

Railway Location in the Florida Everglades

By William J. Krome

With an introduction by Jean C. Taylor*

INTRODUCTION

When William Julius Krome was six or seven years old his father took him to St. Louis to hear and later to meet the great African explorer Stanley. Young Krome was so impressed that for years he cherished the idea of becoming an explorer and collected books on African exploration. Krome never explored Africa but in 1902-03 he made a rather remarkable exploration of the wilds of South Florida.

Krome's grandfather, Charles William Krome, was born in Hanover, Germany, and was a law student at the time he was inducted into the German army for the required year of service. Before the year was up Bismarck extended the required service to two years and Krome stowed away to America rather than serve a second year. He then joined a wagon train going over the mountains and down the Ohio River to Louisville. The pioneer community had no need for a young lawyer but did need a cobbler, a trade which Krome had learned during his army service. He solicited orders for shoes, bought the supplies, and engaged less enterprising German cobblers to make them for him. He was soon a prosperous businessman. His son, William Henry Krome, moved to Edwardsville, Illinois, where he became a judge, and where *his* son, William Julius, was born February 14, 1876, the only boy in a family of seven children. William Julius had a classical education at Northwestern and DePauw, then studied engineering at Cornell but left in his senior year to do a survey for a railroad in Missouri. He never returned to school because he was not one to worry about degrees or signs of achievement. He went on to other

*Jean C. Taylor is a frequent contributor to *Update*.

railroad jobs in South Carolina and Georgia and in 1899 came to Florida to work for the Atlantic, Valdosta and Western Railway Company.

In 1901 Krome found himself between jobs. He spent the winter in Jacksonville, and enjoyed exploring the St. Johns River in a small boat, fascinated with a country so sparsely populated. When he learned that the Florida East Coast Railway Company was planning to extend its railroad to Key West and needed someone to survey possible routes he applied for the job and was hired. Early in 1902 he made a trip down the east coast as far as Cutler recording all points of interest with his camera. He loved photography and recorded the progress of his work projects as well as the activities of his family and friends.

When Krome arrived in South Florida the Florida East Coast was in the process of building a railroad between Miami and Homestead and Krome first worked on that project. There were two possible routes for the Key West Extension. The first was to the east and along the keys the other overland to Cape Sable and across shallow Florida Bay. Krome headed a crew to survey the latter route to see if it were feasible. In preparation for this survey he studied the notes of a United States surveyor named Jackson who had surveyed South Florida in 1848. Jackson has summarized his



Reproduced from the Krome family collection.

Krome, left, and Anderson after a hunt. Wild game provided meat for the expedition.

notes by saying, "The country south of Miami is rocky pine land intersected with marshy areas they call glades. It has no agricultural use. The Indians use it for hunting deer and it is sometimes referred to as the Indian Hunting Grounds. No one lives there. The rocky nature of the soil makes it unsuitable for agriculture but even if it could be farmed the great storms that sweep over the southern end of the peninsula in the fall would make farming impossible."

From December 1902 until June 1903 Krome surveyed from his permanent camp south of Homestead (in the Royal Palm Park area) to Cape Sable and around by boat to Card Sound. He found Jackson's stakes and blazes so accurate that he gained great respect for his predecessor and named his permanent camp Camp Jackson. As a result of his six-month survey it was determined that the route along the keys was the better one. The next winter with many of the same crew Krome surveyed that route as far as Jewfish Creek.

Krome wrote a report of his Cape Sable survey entitled "Railway Location in the Florida Everglades" which was printed in two issues of the *Engineering Record*, April 2 and 9, 1904, and reveals his careful planning and meticulous attention to details. Later he was to become chief engineer of the Key West Extension and successfully completed it. South Florida had won his heart; he settled here permanently, married Isabel Burns and remained in Homestead until his death in 1929. In his honor an important artery is named Krome Avenue.

JEAN C. TAYLOR

RAILWAY LOCATION IN THE FLORIDA EVERGLADES

That portion of the State of Florida lying south of latitude 25 degrees, 30 minutes has, up to very recent times, remained as completely unexplored as the interior of Thibet. It embraces the southern end of the Biscayne pine reef, the lower part of the Everglades, Whitewater Bay and the Great Mangrove Swamp.

A few squatters have for some years raised vegetables for the Key West market on the prairies in the vicinity of Cape Sable, but their knowledge of the country to the north of them has been very limited. The few existing maps were entirely unreliable and the reports as to the character of the country by the occasional trapper or inquisitive naturalist who had penetrated for some distance into the region, were far from encouraging.

Therefore when the officials of the Florida East Coast Railway decided upon an exploratory survey through this territory, with the object of determining its possibilities from a commercial view point, various problems rather out of the ordinary were presented to the engineering department. To obtain the information desired it was necessary to cover a belt of too great width to confine the work to a single center line so a series of closed meanders, linked together into a continuous chain, was adopted as the trunk of the survey. From this, laterals and tie lines could be run as required. The fact that one end of the work was at a known elevation of about 12 feet above mean low tide in Biscayne Bay, the other at Cape Sable on the Gulf of Mexico, with a great probability that at no place between would the elevation of the country vary more than a few feet from a regular grade line connecting these two points, made a line of levels unnecessary.

The question of obtaining supplies being one of the most difficult to solve, as small a field party as possible was organized, and the stadia adopted as the method of measurement.

There is never any trouble in finding plenty of applicants for every position open on a piece of exploratory work of this character, but the selection of men who will go the whole route and who can be brought to understand, before-hand, that it is hard work, under trying circumstances, and not a pleasure trip that they are going into, is one of the serious problems for the chief of party. For this expedition, men of previous experience on similar work and of known staying ability were of course given the preference and green material cut out to as great an extent as possible. The choice of good men for the places of axemen and packers was particularly difficult, for upon them depended much of the work and colored labor had been decided upon for these positions. The writer has found the Central Georgia negro about the most reliable of his race for rough work and seven of the eight colored men selected were from that section. The following half year, in which these men worked on the average 28 days a month, without a single desertion or complaint, justified this belief.

The party when complete numbered sixteen men. Of these, eight were in the field crew, including chief of party, transitman, recorder, two roadmen, two axemen and a colored cook. To keep them supplied with food and necessaries required a pack party of six men in the charge of a white chief packer. A steward looked after the permanent supply-camp and was required to keep track of the stock on hand, closely reporting weekly to the chief of party. Owing to the irregularity of communication



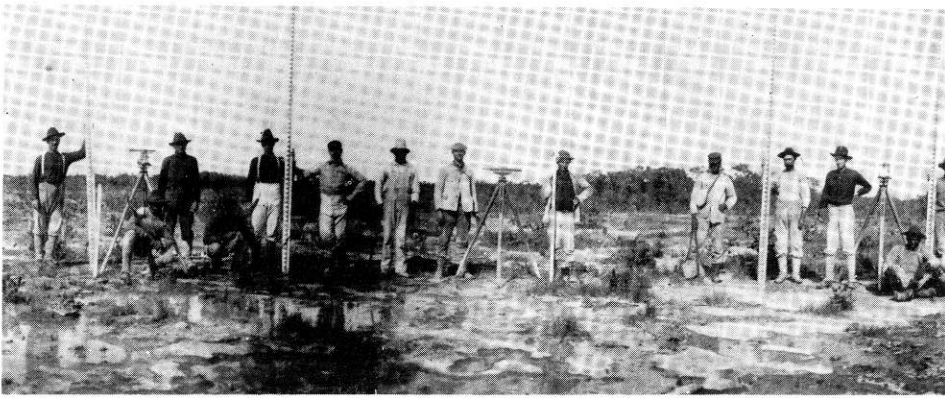
Reproduced from the Krome family collection.

Georgia-born packers and axemen of the expedition enjoying Christmas dinner, 1902. Head axeman John Henry, second from right.

with the nearest source of supplies at Miami, it was necessary to get in orders a considerable time before the goods were actually needed.

Each member of the field party was furnished with a stout canvas knapsack and the limit on personal outfit was the weight the individual felt able to carry. This amount was reduced in most cases very shortly after the first long pack, but probably averaged forty pounds per man during most of the trip.

Various materials were tried for field clothing with more or less success. Pantasote sheeting was found too warm for the climate and gave poor service. Canvas wore well and dried quickly after being wet, but is too stiff and uncomfortable to make a desirable working garment. A good grade of khaki, well made, was found to give the best satisfaction of any fabric tried and has been used with success on subsequent work. It wears well, dries quickly and is soft and easy fitting. Foot-gear caused much trouble. Rubber is a poor material for the purpose under any conditions and in a warm climate, for regular wear, will not do at all. The best of leather when soaked in water for hours and then pounded over coral reef, indescribably rough and sharp, soon shows signs of grief. Ordinary shoes



Reproduced from the Krome family collection.

Krome's photo of the fifteen members of the surveying party with instruments.

do well to last a single week. A half-boot, lacing to the top through large eyelets (hooks are a nuisance), Bluchor cut with bellows tongue, a heavy sole and stiff counter came nearer meeting the requirements than any other type. The soles were kept thickly studded with hob-nails and the uppers were pierced, well down, to let the water out. To keep it out when wading waist deep was an impossibility.

The mosquito plague being one of the most serious obstacles that was encountered, each man was provided with a bar and the proper stretching of these became quite an art. About the best bar for this purpose is made of cheesecloth with a canvas roof. The canvas top should be seven feet long by three feet wide, with loops or grommets at the corners. The cheesecloth should have a depth of about five feet and be sewed to the under side of the roof, leaving two inches of the canvas projecting all around. If this projection is stiffened with buckram or by doubling, and the roof of the bar stretched flat when pitched, it will shed a light rain quite well and the water will not run down the sides. These nets may be stretched from a stake at each corner, or by putting in a spreader across the ends, two stakes will answer.

Head nets are uncomfortable affairs at best, but their use on this work was at times imperative. Cheesecloth and bobbinet are too hot and are very hard to see through. The net that was most satisfactory was that worn by the Cape Sable squatters. It is built for use over a stiff rimmed hat and consists of a band of 10-ounce canvas, fitting closely around the crown of the hat and extending out to the edge of the rim. To this is firmly sewed a strip of close mesh copper wire netting extending down about 3 inches in the back and curving over the shoulders to the level of the wearer's chin.

Cheesecloth is taped on around the bottom of the copper gauze of sufficient width to tuck well inside the coat which is buttoned over it. The wire netting is kept out from the face by the stiff brim of the hat, allows the air to pass through freely and can be seen through with ease, it being possible to run an instrument quite well from inside one of these gilded cages. When not in use it can be completely removed from the hat and there are no strings to become knotted or broken loose. It is, however, somewhat troublesome to carry.

A wagon trail was broken out from the claim of the last homesteader, through the rock reef forming the Biscayne pine land, to a point near its southern extremity and there a base of supplies was located. To this point goods could be hauled in light loads by wagon, but beyond it everything was advanced to the field party by the packers, until the Whitewater Bay region was entered when connection was made with a relief schooner.

To as great an extent as possible, all provisions were put up in duck bags waterproofed with parafine. These bags were of two sizes, holding about five and ten pounds apiece of such provisions as rice, beans or meal. They, in turn, were placed in specially waterproofed canvas pack-sacks and their contents seldom showed signs of dampness even after long exposure to the weather. Regular leather pack harness was used in handling the loads. The weight that could be carried by a packer varied of course with the length of the journey and with the character of the country to be traversed. Under favorable circumstances packs as heavy as ninety pounds were brought in over a trail five miles long; at other times, through pot-holes and deep muck, twenty-five pounds was a wearying load. A 14x16 foot wall tent, without fly, makes about as heavy a pack as should be put on a man under the best of circumstances.

Boats were a necessity in transporting supplies, although the water in the southern portion of the Everglades is usually very shallow during the dry season of the year, during which the work was carried on. The dug-out of the Seminole Indian is too heavy for carrying, and canvas or Canadian canoes are too frail to stand dragging when loaded. So 14-foot steel duck boats were used and served the purpose admirably. They were light enough to be readily carried by two men across portages, and three men could drag one loaded, where only a few inches of water covered the muck. By using a couple of these boats as sleds, with two men harnessed in front and one pushing with a pole from behind, the six packers could bring in twelve full-size packs through muck and water where 40 pounds would have been a killing back load.

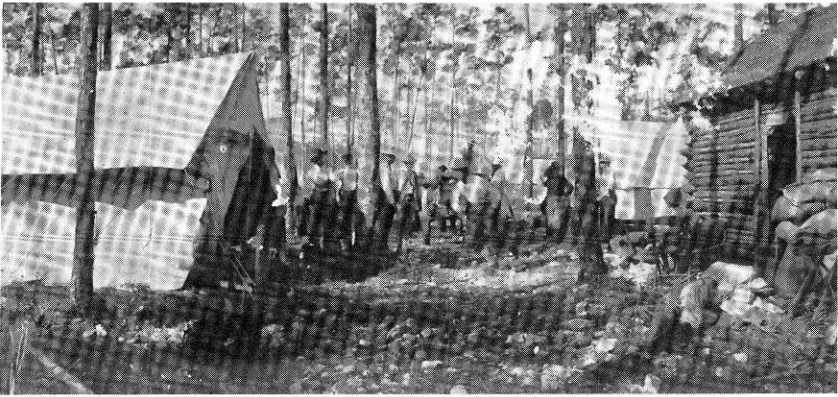
The food was confined mainly to such articles as could be sacked. Under this head come rice, grits, several varieties of beans, oatmeal,

coffee, sugar, salt, flour, meal, tapioca and evaporated fruits. Tinned meats, evaporated cream, baking powder and other canned-goods were used to some extent but they make an awkward pack and were dispensed with as far as possible. Pilot bread saved the use of an oven and was our staff of life. Fresh meat in the form of venison was easily obtained during the major portion of the trip but fresh vegetables were unknown on the menu.

An emergency supply of condensed foods was carried and on several occasions was drawn on heavily. This class of goods is largely imported from Germany and can be obtained in considerable variety. Soups of a dozen kinds, all tasting alike, are put up in vest pocket packages, vegetables, of as many sorts, evaporated and compressed until they resemble a good grade of plug tobacco, sliced potatoes as hard as bone, porridge, sausages and evaporated eggs were all given a trial. The potatoes, after being well soaked, are an excellent substitute for the fresh article and the soups properly prepared, are nourishing and palatable, but it requires a hungry man to relish the vegetables or eggs.

The field party traveled as light as possible. Tents were abandoned after leaving the pineland and a couple of flies used to protect the goods and as a shelter in heavy rains. All cooking utensils were of aluminum and a complete outfit for eight men nested in one pot, and weighed barely 15 pounds, entire. A tin box, such as is used for fishing tackle, and containing a supply of needles, thread, copper wire, awls, beeswax, scissors, screw driver, pliers, copper rivets and various odds and ends was in great demand and took the place, to a considerable extent, of the usual camp chest. A similar box held drafting materials, and a steel straight edge, an 18-inch rolling parallel rule, and a small drafting board completed the necessarily meagre office outfit.

Medicines were carried in what is known as a country doctor's buggy-case. Made of heavy sole leather, with a compartment for surgical instruments and bandages, and fitted with a good number of bottles of various sizes, it answered the purpose well. Such a case is of much the same size and shape as the ordinary 4 x 5-inch camera and slung over the shoulder does not add greatly to a pack load. The stock of medicines was selected to meet the needs of the climate and could be replenished from a supply at the permanent camp. A surgical kit containing several lancets, scissors, forceps and flesh needles and a twist or two of silk was ample for our needs and came into use several times. Small pocket cases, each holding an hypodermic syringe and two small phials, one filled with a 10 per cent solution of permanganate of potash and the other with 1/50th



Reproduced from the Krome family collection.

Camp Jackson.

grain tablets of strychnine, as an antidote for snake bites, were distributed amongst the party so that one would always be at hand if needed.

The climate was healthful, for the water in the Everglades is pure and fresh, and malaria is an unknown quantity. So by keeping watch of the men pretty carefully and meeting ailments before they had made much progress, the party was kept in splendid trim during the entire six months and no time was lost through having a big sick roll.

Sleeping bags of light felt with a waterproof canvas cover were used by most of the men and were very satisfactory. As no cots were carried, and boughs fit for bedding were seldom obtainable, the usual mattress was a pile of sawgrass. Dry camping places were the exception and as the mosquito bars were often pitched in the open, the canvas covers of the sleeping bags were a double protection from rainfall and from the wet ground. Rolled up with the mosquito bar inside, they were carried on the owner's pack when on the move.

The machete was used for clearing line, opening up camp sites in the jungle, cutting sawgrass and for every purpose for which the axe and brush hook are usually needed, except the felling of large timber and the driving of stakes. It is strange that this useful implement has not come into more general use on preliminary and location surveys. It is far superior to a brush hook, as it can be handled much more easily, has no helve to break, and as far as my experience goes is of a great deal better metal. Axe men are prone to lose brush hooks by misplacing them while using the regular axe, but the machete may be carried in a sheath hung to the belt without hindering the movements and need never be laid down while in the field.

The stadia was particularly adapted for this piece of work. It allowed

a small party to do the work thoroughly and took the place of the chain or tape where the use of the latter in some cases would have been impossible: There are stretches miles in length through the Everglades where stakewood of any kind cannot be obtained and where even the hubs necessary for the stadia work had to be carried long distances. This would have seriously handicapped regular stationing and ordinary marking pins would have been useless on account of the depth of water and soft muck. When the Whitewater Bay region was reached, numerous streams, islands and stretches of coast were meandered where the dense mangrove swamp extended out into the water for fifty feet or more beyond the shore line. As a mangrove swamp is about as hard to cut through as a solid wall, a chain survey would have had tough work making half a mile a day. By zig-zagging the streams and cutting from one projecting point to another along the coast, the stadia party, operating from the boats, made $3\frac{1}{2}$ to 4 miles per day, regularly. Special 12-foot rods, built as light as possible, were designed and canvas covers furnished to protect them when not in use. A steep tape was kept in camp and when the chance offered a few of the longer sights were tested by careful measurement as a check on the adjustment of the wires.

One radical departure from usual methods, which will probably shock stadia theorists, was made early in the survey. The country was so level that after the first few miles the reading of the vertical angle was abandoned entirely. This simplified instrument work somewhat and reduced to a minimum the labor of computing the length of sights. It certainly did not seriously impair the accuracy of the results for a carefully chained location which has since been run through a considerable portion of the territory, checked out with the exploratory line remarkably well.

Good instrument points were, as a rule, hard to get, and it was no uncommon occurrence for the tripod head to be at the water level with a footing of soft muck that increased the probable error in angular measurements alarmingly.

A computed bearing was carried throughout and any sudden deviation from the needle would quickly point out any mistake or large error in taking the angle. Sights of from 600 to 800 feet were about the usual length. When meandering streams the average would be shorter, while in work along the coast, where the failure to secure some projecting point might mean a half day's heavy chopping around the shore of a cove, sights of over 2,000 feet were occasionally made and the readings taken in halves.

The closed traverses, after being balanced, were platted from the same system of co-ordinates, and the tie lines and laterals were built up on

this trunk. The field map drawn on heavy canvas-backed paper, was platted to a scale of 1 inch to 5,000 feet. As the outline of the whole southern end of the State had been previously put on from the government coast survey charts, the position of the party could be learned at any time and the work ahead blocked out.

Continual scouting ahead was necessary and in these trips seldom more than two men took part, enabling the field party to continue their work without interruption. As such expeditions often lasted several days, each man carried a light pack containing sleeping bag and mosquito bar, one or two small aluminum cooking utensils and a limited supply of provisions. A leather haversack held flag cloth, a ball of strong cord, note book and a pocket compass with folding sights. A pair of Tiedor binoculars, machete, rifle and belt of cartridges completed a load that by nightfall seemed to its bearers only fit for a two-horse team. A start was always made from some point on the stadia meander and a careful record of courses and approximate distances kept. When the new territory had been penetrated for some distance trees were climbed at intervals of about a mile and observations made in every direction from them. The lack of a pair of light steel climbing irons, such as are used by ornithologists, was keenly felt, but this need had not been foreseen when the outfit was gotten together. As the trees used were often lone pines on some isolated rock reef it was no mean task to "shin up" them. The observer carried the ball of cord with him and could then haul up the pocket compass, field glasses and note book. Bearings would be taken on as many known points behind as could be observed and then the character of the country ahead in several



Reproduced from the Krome family collection.

Steel duck boats being used as sleds in shallow water, two men were harnessed in front, one pushed from behind.

directions noted. Before descending, a flag fastened to a sapling was hoisted and securely lashed in the top of the tree. The tree was then marked with the blaze of the survey, a long chop with a hack above and below. If the territory developed by this system of scouting proved to be important, it was more fully investigated by a stadia line; if not, it could be platted up with sufficient accuracy for the purpose in view from the notes already obtained.

The party was in the field from the first of December, 1902, until the early part of June, 1903. Trail building and the establishment of a base of supplies held back the work for a month and in the remaining five about 300 miles of stadia line was run besides accomplishing considerable work in channel sounding. The exploration was under the general direction of Mr. E. Ben Carter, chief engineer of the Florida East Coast Railway.

The most serious obstacles encountered were the heavy muck and dense saw grass of the Everglades, and the jungles and mosquitos of the Whitewater Bay region. The muck with proper drainage will eventually become fine farming land and the mosquitos will disappear to a great extent as the country opens up. The malaria breeding species of this insect is evidently not present, for that disease was conspicuous in the party by its absence.

As a result of the expedition the lower extremity of the Biscayne pine land was defined, Long Key, a pine island of some 18,000 acres, lying in the Everglades, the very existence of which was previously doubted, was thoroughly mapped. Whitewater Bay was reduced to one-half the size shown on former maps and two-thirds of the area known as the Great Mangrove Swamp was discovered to be open prairie.