miles through low wet swamp to saw grass, where they
cease. These are from 1 to 300 ft wide, 8 to 10 ft deep with soft mud bottom. The margin of lake generally is fringed with low
wet swamp and saw grass, swamp averaging from 1 to 2 miles in width before
reaching the sawgrass extending south of nearly 100 mi. In places I find the
banks of these bayous or streams elevated about the water from 1 to 2 ft
the soil of a rich dark color and exceedingly rich in quality. Taking
advantage of one of these lagoons to pass through the sugar apple and enter
the saw grass ocean in which we find but a few inches of water in which
to float our light boats, but flowing perceptibly in a southern direction,
I sounded regularly with a 10 ft rod and for 30 miles, our course being S
I find no evidences of rock or sand. No means of determining how much thicker
this muck. At that distance 30 mi s of lake I found rock at 8½ ft below
surface, at 35 mi rock 7½ ft below, at about 40 mi from 2 to 4 ft. The

Times-Democrat 2.

lake at this point reached the northern limit of the lower Everglades. and Gen. Childs' route as rep. of the map from Miami to Waxa "adjos landing. This routemay be considered the dividing line betw. the Upper and the Lower Glades. Theupper or northern body being a solid mass of saw grass ext. 30 mi. East and West and 40 mi. n and s. which has hitherto been considered impenetrable. The dividing line is not defined except by a complete change in the character of the sountry which cons. in numerous islands and sloughs. (course gen. southerly) By taking advatag of which you can make your way through thesaw grass. The lower Glades is also saw grass but cut up by sloughs and dotted with innumerable small islands, varying in area from 1 to 20acres Most of these islands are subject to overflow. Soil rich laom.

At a point about e from Bowlegs Landing Capt. "entry left us with a small boat and one man and proceeded to Ft. Myers, for the purpose of sending us assistance should it become necessary. "e informed me that the day after leaving us almost on dry land he found a current of water 2 ft deep flowing southerly along the cypress; that the current was sufficiently strong to bend the saw grass in the direction it was flowing and that the canal connecting Lake Hicpochee with Oke. did not, in his opinion, carry off one-tenth the quantity of water that was takenoff by this natural channel. It has been shown by the surveys of the USEng that there is a fall from Lake Oke to tide water of the Gulf of Mexico of 23 and 6/10ths ft. It has also been ascetained that there if a fall of about 22 ft from "ake Oke to Atlantic Ocean. One one expedition we had no level and hence ran no lines but so that it was impossible for us to determine the diff. of level between the Lake and the Gulf. As we approached the headwaters of Harney's river the rock crops out at the surface under 2 inches of water, except where we found sloughs heading toward the Gulf in a S di ection. We entered the head of Harney's river by one of these sloughs (10 inches of water in grass slough). This stream is navigable

Times- Democrat 3.

for about 18 mi for small boats and about 12 mi for vessels drawing 4 ft. The river is about 250 mi wide, with rock bottom. Water perfectly clear, banks low mangrove swamp. The district of rich land south of Lake Oke extends about 30 mi from east to west and about 70 to 75 miles from n to s embracing over 1,000,000 acres of land unsurpassed for fertility, and richness in quality which when reclaimed will be the most valuable sugar district in the US.

Respectfully,

Charles F. Hopkins, asst. eng.

Field notes (CFH.)

Nov 2. Sounded at entrance to canal at Oke and found depth of five ft. to soft mud and 4 ft through the mud to a hard formation of sand. "o rock total depth to land formation 9 ft to which depth the canal can be cut. Where there is sand bottom the canal will scour or deepen but little or no scouring is observed when there is mud. The canal between Oke and Hicpochee, the bottom being mud, has scoured little if any. I find the water about 1 ft above the natural bank of the canal. The current in canal where it leaves Okechobee is not over two knots an hour and scarcely perceptible where it leaves Hicpochee. This I attribute to its spreading in the saw grass and the rise in Lake Hic caused by heavy local rainfall. I find the water from Hic to Sugar Berry Hammock and a short distance below a depth of 2 ft over the natural bank of canal. The current from Hic to Ft. Thompson and downstream is unusually rapid, evidently caused by the rise of water in Hic. On the 27th of Oct the rise of water at Ft. Thompson was within the banks and just beginning to rise. The high water found at head of river and Lake Hic will evidently produce the usual overflow of the Caloos. and valley unless it is obviated by the work done by the drainage company at the fall, near Ft. Thompson where the great trouble exists. Hitherto it has been observed, taking the water at Sugar Berry Hammock and a short distance below 4 miles below

Times- Democrat and field notes--4.

It is noted that the water at Ft. Thompson was 8 ft above present height with a current scarcely perceptible for the entire distance of 10 or 12 feet in the air line. The escape of water through Caloosahatchee at and near Ft. T. not being of sufficient capacity to prevent the escape of the water; it is so obstructed or banked up at or near Ft. T that there is a back water or cessation of current above the falls. I am credibly informed that by observation in 1878 during the highest overflow ever known in this country it was proven that the waters of Lake Oke and Ft. Thompson were on the same level and even at the falls at Ft. T at that time, there was no perceptible current.

The first appearance of any current was several miles below Ft. T. I imagine this section of country from Lake Oke to Ft. T to be an immense funnel its small end being at or near Ft. Thompson. This funnel is capable of permitting an ordinary escape of water caused from local rainfall but during a wet season common in this region it becomes gorged and is insufficient to take off water and overflow of the Caloos valley ensues.

For navigable purposes the present river is sufficient. In order to prevent overflow I would make the following suggestions. Commence at present bank and remove earth 150 ft on each side of channel on level with present bank of river. This cutting would commence where the river forms a well defined channel, just above the late falls. There is a gradual rise on each side of canal. An el. of 2 ft in 150 or a fall of 2 ft in 150 toward canal.

Notes. On expedition two boats lost in high wind. Ten days in saw grass. Used bacon for fuel. no wood-- to boil coffee. Boats encircled by burning saw grass. deepest water in heaviest saw grass. First sign of animal life--birds. Seen alligators. five days water in gullies and saw grass abandoned provision boat. small island 14 days out first solid land. fock-bird rookery 40 miles Lake Oke. crossed Childs route. near head waters of Harney's river. Situation desperate. 4 days rations bread, boats high and dry on rocks. Wet man piloted to Shark r.

Times- Democrat field notes--5.

Mr. Atwell's place on Rogers creek. Lost man's key in schooner Capt Atwell.
Arr. following days at Collier's place on Big Marco island, 18 acres of
first quality land 20ft above sea and under cult in trop fruits and vegs
growing in profusion. Sailing from Marco reached Punta Rassa.

HOWARD BOND
MADE IN U.S.A.

Settlements on East Coast of Fla.

(From The Homeseeker, Dade Co. Fla.) 1907

Palm Beach.

Lantana-- vegetables, pineapples, orange and grapefruit. west shore of Lake Worth.

Hypoluxo-- foot of Lake Worth. Vegs. and fruits. Old places. Onions for years.

Boynton-- few years ago all this was wilderness until extension of FEC new thriving village. pineapples and citrus

Delray.-- since FEC pineapples. west of Delray everglades.

Yamato- Jap colony two years ago.

Boca Ratone-- several years large settlement. Ingraham groves

Deerfield and Pompano-- FEC towns

Colohatchee-- among newest

Ft. Lauderdale-- oldest settlements in Dade. Ft in 1832 in Indian war. two years ago river dredged-- grown up with FEC

Dania--FEC

Hallendale--FEC

Ojus-- FEC

Fulford-- west of F. people had homesteaded before FEC

Arch Creek- Capt. J.H. Welch, planted first grapefruit grove. Mr. Fred C. Miller of Elmira citrus groves and dev.

Biscayne-- development in back country

Little River-- valley of the Little river whose source is the Evs. Often overflowed. West-- Humbugus prairie. First groves planted now in bearing (7 yrs ago ?)

Lemon City-- village long before rr. People from Key West homesteads-- xxx tropic fruit carried to Key West sailing vessels. Many old plantations bought by northern people.

Buena Vista- a Mr. Bliss owned largest budded avocado grove in world. west--Allapattah flats.

Homeseeker--2.

Papers in Miami 1907---The Daily and Weekly Metropolis, the Miami Evening Record, the Florida Record (weekly) The Miami Morning News and Weekly News and The Florida East Coast Homeseeker.

Cocoanut Grove.

Larkins--

Cutler-- located on Ferrine grant village built on high bluff overlooking Biscayne bay-- soldiers and ragged keys can be seen. One hotel, the Richmond cottage (Dr. S.H. Richmond.) 120 acres planted veg and groves Last village to south located on bay front.

Black Point, Naranja, Homestead, Key Largo.

(Mr. Harry L. Brown, the East Coast Homeseeker, St. Aug.

HOWARD BOND
MADE IN U.S.A.