# WESTWARD GO YOUNG MAN

## REMINISCENCES OF LES CHARLES

RETIRED CHIEF ENGINEER WESTERN REGION
CONSULTANT CANADIAN NATIONAL RAILWAYS;
MAJOR ROYAL CANADIAN ENGINEERS

VOLUME 2

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WINNIPEG–MANITOBA

# PART II

(1939-1975)

1. MILITARY SERVICE II

King George VI and his gracious Queen Elizabeth visited Canada, from Coast to Coast, during the early summer of that fateful year... 1939. Members of the Legion were on duty as their Majesties passed along Main Street, Winnipeg. Some of us discussed the current talk of the possibility of war, but little realized that in about three months the lives of many would be upheaved.[1]

Twenty years had elapsed from the ending of the 'war to end all wars' -- a period Sir Winston Churchill described in his volume, "The Gathering Storm" with the theme of "How the English-speaking peoples through their unwisdom, carelessness and good nature allowed the wicked to rearm." Italians, mesmerized by Mussolini, massacred helpless Abyssinia in 1935 and took over Albania in 1939. And Germans, under the spell of Hitler that they constituted a master race, prepared their strategic position by marching into Rhineland, 1936; Sudetenland and Austria, 1938; and Bohemia and Moravia, 1939.

Tensions increased as these two demoniacal leaders, intoxicated by successes, planned to dominate Europe and perhaps the world. Hitler furthered his position by diplomacy with the Soviet Union to sign a mutual Non-Aggression Pact with Germany, 22 August. War was inevitable. September 1st Hitler unleashed his dogs on Poland; to be challenged immediately -- Sunday, 3rd September -- by Britain and France in fulfilment of their treaty obligations to the gallant, but pitifully armed Poles, whose valiant cavalry charged the latest in armoured might. Sir Winston has narrated in his forcible language the devastation and utter cruelty that followed.

The last week of August, I was at Winnipeg en route from Steep Rock Iron Mines, Atikokan, to resume duties on the Hudson Bay Railway at The Pas. Lt. Col. J. H. Edgar, Commanding the 10th District Engineers, advised me that he expected Canada's forces would soon be mobilized on a war footing and he said, "If so, I would like you to recruit and command a Royal Canadian Engineer Company to be engaged in railway engineering." Although I fully realized the effect this would have on the life of my family, I accepted without hesitation. Prospects of far off fields, excitement and pride in taking part, even though a very minor one, have always had a magnetic effect on me.

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[1] Following demobilization, spring 1919, I retained status on the Reserve of Officers, 90th Royal Winnipeg Rifles -- "Little Black Devils".

However, I now concede to having a selfish tendency of character, to live my way and to act without enough consideration for the effect it might have on my family. Previously, I could justify myself by reasoning, "Man must provide the bacon," but now, there was no such convenient excuse. I was 46 years of age and had stable employment where Lena could be with me; whereas, if war was to come, as it did within a few days, she would be alone -- Eira would be in Victoria training to become a medical technician and John, true to his ancestry, would volunteer to serve in the Armed Forces.

I saw Helena off to visit her sister, Mrs. Carrie Cameron, at Grand Marais, before she would join me at The Pas; and then I boarded the C.N.R. for the North... Friday, 1st of September. The atmosphere was electric. At each stop the agent was pressed for the latest news.

Arrival time at The Pas was 07:25k. I went to the Opasquia Hotel for breakfast and then to the H.B.R. office. It was not long before a long distance telephone call came for me from H.Q. Military District No. 10, advising that I should report as quickly as possible. I explained that the next train from The Pas would arrive at Winnipeg on Tuesday morning, so it was suggested that I fly, but then there was no air service. Highway No. 10, under construction, however, was just passable.

Conrad Gran, office engineer, had recently purchased an automobile and he offered to drive me, so I was able to say that I would report at 14:00k the next day. It was then necessary for me to clear the situation with Major MacLachlan. There was no time for me to go to Atikameg Lake before leaving, so I had to ask Conrad to take care of my belongings there.

After packing what things I had at The Pas, Conrad and I had an early supper. We bid "au revoir" and sped away, without thought that it would be twelve years before I would have occasion to revisit the friendly North. A thunderstorm struck to cause the newly graded road to be very slippery. Travelling at a fast clip, the car skidded and turned completely around but, fortunately, did not run off the roadbed. Conrad straightened about to proceed more cautiously for a few miles, but soon the speedometer again showed sixty. After a stop for breakfast at Dauphin, we arrived in the forenoon at Winnipeg.

It was Sunday. Nevertheless, I phoned Mr. H. A. Dixon, Chief

Engineer, to request leave of absence from the C.N., for whatever period I might serve in the Army. The Chief invited me to have lunch with him at his home to discuss the matter. He was a keen judge of human nature, so granted me leave. Mrs. Dixon and son, Howard, were there too. In after years, Mr. Dixon said to me, "I could see you had your mind made up, so there would be no use in trying to dissuade you." This was just one of the many generous acts of kindness I received from Mr. Dixon -- a truly great gentleman and engineer.

At Fort Osborne, the H.Q. staff of Military District No. 10 was vitalized with the news of the declaration of war by Britain and France against Germany. All were full of vigour, preparing for mobilization of Canada's Forces on this memorable Sunday, September 3rd, 1939. At 1400 hours I was shown into the G.O.C., Brigadier Browne, to be interviewed. It was brief and to the point. He said that providing I passed medical category A1, I would be taken on strength immediately to command No. 1 Railway Engineering Company, Royal Canadian Engineers, with rank of major, and he added that he was of the opinion this unit would be amongst the first to depart for Overseas. All formalities were complied with; for the second time I was sworn in for active service.[2]

Then I placed a telephone call to Helena at Grand Marais. Her first words were, "Where are you? I thought you left for The Pas." To which I replied, "Yes, but I am now at Fort Osborne... you realize why!"

I did not anticipate recrimination, nevertheless it was a relief to hear, "OK, I will take the 'moonlight' into Winnipeg." We met on arrival of the train and walked over to the Fort Garry Hotel. It was wonderful to be married to Helena, so understanding; events had moved so swiftly and would affect our future and that of many others drastically. I have thought of this time and again and, as the years advance, I appreciate more and more how fortunate it was for me to have met Helena Violet Hamilton at Winnipeg, one winter evening of 1915.

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[2]The same rank as I had been discharged with in 1919, rate $7.75 per day; somewhat less than what I was earning with the C.N.R.

Military Service II

Next morning the pace continued to be rapid. I was issued the basic arms, 250 rifles, for the unit and proceeded with arrangements to recruit personnel. At dinner that evening Helena informed me that she too had been busy, having rented a furnished suite in the Colony Apts., overlooking Memorial Bouvelard.

Soon a cloud appeared to cast a shadow over the activities of M.D. 10. Prime Minister Mackenzie King hesitated at the brink of war. A week elapsed before Canada followed Britain and France in declaring war against Germany; and the plan for general mobilization which had been brought forth so eagerly from the official safe at Fort Osborne, was restricted by deferment of recruiting of several units up to their respective establishments. Mine was amongst them. This was indeed disappointing.

However, armed guards were detailed to protect all-important railway bridges, tunnels and other structures against possible sabotage. One very vulnerable point was where the main lines of the Canadian Pacific and the Canadian National cross the Fraser River, at Cisco, one directly above the other where the river, railways and highway are confined within the narrow valley. One well-placed demolition charge could have effectively cut the all-important rail transportation through the mountains to Vancouver for many months.

Mobilization and Railway Transportation

Canada officially declared war on the 10th of September, 1939. Logistics, particularly railway transportation from the West, through Central Canada, to the Atlantic Seaboard -- so essential to our immediate effort -- had to contend with two serious handicaps. The Canadian Pacific main route between Montreal and the ports of St. John and Halifax ran through the northern part of the State of Maine, foreign neutral territory, so passage of troops and relative war-time traffic was prohibited during the first two years of conflict, until the United States declared war on Japan and Germany. Consequently, this exceptionally heavy tonnage had to be funnelled through one line, the Canadian National, to Halifax. This presented a strain on its capacity to carry the traffic essential to the movement of Canada's forces to the United Kingdom.

The weakest link in the chain was the operating division between Moncton and Truro, with a heavy rate of controlling gradient, 1.60 per cent.

To overcome this critical situation, it was decided that a study should be made to investigate the feasibility of constructing an alternate line. I was instructed to undertake a reconnaissance survey and submit a report with all haste; so I departed for Moncton.

Although secrecy was advisable and I would be working alone, it was necessary to confide in the railway's district engineer to obtain basic criteria about the area. I arrived on a Sunday afternoon and Mr. Gunn met me and suggested that as it was too early to go to the hotel for dinner, he would take me for a drive. This included a visit to the natural local phenomenon, the "Magnetic Hill". Mr. Gunn stopped at the prescribed point, cut off the engine and released the brakes, to watch the car apparently run uphill, and he turned to me saying, "What do you make of that?" My reply was, "An optical illusion!" My new Eastern friend was a little disappointed not to confuse a Westerner. Nevertheless, he gave me many acts of kindness during my stay in his territory.[3]

My first move was to rent a U-drive and make a general appreciation of the countryside and to view the controlling factors. It was autumn, with all the gloriously-coloured foliage of that season, particularly in the beautiful Wentworth Valley.

Initial study indicated that the only practical route to reduce the rate of gradient to 0.60 per cent, and thus increase the tonnage rating, would be north-easterly from Moncton to the south shore of Northumberland Strait, facing Prince Edward Island, thence south-easterly to Tatamagouche and southerly, east of Nuttby Mountain, to gain the Salmon River Valley into Truro. This would involve construction of several major bridges to cross waterways flowing into the Strait and increase the operating distance between the two divisional points; also, one or more years would be required for construction. These factors appear to be the reason Sir Sanford Fleming located the existing line, originally the Inter-Colonial Railway, more directly, notwithstanding the heavy rate of ruling gradient.

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[3]Major Gunn was a battery commander in the Siege Artillery, World War I. A giant of a man, he was anchor-man of the Canadian tug-of-war team which pulled all comers, including the U.S.A. team, at the Inter-Allied Games.

It was a very interesting and enjoyable exercise. In addition to driving through the territory, I covered most of the route on foot. Some of my overnight stops were at hospitable small hostels to be found at such old-time communities as Tignish, Pugwash and Tatamagouche; it was amusing how curious my hosts were about what a lone stranger might be doing, but I do not think any of them surmised the reason.

One of Murray Hill's sisters was married to Mr. Wiley Baird, Superintendent of the Federal Agricultural Experimental Farm near Amherst -- a lovely home in beautiful surroundings. They received me very cordially and were pleased to have first-hand news of Murray. Another day, passing through Northport, I noticed the name of "Brownell" on a mail box by the entrance gate of a stately old farm-home. So I called in and enquired if the occupants were relatives of Frank and Marie Brownell of Winnipeg, through whom I had met Helena. I was informed they were and had a delightful visit at the Brownell's ancestral homestead.

A week before I finished the field survey, the first of the many troop trains passed through Truro en route for Halifax and Overseas. It was a deeply moving sight; fate decreed that I was not with them. Brigadier Browne's opinion, voiced to me when I reported to him at Fort Osborne, had not materialized.

After study of my report, it was agreed that construction of an alternative railway between Moncton and Truro could not be put into operation within the restrictive time for it to be of value to relieve the 'bottleneck' of traffic between these stations. Therefore it was decided to immediately install Centralized Traffic Control, with long passing tracks, automatic signalling with power switches, to partly alleviate the restrictive carrying capacity of the railway on this division. I was able to return to Winnipeg just in time to enjoy Christmas with my wife and children.

## 10th District Engineers

For a period of six years following the return of troops from World War I, there were no Non-Permanent Militia Engineer units in Military District No. 10. On 3rd October 1925 a graduate of McGill University in mechanical engineering and a former Infantry Officer, J. H. Edgar, who had suffered amputation of his left leg

during the battle of the Somme in 1916, was authorized to organize and command the 12th Field Company R.C.E. with the rank of major and headquarters at Minto Armory, Winnipeg.

It was a slow uphill task, but Major Edgar devoted most of his time, apart from his regular employment with the Canadian National Railways, to the formation of the 12th Fd. Coy. First he succeeded in interesting several recent graduates in engineering from the University of Manitoba to take officer training towards being commissioned with the rank of lieutenant, also suitable technicians and tradesmen to train to become non-commissioned officers; then, with the combined efforts of all, the required sappers were recruited to train in the evenings at Minto and annual summer camps.

The need for expanding the Engineers was recognized and the 10th District Engineers came into being on 5th February 1938 with Lt. Col. J. H. Edgar in command. Capt. E. J. W. Akins was promoted to major to command the 12th Fd. Coy. Shortly after authorization came through for organization of the 7th Army Troop Company under command of Capt. W. A. Capelle, subsequently promoted to major. Both these N.P.A.M. companies were called out for active service upon mobilization September 1939 and sailed for England early in the New Year; the 12th Fd. Coy. arrived at Aldershot on 10th February 1940.[4]

The fact that this was possible was due to the determination of Jack Edgar to prepare engineers for service in the event of war; great credit is due to him, although handicapped by the loss of one leg. Colonel Edgar's service was not appropriately recognized by award of a decoration; he was a truly dedicated 'officer and gentleman'.

After the pre-war N.P.A.M. Engineer Companies became Active Service formations, the N.P.A.M. was again recruited up to strength as part of the Canadian Reserve Army to support the active Force overseas. Lt. Col. Edgar continued in command of the 10th District Engineers

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[4] E.W.J. Akins was progressively promoted to become Colonel, Deputy Director of Engineering Services at Ottawa, in 1942 and W. A. Capelle took command of No. 2 Bn. R.C.E. with rank of Lt. Col. in 1943; during his undergraduate years, Bill was a rodman on CN construction.

(Reserve) with his characteristic zeal and he was authorized to appoint an adjutant, Capt. Ted Kent, on a full time basis. What time was available to me from other duties, I gave to training. Our excellent band was a great asset to promotion of 'esprit de corps'.

Recruiting suitable personnel for officers and other ranks was quickly accomplished. A former officer of the Royal Engineers, Major Harry Strange, gave valuable assistance. He was a talented speaker and had a vivid imagination, tracing the Royal Engineers back to the assault on the "Walls of Jericho", explaining that the trumpeters marched around creating diversion while the engineers were tunnelling under the walls in preparation for demolition to permit entry and capture of the stronghold. Harry concluded with, "There was nothing to it, quite simple for the Engineers."

During the summer at Camp Shilo, there was an amusing incident when we took part in the Decoration Day parade at Brandon in 1940. A number of wives and girl friends came to visit with the troops. There was the usual waiting around period for the order to march. One young officer was sitting in the cab of a truck and was quite embarrassed when his pretty wife jumped up beside him in front of all the troops. Soldiers do not miss the opportunity for fun and as the victim hesitated, a thousand voices shouted, in unison, "Kiss her, for the love of Pete, kiss her."

In December 1940 a call came for twelve engineer lieutenants for active service; no small order. We fulfilled it with inclusion of two architects and one graduate in agriculture, along with two practical engineers, not university graduates, Fred Eaton and Menzie Farquhar from the C.N.R., both of whom had had considerable experience with me. This party reported to the Engineer Training Centre at Petawawa and, after appraisal, a sharp criticism came to us at Winnipeg for submitting other than graduates in engineering. Nevertheless all passed the basic training course, then proceeded to England, proved themselves in active service and were promoted in the field. Captain Fred Eaton was awarded the M.B.E.

## John Volunteered for the Royal Canadian Air Force

This was not surprising. Although Helena and I were fully aware of the odds against those engaged as air crew, we would not have wished John to do otherwise and we were very proud that he took this course. It was during the first year of the conflict,

before the wide extension of training, and there were a number of applicants, so they were being closely screened for acceptance. John was advised that he would be informed when there would be an opportunity for him. He was age twenty, height over six feet and strongly built from active participation in sports, particularly football and hockey, throughout his education at 'sports-minded' St. John's college School, Winnipeg and Pickering College, Newmarket.

During the waiting period, John was employed with a field crew of Manitoba Telephone. It was early in the summer of 1940 when John was instructed to report for service in the R.C.A.F.; being an 'Old Johnian' appeared to have been favourable to him. Regina was the first step for basic training, then to Toronto Manning Depot, on to the Wireless School at Calgary, and gunnery and bombing at Mossbank before Debert for despatch to England.

At Calgary, John and most of his fellow cadets requested Christmas leave, 1940; it was not granted so they took off, en masse, A.W.O.L., 22nd December for their respective homes -- some as far away as Montreal. They were aware that they would be picked up right away if they tried to board the train in Calgary, so went to a way-station a few miles easterly, for an uneventful journey.

Helena and I met John at the C.P.R. station in anticipation of a Merry Christmas together. However, it appeared to me that our son was somewhat apprehensive as he came down the steps from the platform and kissed his mother. We went directly to our suite in the Colony Apartments.

In about thirty minutes the bell rang. I opened the door to be confronted with two Air Force provost. As I was in uniform, they were obligated to salute before stating they had instructions to pick up Cadet John H. Charles; they could hear him in the living room. I said I understood the situation but suggested an alternative, that I would be responsible for my son and ensure that he would leave the following morning to report back to his station. The two provost were sceptical and said that the provost marshal would be displeased, to say the least, if they did not carry out his instructions. However, I had an unfair advantage over them and they went away -- not too happy.

John and I then had a conference. The outcome was that he sent a wire to his Commanding Officer stating he would return by

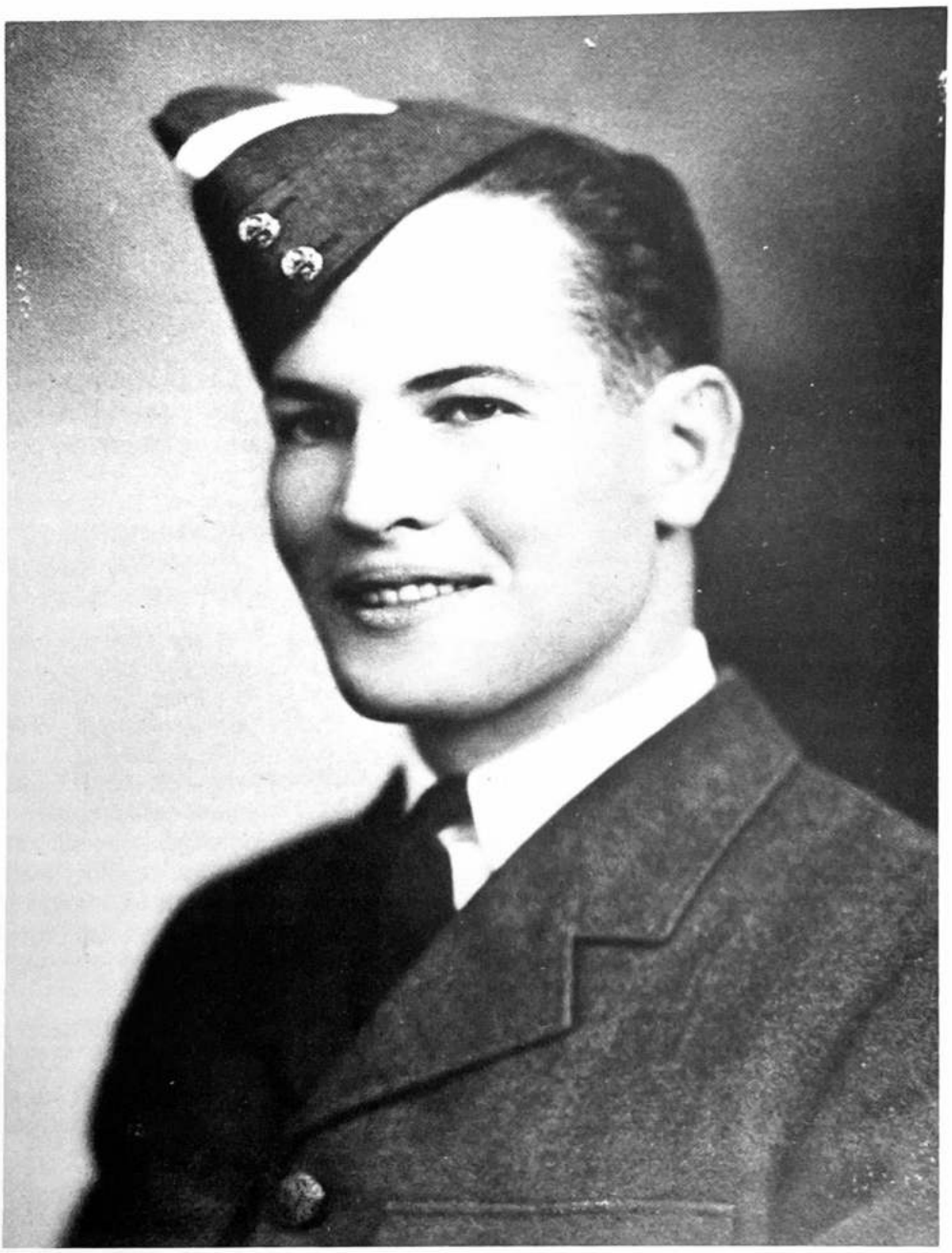
the first train the following morning. John, of course, was raring to go out to meet his Winnipeg girl friend; he had one or more in every port. This would have been madness for if he made a step onto the street he would have been picked up. John suggested dressing in civies; I told him that if he was found without his uniform he would really be in a jam -- A.W.O.L. would change to a much more serious charge. A compromise was reached -- his girl friend was phoned to come over, then Helena and I went out for the evening, content with having circumvented the provosts from hauling John to the guard room!

Next morning it appeared that John would not go any distance before some dedicated provost would take him in, so I decided to accompany him part way to Calgary and have the day with him on the train. As expected, when we entered the rotunda at the C.P.R. station two M.P.'s immediately accosted us but, again, had to pull up short and salute, to our advantage. After a little wrangling they turned about and we proceeded to the train to be confronted once more, but these fellows were old soldiers and more reasonable; in fact we all got together and had a pleasant time. During the stop at Regina, Betty met John, but otherwise all was quiet there. Moose Jaw was the next stop. It was evening, so John thought he would be well to take a berth to roll in and be out of sight until approaching Calgary and I would return to Winnipeg; this was December 24th, 1940.

Helena and I had a quiet Christmas together and in a few days received a letter from John saying there had been no 'reception committee' at Calgary station, so he was able to report with reasonable dignity to the Wireless School. He was placed under open arrest but permitted to accept an invitation for an enjoyable Christmas dinner and, next day, when he was marched before the C.O., it was not too rough. Anyway, we had had a happy visit together although brief and under unusual circumstances. John had a keen sense of humour and made the best of conditions; so ended this escapade.

During the remainder of this winter we were delighted to hear from time to time, on radio, of John being mentioned when playing hockey with the Air Force team; one broadcaster remarked, "If Charles fights overseas as he does on the ice, he will be O.K." John scored twice that evening!

It was toward the end of February that John came home for his last leave before going overseas. We had a happy time together.



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Flight Sergeant John Hamilton Charles, Royal Canadian Air Force, born at Winnipeg, Manitoba, 4th December 1919; died in action 31st May 1942, over Cologne, Germany; interred in the British Commonwealth War Cemetery at Rheinberg, near the border of Holland.

This photograph was taken when John Was a Cadet.

Military Service II

John was habitually full of life and his Mother, although inwardly sad, would never allow such feelings to emerge. I sincerely thought "the Gods" would favour John but knew full well the dangers he would soon face and he was seriously enough minded to realize this too.

There was quite a group of friends at the station to wish John 'Godspeed' as he boarded the train for Debert and he said, "Don't worry Mother, I will be all right, but if I do not land in one piece, you will have happy memories." Our staunch old friend, George Wardrope, who had been so severely wounded during the First World War, turned to me saying, "I have always had a great regard for John, I hope you do not mind that I slipped him a bottle of Ne Plus Ultra." George was an expert judge of Scotch. I certainly did not mind. I had observed that John had learned to use alcohol as a gentleman should.

My friend, District Engineer Gunn at Moncton, visited John when the troop train was being serviced there. It was a thoughtful gesture from one "old Soldier" to a younger one, "picking up the torch".

20th Field Company R.C.E.

Intensive training of personnel at the 10th District Engineers was rewarded by instructions to mobilize a new Field Company for active service to be designated "The Twentieth", with a strength of 6 officers and 254 other ranks. It was indeed a happy day for me to be posted Officer Commanding this new formation, especially after the abortive order to mobilize a Railway Engineering Company two years earlier.

This was announced on parade at Minto Armoury 1st September 1941. There was immediate eager response to volunteer. Capt. Ted Kent, a veteran of the First World War, was dejected that his age prohibited him from being accepted.

The slate of officers selected was, Capt. Wray Jones, 2i/c, and the four section leaders, Lts. Jack Hague, Wes. Gemmel, Bill White and Don Holland; the senior non-commissioned officers were, Mike Keating, sergeant major, Morice Sutherland, quartermaster sergeant, Alex Moir, orderly room sergeant and section sergeants Isaac, Lawson, Aseltine and Humphries. As the establishment called for a

number of technicians and tradesmen, some general recruiting became necessary. It was a busy time for the medical officer and for me, attesting those who passed; I personally interviewed each.

Basic training was the same for all the land services. It was carried out, for those of M.D. 10, at the Portage la Prairie centre. Following this the Company was consolidated at Winnipeg for more specialized instruction in readiness for despatch to wider fields.

The 'Day of Infamy', 7 December 1941, Japanese forces struck, without warning, the United States Pacific base, Pearl Harbour, with devastating casualties; the entire fleet was within the harbour. This was immediate war between the United States and Japan and, subsequently, with Germany and allies. Attention was focused by Canada on our inadequate defences against possible enemy attack on the West Coast. Garrisons at Vancouver, Victoria, Prince Rupert and other vulnerable points were strengthened with troops from the interior; the 20th Fd. Coy. was among them.

We departed from Winnipeg by special CN train, January 5th, wearing winter clothing, including caps with earflaps, to arrive at Vancouver on the second morning in the midst of dense fog. At the rear of the station a complete complement of brand new mechanical equipment was lined up for me to take over and sign for. Being familiar with the topography thereabouts, it was not without apprehensions that the trucks and a station wagon for my use were loaded with our gear and manned with drivers from the Prairies unaccustomed to steep hills and fog. However, we moved off along Main Street, thence over the most beautiful of suspension bridges, to cross the First Narrows and up sharp gradients to the barracks we had been assigned to in North Vancouver.

This initial introduction to West Coast conditions was met without incident, no mishaps in the restricted visibility. We were delighted with our quarters; permanent buildings, the home of the N.P.A.M. 6th Fd. Coy. M.D. 11, now on active service in England. This was excellent accommodation, complete in every respect, including a spacious drill hall, high above the town and overlooking the harbour. Furthermore, we were exclusive tenants and not harassed by H.Q. staff officers. It was up to us to carry on with whatever tasks we were assigned and continue training.

Our cold climate clothing occasioned some stares. I called at the post office wearing my fur cap. The girl at the wicket looked

up and remarked, "My it must be cold where you come from."

The morning following our arrival was clear of fog but raining heavily. The sergeant major addressed me, "Shall I call the parade in the hall or outside?" My reply was, "Outside, we might as well become accustomed to rain now as later."

It was Saturday afternoon when I realized that I had not made arrangements for Sunday church parade, so I drove down the hill to call on the rector of St. John's Anglican Church and enquired if he would provide a service. He readily consented to do so ahead of the regular eleven o'clock service, as there would not be space for us and his normal congregation together.

I had hardly looked for a service with all the 'trimmings', so when we marched in at 0930 hours, it was a delightful surprise to be greeted by the Rector and see his organist and full choir. It was an inspiring service. As we marched out from the church, I was very proud of our Company; all were so well turned out and moved with precision. It appeared this made a favourable impression upon the congregation waiting to enter for regular service.

The next evening some of the ladies and the Anglican Young Peoples' Group from St. John's called on us to offer to put on a social evening. This proved very enjoyable and led to other good times, dances, etc. Also, a Young Women's Business Club in Vancouver city invited the Company to a dance, all of which helped to induce good morale. I made a mental note -- when moving with troops to a new station, to introduce them to the residents, if at all possible, by marching smartly to church.

For hardening Engineers, the area around North Vancouver could not have been bettered. We engaged in long cross-country route marches, one up Grouse Mountain and return directly through the bush; then in the evening entertained our friends to a bang-up dance in the drill hall. The rifle range, in a clearing through heavy timber, was first class. I enjoyed shooting there in the soft light filtering through the tree tops.

Mention of shooting recalls that the entrance to Vancouver Harbour was covered, in part, by an eighteen pounder field piece with an improvised traverse on the North Shore opposite Point Grey. Fortunately the Japanese did not venture to attack Canada's West Coast, excepting the few shells fired during a brief surfacing of a submarine off Estevan Point lighthouse and radio station.

There was no damage but a more determined commander might have sent a landing party ashore to demolish this important establishment, at the time entirely unprotected. The reaction appearing in Vancouver newspapers was, "More millions for Pacific Coast Defences." My cynical thought was that 'some may profit materially while others give their all' -- such is war.

## We Moved to Vancouver Island

Although our temporary home at North Vancouver was indeed comfortable, in fact, pretty soft, we were elated when ordered early in March to join the 13th Brigade, under command of Brigadier Gourlay Colquhoun at Nanaimo. The journey was at night by C.P.R. tug and barge service, in company with a battery of Field Artillery.[5]

The Brigadier was at the dock to take the salute as we disembarked, marching with full packs. I learned later this impressed him, whereas, perhaps with more sense, the Artillery utilized their mechanical equipment to be relieved of packs. Our march, however, on up the steep hill to camp at the base of Mt. Benson did us no harm then, nor our future association with the Brigadier.

It was a damp chilly morning as we pitched tents and set up open air facilities, including cold water showers, beneath some fine old trees. Quite a contrast to the comfortable barracks of North Vancouver. We were very soon at home in this excellent campsite above the city, overlooking the harbour. Our duties were to improve routes for communications and to train within the brigade formation to prepare for defence of Vancouver Island.

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[5]Brigadier W. G. Colquhoun, CBE, MC, enrolled in R.M.C. in 1906 and was posted as Lieutenant to the PPCLI at the outbreak of war, 1914. He was a Sniper Officer at Ypres in 1915; made POW, 27 February 1915. He made attempts to escape but was recaptured when swimming a river near the border of Holland. On return to Canada, 1919, Lieutenant Colquhoun, MC, was promoted to Captain, a member of the Canadian Bisley Team 1925 and, in 1937, to Lieutenant Colonel in command of the PPCLI. He led the famed regiment to England for World War II, he was promoted to Brigadier, 1940, in command of a Trg. Bde. and awarded the CBE, until retirement 1946. A gallant officer and gentleman, of outstanding height, affectionately known as "Shorty", it was an honour to serve under him and to be accepted as a friend until his death at Victoria, age 78 years, in 1966.

Military Service II

Reconnaissance to Nootka

Intelligence, at Victoria, suggested that the enemy might plan a landing at the isolated harbour of Nootka on the West Coast, then break through the uninhabited forest to the main highway along the East Coast, leading to the capital city. Brigadier Colquhoun instructed me to make an appreciation of the situation.

It was decided to conduct a reconnaissance from Campbell River westerly to Nootka. The brigade intelligence officer and a corporal with two sappers from the 20th Fd. Coy. would accompany me. We would drive, by truck and station wagon, from Nanaimo to Campbell River and then take the logging railway to Campbell Lake; thence it would be on foot some fifty miles through mountainous terrain and magnificent virgin timber to the Gold River and along the north shore of the Muchalat Inlet to Nootka Sound facing the open Pacific.

There was a summit pass between Campbell Lake and Gold River, To the north snow-capped Victoria Peak, elevation 7095 feet, was visible and, to the south, Mt. Elkhorn, elevation 7200 feet. There were two main obstacles, heavy dead fall of huge logs and the Gold River.

To progress, it was frequently necessary to walk along the fallen logs, up to eight feet in diameter with slippery rotten bark, and jump from one to another to maintain reasonable direction.

Gold River was three to four feet deep with current too swift to permit wading and difficult to raft. However, we discovered some timber cruisers many years earlier had stretched a cable across the river between two large trees about 200 feet apart and 15 feet above the water level. Further searching disclosed a rusty pulley block which would run along the equally rusty steel cable.

We devised a means to make a harness from our webbing belts, etc. by which we could hitch ourselves, one man at a time, to the pulley in order to make our way over the river. There was a deep sag in the centre of the span which would no doubt be increased when subjected to the weight of a man. It would be easy to glide down to the mid-way point, but considerable effort would be required to pull oneself up the steep incline to the far bank; so we carved a wedge of hard wood to push in between the pulley wheel and the cable to be used as a hold if the passenger had to take a 'breather' when pulling himself up the incline. Also, before commencing the

first crossing, a light line was attached to the pulley so that it could be retrieved after each man completed the crossing. In this manner, the party gained the far bank without incident.

There were two graves there of travellers not so fortunate. We tidied them up and bivouacked for the night. One of the few dry sleeps we had. Generally precipitation was so heavy that it was difficult to gather dry firewood and much patience was called for to coax it to ignite and then to keep it burning.

On reaching the Indian village on the shore of Nootka Sound, we were thoroughly drenched. If we had waded into the 'saltchuck' we would not have been more soaked. The village was entirely deserted as the inhabitants were away on one of their seasonal fishing expeditions. One outstanding dwelling offered dry shelter. Access was simple and inside, lo and behold, a stove and dry wood. It was not long until a welcome fire was roaring and steam rose from our wet garments hanging above. Rations from our packs were supplemented with a deer which had fallen to the one rifle we carried, so a sumptuous meal was enjoyed by the warmth of a fire, under a roof that did not leak.

Typical of soldiers, the fellows ferreted about the village and discovered the Medicine Man's regalia -- masks, rattles and other gear, beautifully carved from cedar. We had fun. The next morning the clouds dispersed and the sun burned off the mist. There was a dugout canoe and paddles sheltered under the building, just the craft we needed to reconnoitre the harbour. It was grand to be out on sparkling saltchuck after traversing dank dark forest. We used the day making sketches and notes, returned the canoe to its shelter and enjoyed another comfortable night under cover; sound sleep induced by the music of the incoming tide lapping on the shore.

The return trip was similar to the outward walk except that it was done in less time. On reaching our transport which we had parked at Campbell River, the boys started south towards Nanaimo, while I detoured to see Ripple Rock. As the boys had missed their beer while in the bush, they naturally made to the nearest source of supply. I caught up to them as they were pulling into a parlor at Courtney. By this time they were feeling no pain, so I said to the corporal, "Go easy." He replied, "Don't worry sir, I just wish you could be with us and have some of the fun we are having." Reassured, I went on my way to report to the Brigadier at Nanaimo.

He invited me to have dinner with him and during the meal I related the amusing incident with my corporal; it brought on a good laugh. "Shorty" was very proud of a sterling silver beer mug which had been presented to him by the Sergeants when he left the "Pats"; he insisted his beer be served in this silver mug. My corporal and sappers arrived in camp late, happy but in good order; fine reliable fellows.

## Sapper Whitey

By reason of his prematurely white hair -- not grey, really white -- although a young man, he was usually called Whitey; I personally recruited him in Winnipeg. He was a miner from Cape Breton Island. In due course he proceeded to Portage la Prairie for basic training. On one visit there to see how my fellows were progressing, the base sergeant-major drew my attention to Whitey and remarked, "You have a rough character there, I would not want him. He has given us trouble and will probably give you a lot too."

The first Saturday evening after our arrival at North Vancouver, I answered a phone call. It was from the Provost's guard room in Vancouver city advising that one of our sappers had been taken in drunk and disorderly. He was Whitey and was marched in before me Monday morning. After hearing the evidence, I informed the defendant that I was aware of his record to date, however, as this was his first offence I had to deal with, the sentence would be admonished.

Next Saturday, Whitey was again taken in under the same charge. I sentenced him to seven days confined to barracks. One evening Whitey was brought into the office to scrub the floor. I was sitting at my desk. Whitey looked directly at me and said, "I am going to make a good job of this Sir, I'll be in here often!"

One could not help liking such a frank fellow. We came to know and understand each other. From time to time, I learned that Whitey had been born into very tough conditions, had 'hell' knocked out of him from an early age at home and in jail, so naturally rebelled against the establishment. He developed into a first-class soldier, always well turned out -- a credit to the 20th Fd. Coy. and his encounters with the M.P. ceased.

## Military Service II

Then came Whitey's turn for leave -- all the way across Canada to Cape Breton Island. There was speculation amongst his compatriots as to whether he would make it and return not under escort. Whitey did make it, although one day overdue, but with good reason as explained in a homely letter from his sister. Of course, he continued to enjoy a few beers but he controlled them. I, too, learned more of human behaviour.

In a tight spot, Whitey would be a stout comrade to have at one's side.

## A Brief Leave

About this season, early spring, it is safe to say there are few, if any, parts of the World more beautiful than Vancouver Island. I believe Rudyard Kipling expressed this strongly about Victoria; there could be no better authority.

A few days leave were due to me so I rented a smart convertible and drove to the city to call for Eira, now a graduate medical technician, assistant to the pathologist at St. Joseph's Hospital.

Under bright sunshine, we drove northerly over the Malahat Lookout, then unspoiled, high above the magnificent shore-line and sparkling water of Brentwood Bay, to Duncan and then turned off to Maple Bay and put up at the peaceful lodge overlooking the salt-chuck, for an enjoyable respite from duty.

## Exercise Ucluelet

It was in April that Brig. Colquhoun organized a full scale exercise to test the defences of Ucluelet Field of the R.C.A.F. on the west coast of the island. The brigade, in convoy, moved off from Nanaimo, through Parksville and through the giant cedar of Cathedral Grove to Port Alberni for embarkation onto R.C.N. craft.

The flotilla sailed along Alberni Inlet and out into Barkley Sound. Then, next morning at dawn our force effected a landing near the Air Field and advanced on it. This taught the Infantry to respect the difficulty of penetrating the dense growth of salal thereabouts.

(2)

Eira Alice Charles born at Deganwy, North Wales, 1st April 1917; graduated from the University of Manitoba, BSc. 1939; wartime assistant to the pathologist at St. Joseph's Hospital, Victoria B.C.; subsequently moved to Halifax, N.S. and Winnipeg, Man.; joined in matrimony with Capt. Rhinehart F. Friesen M.D. Royal Canadian Army Medical Corps, at Winnipeg 1944; they have four children - John H.P. Friesen M.D., Bruce C. Friesen MSc., Gordon R. Friesen and Leslie Anne Friesen.

Military Service II

Before re-embarking to return to Port Alberni, the Brigadier held a very interesting and informative analysis with all the officers taking part in this exercise. Weather conditions were perfect. The sail amongst the picturesque islands in the sound and the scenery along the Inlet were indeed memorable; I certainly enjoyed every hour at sea and on land.

Zombies

A disturbing situation arose during the spring of 1942; volunteer recruiting was not enlisting the number of troops it was estimated would be necessary for reinforcements in support of formations overseas. The government proclaimed a modified form of conscription -- for service in Canada only. These men were dubbed Zombies, "the living dead".

Instructions were issued from Ottawa through the regular channels that all formations would be required to absorb a percentage of Zombies. This created deep antagonism, for we were all very proud that our commands were formed entirely of volunteers with high esprit de corps; to have Zombies forced on us was unthinkable. The government's scheme appeared to be that the Zombies' attitude would be raised by contact with volunteers. In fact, we were instructed to foster the Zombies to volunteer for general service. Officers and all other ranks were extremely resentful.

All commanding officers of the Pacific Command were called to Victoria to hear Colonel Ralston, Minister of Defence, speak on this serious situation and, afterwards, to express opinions. Lt. Col. McGregor, V.C., Canadian Scottish, stood and exclaimed, "I will open this battle," and he did; however, we had to accept Zombies.

## 2. SECONDED TO CORPS OF U.S. ARMY ENGINEERS

At Nanaimo, mid-May 1942, I was surprised to receive a phone call from a senior officer of the U.S. Army Engineers at Seattle and be informed that as the Japanese had occupied positions on the Aleutian Islands, threatening the sea lane between the western States and Alaska, it was deemed necessary to prepare to construct a military railway from the Canadian National System, near Prince George, B.C., to the Alaska State Railway near Fairbanks, a distance of some 1400 miles.

He stated further that this would be in addition to the Alaska Highway which had been commenced from Dawson Creek, B.C., northerly to serve the military air fields on the North-West Staging Route and provide highway communication to Fairbanks and, by air, across the Bering Straits to Russian bases in Siberia.

Then came the question, "Would you accept temporary assignment for duty with the U.S. Army Engineers to survey this proposed military railway, providing arrangements can be made through the Departments of State of Canada and the United States?" I replied, "Yes, on the understanding that when the 20th Fd. Coy. R.C.E. may be warned to proceed Overseas, I will be recalled to resume my command."

I was requested to go to Seattle for a personal conference but was unable to accede as the Inspector General of Canadian Forces in the West, Maj.-Gen. Griesbach[6], was due to arrive at Nanaimo within a few days to inspect the 13th Brigade, so no leaves were being granted. It was then suggested that two U.S. officers would meet me at Vancouver the next evening if I could go there for a brief time. I, of course, immediately reported what had taken place to Brig. Colquhoun and he gave me permission to follow the matter up.

Within a short period orders came through for me to be 'seconded' to the U.S. Army Engineers and to report to the headquarters at Seattle. It was with deep feelings that I said adieu

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[6]Major General Griesbach was one of the most famous Old Boys of St. John's College School. When addressing the annual father and son supper, he said, "Anything I have done in life I owe to the training I received at this school." Headmaster Walter Burman said, "More than 400 boys of the School are serving in the armed forces and many have given their lives."

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to the officers and other ranks of the 20th Fd. Coy. to whom I had become very attached. Then I went to pay my respects to the Brigadier. He enquired, "Charles, how is the order worded?" After I replied it stated 'seconded', Shorty said, "You are sunk. You will be out of our jurisdiction and all they (the U.S.) will be interested in will be that you do a 'job of work' for them, there will be no promotion." This did not sink in at the time but, later, I certainly remembered his friendly comment.

Sunday afternoon, 29 May, spring flowers were ablaze with brilliance and the sea below the heights of the Malahat Drive could not have been more beautiful when I was driven from Nanaimo to Victoria to catch the C.P.R. boat for Seattle. Next morning I reported to Colonel Park and Lt. Col. Truitt for a conference. In the evening I returned to Victoria to prepare for my assignment and organize personnel. It had been impressed on me that speed by every practical means was essential. The survey, 1400 miles through forests and mountain passes of the North, was to be staked on the ground by 30th September and complete maps and profiles were to be submitted by the 10th of October at Seattle, for furtherance to Washington not later than 15th October -- just four and one-half months ahead.

## John was Reported Missing

On Government Street, Victoria, during the evening of 31st May 1942, I was approached by a telegraph messenger who said, "There is an urgent wire for you at the office, the manager thinks you should call for it personally." On arrival there, the kindly gentleman said, as he handed the telegram to me, "I am afraid this contains bad news."

It was from Defence Headquarters stating Flt. Sgt. John Hamilton Charles was missing following a bombing mission during the night 30th/31st May and that when further information was known, it would be forwarded immediately.

After gathering myself together, I had one thought. I must go to John's mother to be with her when this tragedy would strike her. To do so would require leave from the U.S. Army at Seattle. I phoned Lt. Col. Truitt. He was not sympathetic but his superior, Colonel Park, who evidently was listening on an extension, cut in and I was granted three days to go to Winnipeg and return.

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Then I obtained a seat on the first flight east by Trans-Canada Air Lines and, while waiting for it, I went to St. Joseph's Hospital to tell Eira about her brother. It was a great shock to her but she took it as a 'soldier' and gave me support.

The flight encountered a terrific electrical storm over the mountains near Hope and was obliged to return to Vancouver for a few hours before it could proceed. On arrival at Winnipeg, I found that Helena was with her elder sister, Carrie, at Grand Marais; this was fortunate, but it was another two hours before I could be there.

Helena had always been strong in the face of tragedy; she did not break down now that the best of her life was shattered. She almost gave her life for the birth of John and they were ALL to each other. However, we yet had hope that John might have landed by parachute and be found as a prisoner of war; this gave us solace. I stayed overnight but was obliged to leave the next afternoon, thankful that Helena was with Carrie and Joe Cameron, two of the kindest persons; they had been a support to us during previous emergencies.

The International Red Cross gave us from time to time whatever information that grand organization was able to obtain. Then we received a letter, dated 13th June, from Wing Commander Cord, R.A.F., at Syerston, Newark, Nottinghamshire -- in part, "His (John's) crew was an exceptionally good one, and we are all very distressed and anxiously awaiting news which we hope will be of the best. Your son has been with the Squadron many months, along with a large number of Canadians, and it was a pleasure to have them all with us. We owe a lot to these grand boys from the Dominions, for they are doing a marvellous job of work with us. On this ill-fated night, the Royal Air Force made the first of these heavy raids which will make history, and it is with sincere regret that your son will not be with us to continue the good work. He was decidely popular in the Squadron and was always most courageous. We miss him very much."

We continued to have hope until the end of August when the Red Cross discovered that the Germans had buried John's body in the cemetery at South Cologne.

The Winnipeg Free Press reported, "Flight Sergeant Charles, Air Gunner, enlisted in July 1940 and went overseas in March 1941. His last operation was when he flew in a four-engined Avro-Lancaster bomber, one of the 1000 planes that made the first mass raid on Cologne.

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"A rugby and hockey player during his years at St. John's College School, Flight Sergeant Charles in his letters home always stressed the importance of team play in bomber crews. This was also emphasized by his Commanding Officer, Squadron Leader J. S. Forsyth, R.A.F., in a letter to Flight Sergeant Charles' parents -- 'Not one of the bomber crew escaped disaster, I can but say that each one died as he worked - courageously with that wonderful spirit of attack to the fore, and willing to give his all in the great cause for which we fight.'"

John was "Posthumously awarded the Operational Wings of the Royal Canadian Air Force in recognition of his gallant service in action against the enemy." After the utter defeat of the unrighteous, John's earthly remains were moved from Cologne to a beautifully landscaped and maintained British Commonwealth Cemetery in the countryside close to the small town of Rheinberg, near the border between Germany and Holland.

The Trans-Canada - Alaska Military Railway

The location survey for this line, 1400 miles, was the project I was engaged on with the U.S. Army Engineers, to be staked on the ground and maps completed within four and one-half months.

In consultation with Mr. F. Green, Surveyor General of British Columbia, it appeared that the Rocky Mountain trench northerly of Prince George would be the most practical route which could be quickly established to meet the controlling criteria set by the U.S. Army...maximum rate of gradient 2 per cent compensated for curvature and maximum rate of curve 10 degrees.

The "trench" is a natural phenomenon, amazingly direct north westerly between the main Rocky Mountains and the Coastal Ranges, with very favourable topography with respect to mountain territory.

At Prince George, situated by the confluence of the Nechako River with the Fraser, the Trench leaves the influence of waters flowing to the Pacific Ocean, to surmount the extraordinary low summit, 2318 ft. a.s.l., to the valleys draining to the Arctic Ocean, by a number of outstanding geographical features.

One that has had particular fascination for me is Finlay Forks, where the Parsnip River flowing northward collides head

on with the Finlay coursing southward, then the combined volume becomes the mighty Peace River and turns directly east cutting through the Rocky Mountains, at an elevation of only 2100 feet a.s.l., and roaring between the walls of the canyon, which has now been harnessed by construction of the Bennett Dam near Hudson Hope to form a huge reservoir, Williston Lake, inundating Finlay Forks...the site of many interesting happenings which will be related further along.

The ascent from the "Forks" is along the valley of the Finlay, passing by Fort Grahame; and adjacent Police Meadow where the Northwest Mounted Police wintered during their expedition to 'maintain the right' about the Klondike Gold Fields of 1898; thence on by Fort Ware and Fox River to Sifton Pass, elevation 3273 feet; lonely in its isolation, it is the principal controlling feature between Prince George and the northern boundary of British Columbia.

To the north of Sifton Pass the waters are tributary to the Liard River which also cuts through the Rockies via truly formidable canyons to a confluence with the great river of the North, the Mackenzie, and mingles with the volume from the Peace and other waters flowing from Great Slave Lake. The legendary Tropical Valley, also known as the "Headless Valley", on the Nahanni, of which numerous horrific stories have been told, is tributary to the Liard.

At Lower Post, elevation 1913, the route crosses the Liard River and ascends by it and Frances River to Finlayson Lake, elevation 3105, then descends via the Little Salmon to join the Yukon River at Carmacks and crosses this famed river at Five Finger Rapids where so many drowned when lured by gold. Below the rapids there is a majestic reach of river where the current has landscaped a symmetrical bend in a high bank of sand and gravel topped with stands of jackpine and aspen, a supreme work of nature, approaching the hamlet of Minto.[7]

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[7]The village of Carmacks is named for George Carmack, who, with his two Indian brothers-in-law, Skookum Jim and Tagish Charlie, in 1896, discovered the wealth of gold on Rabbit Creek, renamed Bonanza, and instigated the stampede to the Klondike.

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We are now on the left bank of the Yukon to the confluence with the White River which is ascended for a few miles to gain access to the Ladue and to cross the International border into Alaska, then over the headwaters of the Ladue, elevation 1480 feet, into the wide valley of the Tanana to connect with the Alaska State Railway, near Fairbanks, the terminus of this wonderfully direct route from Prince George.

While aerial reconnaissance proceeded, base offices were set up in Prince George and Whitehorse with the necessary drafting and clerical staffs.

## Personnel was Extremely Scarce

Under war-time conditions it was very difficult to obtain the engineers, technicians and relative personnel to man the thirteen field parties required to survey the location for this proposed lengthy railway, within the restricted time laid down.

Concurrently, surveys and construction of the Alaska Highway, from Dawson Creek along the eastern slope of the Rockies to Fort Nelson, thence through the ranges to Whitehorse and Fairbanks, were in progress; so every source, both military and civil, had to be drained to obtain men, with even meager qualifications, for this railway project.[8]

Only two engineers were available from the Canadian Army, Lt. Jack Hague of 20th R.C.E. was one. Canadian National Railways granted leave of absence to A. J. (Scotty) Morris, Office Engineer, and from the field, George Wardrope and Harold Nunn, and draftsmen Jim Walker and Percy Curd; all first-class professionals with many years of experience; also two juniors, Doug Worby and Jim Bremner.

Bill Phillips, another old-time CN draftsman and excellent mathematician, had enlisted in the Veterans Guard when his two sons became casualties during the tragic battles at Hong Kong. Bill was on routine duty at Victoria; through my connections at

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[8]Construction of the Alaska Highway was commenced during March 1942, from Dawson Creek, B.C., the northern terminus of the Northern Alberta Railways, to Fairbanks, Alaska... a distance of 1523 miles, of which eighty per cent is in Canada.

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Pacific Command HQ he was assigned to duty on the railway survey.

A few other Canadians, with knowledge of railway location, were recruited. Mr. L. C. Gunn -- no more experienced location engineer and gentleman could be found -- was semi-retired at Prince George and he graciously volunteered to take charge of a party... under the direction of the 'kid' he had started on the G.T.P.R. thirty-two years ago. Chief Gunn was a 'God-send'. Rodmen, chainmen, axemen, cooks, boatmen and packers were recruited locally.

U.S. Army Engineers assembled parties at Seattle and sent some to Prince George, Whitehorse and Fairbanks, respectively. We were well supported with aircraft and first-class pilots from Seattle.

## Headquarters at Prince George

Base office was set up at Prince George with Scotty Morris in charge of mapping and estimating and a representative of U.S. Treasury was responsible for purchase of supplies and financial matters. Field survey was commenced June 1st 1942, to run initial preliminary lines and stake the railway centre line, 1400 miles, through heavily forested mountain country with four months, September 30th, emphatically set for completion.

This was accomplished with an average of ten survey parties and logistics by local rivermen, trappers and packers. Initial action on my part was aerial reconnaissance and directing the parties to strategic points for commencing work and showing the respective engineers controlling topographical features.

I was instructed to report progress in writing bi-weekly to the senior U.S. Army Engineer at Seattle. Under the circumstances, it appeared to me to be unnecessary and time consuming to make the long trips to Prince George, so after submitting the first report, I stayed in the field. However, a plane was dispatched to find me and deliver mandatory instructions to comply...so be it!

## In the Field

A light Waco bi-plane on floats was my personal means of

transport. There were many convenient rivers and lakes for landings. The pilot, a hunchback from being injured by a package falling through a ship's hatch, was meticulous; before taking off he insisted that I swatted every last mosquito as a precaution against one buzzing onto his nose at a critical moment and, also, that I coiled the mooring lines precisely -- he was tops. Caches of aviation gas were freighted in by boat and/or aircraft.

One cache was at Fort Ware, a very isolated Hudson's Bay Company sub-post by the Upper Finlay River. An old Indian couple, deeply wrinkled by exposure to years of hardships, would sit on the river bank and stoically watch us. The current was swift and at times carried whole trees, roots and all, scoured from banks upstream. When we would return the silent observers were always there, seemingly never moving.

On the shore of a small lake near the summit of Sifton Pass, a desolate spot with but one lone log cabin, we would at times see an aged couple. Invariably when we landed, we would be greeted with, "Where you go? Maybe Lower Post?" To our reply, "Maybe", he would say, "Son-of-a-bitch white man take my daughter, promised send money, no do, tell him old people starving." No doubt they were near to starvation. On the interior walls of the meagre cabin, dark with smoke from an improvised stove, notes were inscribed, for example, "Hungry, three weeks see no game."[9]

Between Fort Ware, through Sifton Pass, and Lower Post some 250 miles, there is no habitation except for infrequent Indian hunters, and ground travel is on foot or horseback, therefore the two railway location parties working there were supplied and moved by pack trains. We were very fortunate to engage Mr. J. O. Davidson, generally known as "Skook", short for "Skookum", literally meaning 'capable' or'excellent'...thus a mark of deep respect. Skook and all about him, assistant packers, horses,

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[9]In this territory, it was customary for a groom taking an Indian girl as bride, to trap the following year with the girl's parents. In this case the "S.O.B. of a White Man" had agreed to an alternative -- send money!

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dogs, saddles and other gear, were indeed first class.[10]

When wishing to check conditions of the terrain, I would drop a note from the Waco into Skook's camp, requesting him to meet me with a saddle horse at the nearest landing point. We often rode together and became close friends. Skook was always an optimist and, when feeling especially high spirited, he sang a lively ballad as we rode along, with his dog wagging its tail high. It was good to be with such an understanding human character.

Riders of the trail were infrequent and perhaps at times lonely; they would blaze a tree and write a note, most of them were gloomy, "no game" etc., but one day we read a cheerful note, "Glorious, glorious day, springtime in the Rockies."

Fire in Sifton Pass

During July, on a flight southerly from Lower Post, we suddenly found Sifton Pass to be choked with dense smoke from forest fires. There was no way open to proceed, above or underneath, the only option was a tight bank to retreat.

The ceiling of the Waco did not permit flying over mountain ranges, so we were faced with a long circuitous detour by retracing our route along the Kechika Valley to the confluence with the Turnagain River; thence westerly to Dease River and Dease Lake, where we hoped to obtain gas and stay overnight. Approaching the north end of this lake a steep descent was made to about five feet above the water, then swift flight along the 30 miles to the H.B.C. post; the pilot turned to me saying, "I thought you would

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[10]As a young man, Skook emigrated from the Scottish Highlands and commenced packing on the Cariboo Trail, to progress northerly to his home ranch in the upper valley of Kechika River, from where he operated pack trains to service exploration parties, also as outfitter and guide for big game hunters. Skook had an outstanding service record; a "Scout Sergeant" during World War I, he was awarded the Distinguished Conduct Medal and Bar. It is sad that a few years ago fire destroyed his ranch home, and well-documented diaries, medals and other valuables; and, now, Skook is in a home for the aged at North Vancouver -- a terrible lingering end to life for a grand old "mountain man" who deserved quick death.

enjoy that!" It was indeed exhilarating, so close, between the grandeur of rugged mountains. We were received with characteristic northern hospitality.

After the morning mist burned off we struck out for the Stikine and ascended its valley through wild beauty, spotting many moose, caribou and bear, seldom disturbed by man. Thence a tributary led to a point where we were able to cross the Omineca Range and discern water descending towards the Finlay River and thus to our gas cache at Fort Ware. As usual, the aged Indian couple was there, watching the swift water roll along. The long detour was indeed an entrancing flight...to ascend an unknown way through remote mountain valleys, closely observing the flow of streams as they decreased in volume to become but a trickle fed from a gleaming glacier or lake near the summit, then to note the outflow increasing in volume towards the direction desired.

Fort Ware

This sub-post was situated at the confluence of the Fox River and Finlay River, 300 direct air miles north of Prince George. It was managed by a young trader with his wife and two lovely little sons; excepting for a few Indians, their closest neighbors were eighty miles away at Fort Grahame. We were always given a hearty welcome and invited to roll our eiderdowns on the kitchen floor. When north-bound we would take in a few treats -- fresh tomatoes, lettuce, celery and chocolates, and had many delightful overnight stops.

Mt. LLoyd George, elevation 9550 feet, in the main range of the Rockies is fifty miles north-east of Ware and host to massive glaciers which glisten with grand brilliance during clear sunshine; they fascinated me and one ideal day lured me to explore.

The Waco would seat three without baggage, so we invited the young wife to accompany us. She eagerly accepted a break from routine at the lonesome post. We had a wonderful flight about the face of the masses of ice and snow; also, just below the tree line we had fun zooming a magnificent grizzly bear, so close to him that the silver tips of hair were clearly visible. This courageous animal stood erect on hind feet and clawed the air with forepaws.

When we landed on the river and threw a line to hubby on the

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bank, he exclaimed, "Boy, am I glad you are back! I had a devil of a time consoling the boys; they thought their Mother had left them." Poor kids, they were really alarmed.

After this flight I was concerned with my companion's departure to become a test pilot; however, he was replaced with another excellent fellow -- Les Bullis.

Finlay Forks

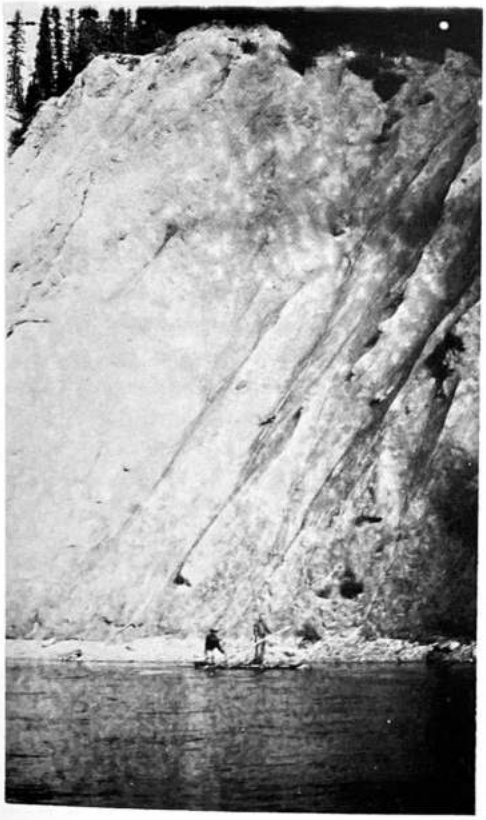
This unique meeting of the waters -- the Parsnip, Finlay, Manson, Omineca and Ospika -- is magnificent; two large rivers, the Parsnip flowing northerly and the Finlay southerly, clash head on at the 'forks', mingle to become the mighty Peace River striking due easterly through the Rocky Mountains between peaks towering to 10,000 feet. To my knowledge, there is no other such dramatic geographic feature.

My first landing was just after spring break up, 1942. Drift logs were swirling about in the turbulent water. The tiny community on the west bank was home to one trader and a few trappers. Standing on one float as we taxied in, I cast a line to a rugged character waiting on the bank and then jumped ashore. To my surprise, the old timer was Mort Tier of the ill-fated trek to stake coal claims south-westerly of Bickerdike during the spring of 1911 and, together with his brother Bill and two companions, had operated from Tete Jaune Cache until 1913. When the hubbub of railway construction ruined their domain, they departed for virgin fields in the Peace Country. It was a great pleasure to again fall in with this grand old gentleman, erect and capable of packing 100 lbs. on his back over mountain trails, summer and winter.

One evening early in September, the sun was setting in a blaze of glory when Les and I took off from the river at Ware for Prince George, planning to take on fuel and rest overnight at the Forks. However a full moon promised clear visibility for several hours. Against better judgement, we decided to continue rather than await morning. Flying below the elevation of the mountain ranges, every bend of the Parsnip and Pack Rivers was easily recognizable by the soft moonlight and on over McLeod Lake and Crooked River to Summit Lake; but, soon the delightful

(3) Some members on the location survey for the U.S. Army proposed railway from Prince George, B.C. to Fairbanks, Alaska, - left to right J.L.C., Percy Curd, Jim Walker and Les Bullis with his arm on the post; and, on the far right L.C. Gunn, at Finlay Forks September 1942.

(4) Junker's and Waco on the Finlay River at Fort Ware.



(5) Reconnaissance of Fox River by raft

(6) Taylor Craft on Finlay River near the forks

Seconded to Corps of U.S. Army Engineers

'moonscape' changed drastically.[11]

Below the high cut bank at the confluence of the Nechako and Fraser, the valley was filled with 'cotton-wool', not a break in the clouds and the gas tanks were nearly empty. Luck was good. Les made a few circuits, spotted an opening and dove down for a perfect landing on the Fraser. We tied up at our usual mooring, shouldered our packs to walk to the hotel up-town. It was after midnight. An auto came towards us and pulled up. The driver was the highway district engineer. He said he had been awakened by a terrific bang and thought a serious mishap had occurred on or near the river. We reasoned that the sound of the floats striking the water had oscillated violently beneath the low cloud blanket.

We were given a lift to the hotel and found good "old Scotty" had been awakened too and was waiting with stiff drinks all around; Scotty never failed to be on hand with a pick-me-up!

Taylor Craft

For carrying mail and other light tasks, we had a Taylor Craft, a really light plane -- wire, fabric and 60 h.p. engine -- pilot and one passenger could squeeze in. It was excellent for the job and very reliable and the pilot was good too. I flew with him at times when the Waco was being serviced. He observed thermal currents as a glider pilot would do and enjoyed to exhibit his skill.

When going in to land at Forks, the keen-sighted fellow spotted five timber wolves on the shore of the small lake, amidst tall spruce, on the east side of the Finlay River. He noted their position, then landed at camp and picked up an Indian boatman to point out the wolves. He then landed on the river to put the Indian ashore, who then crept through to the spot and bagged the large wolves...quite a feat.

Heavy Freight

Canadian Pacific operated for the B.C. Forest Service and also

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[11]Fort McLeod was established by Simon Fraser, 1805.

charter flights from a base by Stuart Lake at Fort St. James -- the original capital of British Columbia. Famed Russ Baker, subsequently president of Pacific Western Air Lines, was in charge and piloted a renowned all metal Junker. Russ was familiar with every feature far to the North, but never took unnecessary chances. He said, "Most of my compatriots are dead, but I am here." He was a close friend to Skook Davidson; both were robust men, capable to contend with the adverse conditions which occur in the vast region they served.

## Completion of the Project

Readers, judging descriptions of diversions described above, may question some of my activities. I hope they will recall, "All work and no play makes Jack a dull boy!"

We gave the project unstinted attention, seven days weekly... long days, as possible during summer in northern latitudes. The field work, 1400 miles of line, was completed within the four months, by 30th September; plans, profiles, estimates of cost to construct and initial program were delivered to the U.S. Army Engineers at Seattle on 10th October, to be forwarded to Washington by 15th October 1942.

Fortunately, it was but a short time until the Japanese retreated from the Aleutian Islands; thus potential danger to shipping to Alaska was relieved and need for a military railway was immediately redundant...Thank God.[12]

Service with the U.S. Forces was informative, but with respect to railway location surveys, there were no advancements beyond current Canadian practices. We had been led to believe that the U.S. operated with less 'red tape'; I found this was a fallacy.

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[12]The wonderfully direct route northerly from Prince George, via the Rocky Mountain Trench, would now appear to be impractical. Construction of the Bennett Dam on the Peace River at Rocky Mountain Canyon, near Hudson Hope, has formed a vast reservoir within the Trench; water level is 200 feet above Finlay Forks and the beautiful natural environment is not as it was.

For example, I hired a trapper -- who could live off the country (if ever there was a hardy, competent mountain man, he was one) -- as guide and hunter for a party with meagre experience, working from Fort Ware towards Sifton Pass. Bureaucracy refused to include this man on the payroll. He should be sent to Prince George for a medical examination. I declined to do this; his local knowledge was vital to the progress of the respective party in the field. The outcome was that a doctor was flown from Prince George to Fort Ware to fulfil regulations.

American personnel returned to Seattle and Canadians were posted to R.C.E. at Chilliwack; I was instructed to report to Headquarters 8th Div. at Prince George, part of the Pacific Defences.

Brig. Colquhoun's remark to me, when leaving his command to be 'seconded' to U.S. Engineers, "You are sunk, etc." was only too true. My pay as major was $7.75 per day, in responsible charge of an urgent project, whereas U.S. citizens, under my direction, enjoyed several times that rate, and some had a tendency to extol this.

So, it was but natural at times to inwardly resent the circumstances, but this was somewhat shameful in comparison with the unselfish attitude of Pte. W. Philips, 'seconded' from the Veteran's Guard to the Corps of U.S. Engineers, at $1.50 per day. Yet we never heard the slightest grumble from him. Bill's situation worried me. I endeavoured to rectify it but had no success, so apologized to him. With a smile he said, "It is of no concern, we are winning the war." A truly loyal magnanimous gentleman.

Canada, however, did do all possible. I was granted 'flying pay', $2.00 per day, and this relieved me from income tax as were officers serving Overseas. I would not have wished to miss the exercise, especially as 'records' discovered I was in my fiftieth year which would prohibit me from proceeding to Europe.

## 3. RETURN TO THE ROYAL CANADIAN ENGINEERS

November 1942 orders came from H.Q. Pacific Command to me to report to Colonel Swan, Chief Engineer.[13] Scenery along the Pacific Great Eastern Railway is indeed spectacular, so I requested transportation from Prince George by bus to board the train at Quesnel -- northern terminus of the partly constructed line -- for Squamish and thence by coastal steamship to Vancouver.

Landslides at the crossing of the Cottonwood River halted construction for some years beyond Quesnel and obvious extremely heavy costs to build along the rugged coastline southerly from Squamish caused deferment of building into Vancouver.

The P.G.E. was commonly referred to as, "Please Go Easy"; it offered a charming comfortable journey in the one Pullman car, with a coloured gentleman to serve quite good meals and attend to all other wants of his guests. On this particular run there were five passengers, all northerners who, together with our friendly host, soon became a merry group.

Much of the route is adjacent to the Fraser River; and the Caribou Trail with historic names...150 Mile House and 100 Mile House... recalls the era of the Gold Rush. At Lilloet we were informed that the line ahead was obstructed by a landslide and it would be necessary to detrain and go by bus to Lytton and catch either the C.N.R. or C.P.R. to complete our journey, so we missed the ship trip. However, a journey on the completed line -- now B.C.R. -- Vancouver to Prince George and northerly is an experience one should not miss.

### Reconnaissance for a Highway

Headquarters of the Canadian 8th Division was at Prince George, a central location with respect to defence of northern British Columbia, but there was no direct surface connection with the United States forces on the Alaska Highway, so consideration was given to rectifying this situation and I was detailed to make a survey.

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[13] Colonel W. Swan, D.S.O., O.B.E., Croix de Guerre, with whom I had been associated in the Ypres Salient during 1917. It was a pleasure to come under his command. Subsequently he developed an eminent consulting practice -- Swan & Wooster.

Return to the Royal Canadian Engineers

Commencing from Prince George, with three sappers and two jeeps, the route was westerly by highway through Vanderhoof to Fort St. James, thence by a bush trail, just passable, to Manson Creek. Then there was a long gap to be traversed on foot through Finlay Forks and the Peace Pass to Gold Bar, near Hudson Hope.

Charlie Adams, an old-time prospector friend, was residing at Fort St. James and as Christmas was but a few days ahead, kind-hearted Mrs. Adams insisted on entertaining us to a delicious turkey dinner before we proceeded.

From a point near Manson Creek, the sappers with the jeeps returned to Prince George and Charlie and I pushed into the bush via the pass through the mountains to Finlay Forks. We were fortunate to connect with a plane going to Prince George which enabled me to make a preliminary report.

This was around New Year's celebrations. "Skook" Davidson, who packed for the summer survey through Sifton Pass, was in town and had money... so many friends too! The Provincial Police received information that an Indian woman had been found dead near Fort Ware, Skook's territory, so they swore him in and outfitted him with badge and a pair of modern handcuffs to assist in the investigation.

Bad weather delayed take-off. An American Air Force officer, also grounded, was sitting by the big open fire-place at the hotel. Skook, full of fun, snapped his handcuffs around the major's wrist and an arm of the chair and sauntered off with the key. That evening it was decided tables should be turned on Skook. The pranksters silently entered his room, moored him to the bed and departed with the handcuff key. Skook described this to me in his earnest manner, eye to eye. "I had one hell of a time getting my pants on. You try it some time!"

The weather cleared and we took off with Russ Baker in his Junkers for Finlay Forks, carrying delayed Christmas mail and New Year's cheer. The little community consisted of a general store with post office and Government telegraph and weather station, also prospector-trappers would drop in. These fine people had been waiting patiently for arrival of Russ's cargo and so naturally most of them were soon elated.

I was invited by the telegraph operator and his wife to stay with them. The good lady was somewhat stiffer than an exuberant

young woman who came around to exclaim, "I want that man with the ground-off teeth"[14] but, out of respect to my hosts, it appeared I should be somewhat circumspect. Then the caller, full of wholesome fun, exclaimed, "Won't anyone come out to play with me?"

It was a clear sub-zero evening with Northern lights flashing and crackling across the heavens above the Forks, the confluence of the Parsnip and Finlay rivers verging to form the great Peace River and flow easterly between the snow-capped mountains of the Rockies... indeed an impressive sculpture of nature in comparison with the mere image of mankind.

Next morning water was dripping from the cabin eaves. The amazing phenomenon, a Chinook, warm wind from the Pacific, had burst through passes of the Coast Ranges causing a sudden rise of temperature. This presented Jim VanSomer and me with unfavourable walking conditions, especially as our footwear was moccasins which would immediately become sopping wet in the soft snow and water on the river ice.[15]

An Indian family, camping nearby, had some pack dogs. We purchased two for $5.00 each, including collars, chains and canvas panniers. They could pack fifteen or so pounds a piece and we each handled forty pounds -- light eiderdown bed rolls, bare rations, cooking utensils, spare socks and razor, etc.

We bid adieu and set off slopping through water. By noon it was up to four inches deep above the ice. Instead of using snow-shoes, we had to carry them. High-wind velocity from the West propelled us easterly; however, wet moccasins on slippery ice made it difficult to maintain a footing and strained leg ligaments and muscles.

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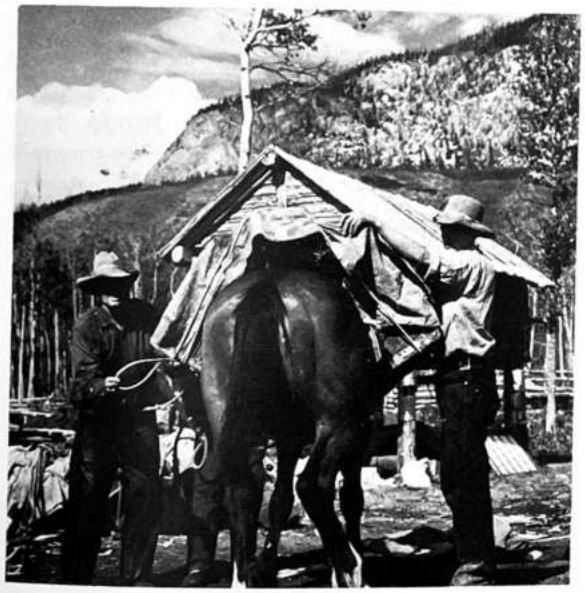
[14]This was the first realization that some front teeth, broken by a cricket ball, were such an identifying mark.

[15]Jim was an expert boatman and trapper, on the previous summer's survey. I met him in town and invited him to accompany me through the Peace Pass.

(7)

J.O. Davidson outfitter and guide Northern B.C. and the Yukon. 'Skook' wrote on the back of this photo "On hunting trip, the hard looking gent on the right is me, I always think the sheep should have a gun too".



(9) Jim VanSomer, with pack dog, near the end of 'recce' from Finlay Forks to Hudson Hope, through the Peace River Pass February 1943.

8)

Skook' throwing a diamond hitch at
is home ranch 'Diamond J' at base of
erminus Mt., Kechika R. valley, B.C.

As we did not know our two dogs, it appeared advisable to lead them but after the first day we found this to be unnecessary. They were good companions and in the morning wagged their tails when being packed. Each evening Jim set snares for rabbits.

On the second afternoon we came to a lone trapper in a small cabin at the mouth of Wicked River. He was mixing dough to bake bread -- flour from head to foot -- and greeted us warmly for he had had no company since freeze-up. This lonely fellow came by water early in the spring in hope of panning for gold but had very little success and now was endeavouring to eke a living by trapping, also with very little to show for his efforts, but he was proud nevertheless.[16]

We were pleased that we had an emergency bottle of rum and were able to give the old fellow a shot and a small canned Christmas cake, which the G.S.O.I. at 8th Div. had received from his wife and insisted that I take. Our new acquaintance endeavoured to persuade us to say overnight but although it was approaching sunset, we thanked him and pushed on a couple of miles to make camp with a bright open fire and sparks going skyward -- real comfort.

Daily we took notes of the topography, distances, dimensions of rivers and other water courses, also of snow and rock slides and other features which would affect highway construction.

Evening of the fifth day we arrived at Jim Beatty's ranch, Gold Bar; the end of the trail 30 miles west of Hudson Hope. This was no ordinary homestead. It was a substantial two-storey log home, with running water piped in from a nearby mountain stream; there was just about everything to make life good. Jim VanSomer was a close friend of the hospitable Beatty family, so we had a very enjoyable stopover.[17]

Construction of the Grand Trunk Pacific Railway through Tete Jaune in 1913 disrupted Jim's way of life there so he and the Tier brothers pulled up stakes and set out for new frontiers in the

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[16] Unemployment insurance and 'relief' were unheard of then.

[17] Jim Beatty's ideal homestead is now under the surface of Williston Lake, impounded by Bennett Dam.

Peace Country. During travels about there, Jim planted potatoes at several locations. Gold Bar yielded the best crop so there he settled, together with his bride from Edmonton, and prospered. On the river flat he had an extensive area under cultivation and, nearby, there was ample range for cattle and horses. Garden products and wild fruits were luxuriant. Mrs. Beatty showed me her loaded basement shelves and venison hanging frozen in the verandah.

The Chinook wind had now exhausted itself and the temperature dropped to fifty below, quite a dramatic change. In the morning Miss Beatty harnessed a team of lively horses to go for a sleigh-load of oats from an outfarm, mid-way between Gold Bar and Hudson Hope. Jim and I had a delightful drive and bunks overnight with the self-sufficient charming teenager.

A half-day walk, accompanied by our two dogs, now fast friends, took us to the comfortable log hotel at Hudson Hope and telegraph communication with Fort St. John, H.Q. of U.S. Army constructing the Alaska Highway. In response to a message advising my arrival, a staff car was promptly dispatched to pick up Jim and me. In the meantime we sold our dogs for $5.00; considering their cost was but $10.00, they gave the most economical transport I have had.

The Commandant could not have been more hospitable. A gracious touch was my name, Major J. L. Charles, Royal Canadian Engineers, painted on the door of the room assigned to me and I was taken wholeheartedly into the H.Q. Officers' mess. Thus ended the field part of this interesting and enjoyable mission.

As there was mutual interest in the possibility of a more direct highway surface connection between U.S. and Canadian forces than by the long long way around, through Edmonton, the Colonel was interested in my verbal report and reciprocated by making a car with a driver available to me to observe the rapid progress being achieved on the Alaska Highway.

Return by aircraft to Edmonton, thence by train to Prince George, was uneventful. My report with map was completed in two days and I was ordered to H.Q. at Vancouver where I was privileged to personally describe to the G.O.C. my observations of the features to be contended with to construct and to maintain the highway under study.

Afterwards, routine duties on Colonel Swan's staff were far

(10)

(11)

Helena during 1942 with four leaf clover brooch, she frequently searched and found four leaf clovers, said to be lucky.
Lower - J.L. C. with pack dog on the Peace River at base of slide from Mt. Chrysdale, near Finlay Forks, January 1943.

from exciting but were somewhat compensated for by being billeted with the Artillery Mess in a fine old home on beautiful Point Grey, in springtime, pending my recall to Canadian National Railways.

## 4. RECALL TO CANADIAN NATIONAL RAILWAYS

During April 1943, when I was more or less marking time at H.Q. Pacific Command, Vancouver, on the staff of the Chief Engineer, it came as a surprise to me to be informed that Mr. R. C. Vaughan, President, Canadian National Railways, had requested the Department of National Defence to allow my return to the Railway to direct surveys and construction of special projects related to Canada's wartime industrial production -- in particular, railway facilities to serve Steep Rock Iron Mines being developed near Atikokan, Ontario, and for the transfer of ore from rail to water transport at the 'Head of the Great Lakes' now known as Thunder Bay.

My feelings were mixed, for I had always enjoyed service and the camaraderie in the forces so I was hesitant to leave. However, being an 'Old Soldier' in his fifty-first year, it was obvious that future army service would be restricted to administration and instructional cadres within Canada -- not exciting -- so it seemed advisable to assess the long-term situation.

Howard Dixon, Jr., who had worked with me during university summer vacations, was an officer in the R.C.A.F. at Vancouver. We met often and his wife, Barbara, invited me to dinner from time to time. Although Howard did not say directly that it was advisable for me to return to the Railway, it appeared that he was more informed than he was at liberty to divulge, but the inference was that I should accept when the situation was favourable for me.

On the other hand, preparations were progressing for a Canadian contingent, including Engineers, to take part with the U.S.A. forces to drive the Japanese from their foothold on the Aleutian Islands off the coast of Alaska. The Chief Engineer wished to retain me.

Mr. W. R. Devenish, V.P. Western Region, C.N.R., personally phoned Colonel Swan and, after some discussion, it was agreed that I should return to railway service. Very shortly I received instructions to report to Mr. J. W. Porter, Chief Engineer, Winnipeg, to be Principal Assistant Engineer, rate $420. per month. Although I appreciated this, I was not too happy and remember that when receiving formal orders from a senior staff officer, an 'Old Soldier' too, he remarked, "I wish the C.N.R. President would request me."

Fourth row;- centre Bill Walkden, second from right Harry Rimmington.

Third row:- left Cy. Stout, right Bob Ross,

(12)

Tom White, District Engineer Alberta, retired at Edmonton 28th November 1946; front row - St. John Munroe, Bill Logan, and Herb Roblin who succeeded Tom; second row J.W. Porter, T.W. White, J.L.C. and H.A. Dixon.

(14)

(13)

Mr. Wm. Burns P.Eng., Engineer of Construction Western Region until he retired at age seventy.

Mr. E.M.M.Hill P.Eng.,Reconnaissance Engineer succeeded Mr. Burns and in 1939 appointed Chief Engineer succeeding Mr. Dixon moved to Montreal as System Chief.

## Recall to Canadian National Railways

It was, of course, good to be home with Helena, and Eira had returned to Winnipeg to be with her Mother after John had given his life. But, readjustment was not easy and no doubt I was a bit difficult to live with.

My first assignment from Mr. Porter was to inspect some facilities in the Okanagan Valley, on the branch line southerly from Kamloops. When I entered the diner for breakfast, Major Generals Pearkes and Gagnon and Brigadier Milton Gregg were seated at a table for four and invited me to join them. After general greetings, General Pearkes, with his genial and humourous manner, said, "Well Charles, how does it feel to be a slacker?" There was laughter all around. These 'top brass' were en route to the advanced Training Centre at Vernon. The G.O.C. invited me to join them for lunch and said he would have a staff car pick me up.

The Centre was in rugged terrain about beautiful Kalamalka Lake with varied shades of deep clear water...stirring imagination. To me it was indeed a unique honour to lunch with three holders of the Victoria Cross -- Maj. Gen. Pearkes, V.C., D.S.O., M.C., Brig. Milton Gregg, V.C. and Lt. Col. Shankling, V.C.

## Steep Rock Iron Mines

Preliminary negotiations between Steep Rock and C.N.R. commenced about 1938 as mentioned in Volume I. Now development works were advancing rapidly for the mine to be in production at the earliest practicable date.

The overall scheme was one of imaginative and courageous engineering on the part of Mr. M. S. (Pop) Fotheringham. In particular, to dam the Seine River above its entry into Steep Rock Lake and excavate a diversion channel -- much of it through solid rock -- together with a control tunnel where the river would return to its natural course at the lower end of the lake, to permit it to be dewatered for open-pit mining.

The lake was very deep and underneath the water was a further depth of soft treacherous muck. Powerful suction dredges were brought in for this operation. Three massive earth dams were constructed to segregate sections of the lake. The lake bed, where ore was first exposed, was 600 feet below the water level before diversion. It was an immense man-made transformation scene.

Recall to Canadian National Railways

Canadian National's obligation was to construct railway trackage for the transportation of ore to Thunder Bay. This in no way compared with the work of mine development; however, the terrain was rugged. Mr. Fairweather, V.P. Research and Development, C.N. Montreal, turned to me when I was showing him the line as surveyed along a sheer rock face and said, offhand, "Good lord, Charles, you cannot build a railway there." It was completed on time, in relation to the mine schedule. The first train of ore pulled out with the customary spruce tree standing proudly in the leading car.[18]

Concurrently, it was Canadian National's responsibility to construct an ore dock at Thunder Bay for transfer of ore from rail transport to Great Lakes shipping. As C.N. engineers' experience on ore docks was meagre, C.D. Howe Company, consulting engineers specializing in handling bulk products, was retained to assist in the design of this structure.

Murray Fleming was assigned with me to investigate facilities for handling iron ore and recommend the type to be adopted and the building site. Mr. Cyrus Eaton, the internationally-known financier supporting the Steep Rock project, kindly invited us to Ishpiming, where he introduced us to officials engaged in transportation of iron ore and we were given a comprehensive tour of railways and facilities adjacent to Lake Superior.

It was decided to construct a pocket-type ore dock at Port Arthur waterfront. C. D. Howe Company designed this outstanding structure of reinforced concrete, the deck is 82 feet above lake level with a long viaduct approach visible from afar amongst the huge terminal grain elevators at the head of the Lakes. D. B. McKillop was C.N. resident engineer and W. H. (Pat) McIlroy was his instrumentman; subsequently both worked closely with me on other major projects and progressed within the engineering department.

The motive of a pocket dock is gravity. At the mine, ore is loaded into hopper bottom cars for delivery to the dock deck and dropped into pockets, thence through chutes to the holds of vessels

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[18] On the 'Iron Range', when a new mine is brought into production, a spruce tree is set up in the ore of the leading car of the first outward train.

(15) Steep Rock Iron Mines 'A' ore body open pit. Ore excavated by shovel was loaded into trucks for delivery to conveyor and elevated to railway loading facilities, thence by C.N. to Port Arthur. Dredge operating above 'B' body. Credit Photo Survey Corp.

below. However, Steep Rock ore was wet, sticky, red hematite, which congealed during the 125-mile run to Port Arthur, so that when the hoppers were tripped, the ore would not run unless poked with long poles from above. This was overcome by development of a specially devised mechanical shaker.

Steep Rock project was indeed interesting in that it presented a number of uncommon problems to be resolved; and opportunities for associations with renowned mining engineers, geologists and financiers was valuable experience. Mr. Fotheringham generously advised with respect to co-ordinating facilities for delivery of ore to railway cars.

When Steep Rock project was nearing to be operational, Mr. H. A. Dixon, C.N. System Chief Engineer, visited the works, February 22, 1945, accompanied by John Porter, Western Region Chief, Bill Walkden, Bridge Engineer and myself. As we were walking along an icy trail, John, a heavy man, fell, and when I moved to assist him, he said, "Les, I am hurt." A passing pick-up truck conveyed him to the mine hospital where the doctor made a preliminary examination without disturbing him too much, for, as the doctor said later, he was apprehensive of shock to an old man.

After a few hours, the doctor advised it would be safe to move John, so he was driven to Atikokan to board his business car for return by special train to Winnipeg and admittance to hospital. The pronouncement was, "a broken hip and operation without delay"; it resulted in full recovery, although Mr. Porter was two years beyond the age of normal retirement.

## Appointment to Chief Engineer, Western Region

About mid-April, Mr. W. C. Owens, General Manager, instructed me to accompany him on inspection from Winnipeg, with a side run through the Okanagan Valley, to Vancouver. The day we arrived, both the Province and the Sun carried an announcement that Mr. Porter would retire and Charles would succeed him, 1st May 1945.

Although I took pride in emulating Murray Hill, senior in reconnaissance, location and construction, and hoped to succeed him, I had never thought, in my wildest dreams, that I might be considered for Chief Engineer of the Region.

Recall to Canadian National Railways

Rumours had circulated...in fact, strange as it may appear, three weeks earlier our milk delivery man said to Helena, "I hear your husband is to get the big job," and, one day when Helena was on a bus, she overheard two men discussing the situation...so I was not entirely surprised.

Nevertheless, the announcement was somewhat of a jolt. Then a wire arrived from Mr. W. Walkden, Bridge Engineer, "Congratulations and very best wishes for every success in your new appointment Stop We are all with you." What a grand lift that gave me, especially coming from Bill, a gentleman and engineer so much senior to me.

5. WESTERN REGION ESTABLISHMENT

The Territory

As an integral part of the System, which consisted of three regions in Canada, plus the Grand Trunk and Central Vermont in the U.S.A. -- 25,000 miles -- the Western Region was by far the largest.

It extended from Current River, just east of Port Arthur, to Prince Rupert and to Vancouver, also beyond by car ferry to lines on Vancouver Island. A total of 12,500 miles of main tracks, plus ancillaries.

When the Western Region was established in 1919, Mr. Allen Fraser, the first Chief Engineer, was killed by a snow-slide at the west portal of tunnel, Mile 48 Albreda Subdivision, near Redpass Jct. Others of the group escaped injury, among them Mr. H. A. Dixon, district engineer, who was appointed Chief with headquarters at Winnipeg, where he was at the helm for twenty years.

Howard Dixon had the rare combination of qualities, a natural gentleman with advanced academic learning and wide practical experience; in short, an outstanding leader with the ability to obtain loyalty and the utmost from his staff, by concern for the advancement and welfare of each individual. He molded an efficient organization with a high degree of team spirit which Murray Hill, John Porter and I were so fortunate to inherit, for one year, six years and thirteen years respectively; it was a grand team to captain.[19]

Engineer's Responsibility

The Chief Engineer was responsible to the Vice-President and his deputy, the General Manager, for the entire maintenance -- tracks, bridges, tunnels, station and other buildings, water and fuel stations, signals, docks and wharves; also, reconnaissance, location and construction of new lines and facilities. I realized that this would be a great responsibility for me; particularly

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[19] When Mr. Dixon moved to Montreal as System Chief Engineer in 1939, Murray succeeded him, but, sad to relate, Murray died of cancer within one year, at age 58. He was a friend to all.

considering that my background had been mostly on location and construction, with but meagre association with the operating departments -- train schedules, freight and passenger traffic, express, telegraph, accounting and budgeting within the Region and its relationship to the entire System.

The Team

Bob Ross, engineer of maintenance of way, was responsible for all track work and negotiations with the relative Labour Unions. He was assisted by Ernie Johnston, a specialist in steel rails.

Bill Walkden, bridge engineer, with his highly efficient staff of design engineers and field force, ensured the safety of all bridges, also turntables, tunnels, rock and snow sheds, wharves and docks; and the design and supervision of construction of betterments and new structures.[20]

Bob Taylor, with architectural staff and inspectors, maintained offices, stations, freight sheds, engine houses, stores and car repair shops, coal docks and fuel oil services, also ice houses for storage of natural ice, and development of mechanical plants.

'L. A.' Guthrie, signal engineer, in addition to maintenance of common signals, was directly involved in the design and installation of the rapidly expanding signal system in relation to Centralized Traffic Control.

Tom Wilson, office engineer, with an excellent staff of draftsmen, produced meticulous drawings and reports, especially as required with respect to regulations of the Board of Transport.

George Clark, engineer of water supply, was in constant search for water of quality suitable for production of steam; this was particularly difficult within the Prairies.

Cliff Hooey, chief clerk, managed the general staff of accountants, clerks and stenographers smoothly; they were predominantly

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[20]Every endeavour was being made, relative to the financial situation, to replace timber with steel and concrete; the number of timber bridges had a total length of 52 miles on the Region.

male, although Cliff had a few pretty girls to brighten up the office. He was an ardent follower of the ponies and was part-owner of one.

Emerson Morse, assistant engineer, was responsible for gathering statistical reports for the basis of preparing monthly and annual budgets, with but one clerk-steno. Emerson had extensive experience both in the field and office; his wholehearted support to me in the functions I had much to learn about was invaluable.

And too, I was blessed with an excellent secretary, Vern Parr, who was always at hand in the office, and during inspection trips he travelled with me in the business car. Such trips sometimes extended to one month, so we were appreciative of the appetizing meals and service so kindly given to us by Cecil Spicer, steward. Nothing appeared to be too much trouble to him, no matter how many I might invite onto the car for a meal or perhaps for a week or two. Cecil was a cultured host and, as a hobby, a talented artist. Vern, Cecil and I, now all retired, continue a close friendship.[21]

There were four districts...Manitoba, including Ontario west of Port Arthur, Saskatchewan, Alberta and British Columbia... each operated by a General Superintendent, with a district engineer responsible for M. of W., B. & B., Signals, etc. District Engineers Neil Waddell, P. C. Perry, T. H. White and Sam Morrison, reported jointly to the General Superintendent and the Chief Engineer on general administration and engineering respectively. Neil, P.C., Tom and Sam had developed progressively on location, construction and maintenance. They could contend with any emergency and gave me, a younger man, the utmost support.

Districts were composed of divisions, under command of a Superintendent responsible to the respective General Superintendents. There were seventeen divisions, each with a Division Engineer responsible jointly to the Superintendent and District Engineer, for the direction of Bridge and Building Masters, Road Masters and Signal Maintainers, together with their forces.

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[21] When Cliff Hooey retired in 1958, Vern Parr was promoted and was succeeded by Phil Eger, another fine fellow and friend.

This was an efficient chain of command, from the Regional Chief Engineer through the above-mentioned officers to the actual working forces in the field -- totalling some 5,000 men. Further, the Regional Chief reported on engineering matters to the System Chief, Mr. H. A. Dixon, highly respected, from the Atlantic to the Pacific. It was his prerogative to recommend to the Board of Directors the appointment of a Regional Chief, but this, of course, was subject to prior support of the Vice-President with whom the candidate would have frequent personal contacts.

At the time of my appointment, Mr. W. R. Devenish was Vice-President. He was a striking personality, an upper-class Irish gentleman, who emigrated in his teens to Canada to be employed, in a very junior capacity, into the engineering department of the Inter-Colonial Railway (Government) and, subsequently, progressed in the operating department of Canadian National.

In those days, executive offices were spacious and impressive, with a huge highly-polished, flat-top table and an appropriate leather chair behind it, together with lesser chairs in front... a man's businesslike assembly.

On entering Mr. Devenish's office, one would be ill-advised to take a chair until invited to do so. Some considered him to be too autocratic but to me, accustomed to Army protocol, it was not irksome; one knew exactly where one stood.

When accompanying Mr. Devenish in his business car, as I often did, he was a gracious host but there was no relaxation on such inspection trips. He would spring provocative questions ... once going through the ruggedly beautiful valleys between Atikokan and Port Arthur, Mr. Devenish quizzed me, "Charles, what river is this? Being well-versed with the geography, I replied, positively, "The Shebandowan, Sir." This brought forth, "It has always been the Kam to me and it is going to stay so." The Shebandowan is a tributary to the Kaministiquia. On the other hand, Mr. Devenish had a wealth of general knowledge; I especially enjoyed his informative stories with historical background of Ireland.

An occasion I well remember, which made a lasting impression, is, when asked about some matter I prefaced my reply with, "I assume"; the Vice-President looked directly at me and said, "Mr. Charles, I never assume anything." However, at the end of the year, he wrote to me, in part, "I wish to thank you for your loyal support

during the year 1945 and your successful handling of the many problems that have arisen in your department during the year just past.

"We will have many things to face in 1946, different in a measure from our problems during the war years, but calling for that exercise of judgment and common sense to effect satisfactory disposal of them, and which you have already displayed during your tenure of office as Chief Engineer."

Such thoughtfulness gave me encouragement and confidence. I deeply appreciated it. Again, at the next year-end, he wrote, "The year 1946 has been a particularly difficult one for the handling of your department due to all the problems which arose, and of which I am fully aware. From our present view, it would look as if your problems for 1947 will be even more extreme, but you can rest assured whatever problems we have to solve together that I have the fullest confidence in your judgment."

Mr. W. Walkden, bridge engineer, developed a highly efficient staff for all matters pertaining to design, construction and maintenance within the Region under his direction at Winnipeg, so when he retired shortly after I became Chief, everything continued smoothly. Bill, looking ahead, had trained all of his staff to be prepared for higher responsibility. Harry Rimmington, senior assistant, automatically took command and the others stepped up respectively. Mr. Devenish paid Bill Walkden a very sincere compliment by asking me, "How is the Bridge department functioning?" I was happy to reply, "It is carrying on with the same efficiency." The Vice-President said, "That is well, I never lost a minute's sleep about the bridges when Mr. Walkden was head of the department."

Other senior engineers were approaching retirement age, 65. Mr. S. Morrison, district engineer of the most demanding territory, British Columbia, from the summit of Yellowhead Pass just west of Jasper, through the Rockies and Coast Ranges to Vancouver and to Prince Rupert, and also Vancouver Island. Sam had been there on location, construction and maintenance; a real 'mountain man' with close knowledge of the many treacherous trouble areas -- rock slides, snow slides and washouts, etc.

To appoint a successor to this vital position was a very serious responsibility for me within the first month of my tenure. There were two obvious candidates -- Mr. St. John Munroe, divison engineer, Vancouver Island, and Mr. M. Churchill, division engineer, Kamloops -- both well qualified with long experience in the mountains. They,

together with Sam, had grown up under the tutelage of Mr. Dixon. St. John appeared to me to have a little edge over Murray and I knew St. John would be accepted by Mr. W. T. Moodie, general superintendent. Therefore, I recommended St. John for approval of the Regional General Manager and Vice-President and ratification by the System Chief Engineer and Board of Directors. This became effective 1st August 1945; St. John was a solid support to me and he was respected by all, through fair and foul times, to his retirement.

Mr. W. T. White, district engineer, Alberta, with long experience dating from the early McKenzie-Mann era, also soon achieved age 65. My recommendation was Herb Roblin, division engineer, Regina. Herb graduated at the University of Toronto, then enlisted with the Royal Canadian Engineers. It was at the Training Centre of Crowborough,Sussex, that we first met. Herb had an excellent service record -- promoted in the field to Captain and awarded the Military Cross.

However, the general superintendent, Mr. F. H. Keefe, at Edmonton, did not see eye to eye with me; but we worked this out and, over the years of working together, Frank gained profound respect for Herb, as man and engineer; all three of us developed close friendship.

The dinner at Edmonton in honour of Tom White, retiring, was momentous. Among the many attending were two former chief engineers, Howard Dixon and John Porter, also the current incumbent; it was a grand testimonial to Tom, 28th November 1946.

## Recruiting Staff

During the war years, 1914 - 1919, many engineers of Canadian Northern, Grank Trunk Pacific, Hudson Bay and other relative railways, volunteered and were granted leave to serve in the Armed Forces; some were not so fortunate as to return. Very little new blood was injected into the Engineering organizations, now integrated into the Canadian National. Consequently, the Regional Chiefs were authorized to take on a number of young engineers for training in preparation for expected expansion, following World War II.

I interviewed a number of applicants recently demobilized from the Navy, Army and Air Force and who had enrolled in university

courses for Veterans. Of the many engineers to enter Engineering Western Region, all but one have developed into first-class officers; four have attained the rank of vice-president, one of whom, Jack Spicer, ex R.C.A.F., was initiated into the Railway on a survey party in the mountains; he is now quite close to the top of the ladder at System H.Q.

For a number of years, the market continued to be favourable to young engineers. Each spring, representatives of the major employers interviewed the classes about to graduate. The demand was so strong that canvassing commenced in early January and candidates were given lavish hospitality to visit respective engineering plants. I personally visited the University of Manitoba and District Engineers, respectively, called at the Universities at Saskatoon, Edmonton and Vancouver. What a contrast to the 'Dirty Thirties' when graduates who were able to obtain any employment whatsoever were lucky; others went to relief camps or drifted -- riding the rods -- back and forth across the country.

## 6. BUDGETS AND CO-OPERATIVES

Although I had prepared many estimates of costs for construction of new lines, budgeting for maintenance of way and structures and for betterments was an entirely new experience for me. Traffic must be kept moving without delays and hazards to safety, supervisors, particularly foremen on bridge repairs, have to accept much greater responsibility, working within precise time limits between the passage of trains, than their fellows on construction. These factors definitely affect costs. I approached my first meeting, hoping for the best! Fortunately, I had strong support with Emerson Morse and his years of experience at my elbow; and I knew enough to emulate the proverbial owl ... "the less he said, the more he heard."

### Monthly Budgets

The heads of all departments -- the general superintendents of transportation, motive power and car equipment, managers of freight traffic, passenger traffic, express, telegraph, the chief engineer and regional auditor, also general superintendents whose district duties would permit them to journey to Winnipeg -- were summoned by the Vice-President or, in his absence, the General Manager, to discuss in detail the results, expenditures and revenues of the previous month, plus accumulations to date for the current year and forecasts for the month ahead and to the year's end.

This brought us face to face around the long table ... a team working together for the well-being of the Region, an integral part of the System. Each member became knowledgeable of the others' responsibilities and the value of coordination. We were proud of belonging; there was strong 'esprit de corps'.

Forecast of revenues on the Western Region and, for that matter the System too, were strongly affected by reports from agriculturalists, elevator companies, the grain exchange and transportation companies about crop conditions and prospects for harvest. The railways gathered information direct from their station agents. There was an amusing incident when reports were being phoned from stations near Winnipeg, the agent at Woodridge broke in with his French accent, "I 'ave a very fine crop blueberries and jackpine" ... there was little else about there.

If reports indicated an overall poor crop, expenditures were immediately curtailed. During my early years as chief, most of the main lines, Winnipeg to Vancouver and to Prince Rupert, were of

eighty-pound rail; replacement of ties and ballast had been to a bare minimum during the War years. The Yale Subdivision through the Fraser Canyon was in dire need of improvement. The district engineer, division engineer, the roadmaster and I were inspecting it. The work of an extra gang had our particular attention when the timekeeper looked out from his office car and shouted for me to take a message from Winnipeg, relayed through the despatcher. The current budget, small as it was, must be cut. We had to continue with existing conditions until the financial outlook improved.

Every tie was closely examined to ensure that it had no further safe life before being removed. This required good judgment to ensure there would be a required number of ties with sufficient strength within each respective rail length to hold the gauge and safely support traffic.

On a branch line in the southern prairies, I asked a section foreman whether he had received any ballast. He replied, without a smile, "Yes, but the turkeys ate it all."

Of course, we grumbled when our visions for improvements had to be deferred, if not 'shot to hell'. However, it was sound business not to spend more than would be supported by revenues; better than adding to the burden of debt and heavy interest charges. One Sunday when driving me around Mount Royal, Montreal, passing the magnificent homes of financial tycoons, Mr. Dixon remarked, "These fellows draw tribute from afar."

## Annual Budgets

Throughout each year, all concerned would be motivated with desire for betterments, in addition to regular maintenance. Division engineers prepared items for the following year, in relation to long-term programs, to be scrutinized by the superintendents. These lists were submitted to the district engineers and general superintendents as a basis for the annual budget for each district, to be discussed with the Regional Chief Engineer during a series of conferences in his office each fall.

Authority for expenditure, A.F.E., was always difficult to come by. St. John Munroe, district engineer, B.C., and I met at Jasper to discuss his budget. It included an item for fencing a section of the Tete Jaune Subdivision through Hargrave's ranch. Money was

really tight and although this was a comparatively small item, I suggested cutting it out, reasoning that if a train struck a pack-horse wandering on the track, it would be more economical to re-imburse the owner than meet the interest on the capital sum for fencing.

The following day we walked part of the subdivision to examine track conditions. Foliage was gorgeous in fall colours with not a cloud in the sky. Mt. Robson stood out with sunlight on its majestic glacier, the summit, usually shrouded, was clear. As we came opposite the ranch, Mrs. Hargrave, whom we knew well, came out and invited us to tea in her large living room with picture window framing the peak, 12,973 feet -- highest of the Canadian Rockies. Our genial host queried, "Do you know the function of a guide? He leads puffing hunters and, keeping well ahead of them, spies a comfortable log for a smoke but, when his client catches up, the guide immediately hits the trail again." Tom Hargrave, relaxing in a corner, perked up with, "That's the only way to keep them moving."

Mrs. Hargrave accompanied us to the right-of-way and emphasized the subject of fencing. "You know, I have some very valuable palaminos." St. John turned to me with a wry smile, "How does that affect your economics?"

All items, tracks, bridges, buildings, yards, signals and communications, were delved into and those which could stand up on their potential merits were documented for conference with the General Manager and Vice-President; ones which survived the wringer formed the regional budget for presentation to the system committee at Montreal.

When Mr. Walter Owens was general manager, he headed the Western Region delegation, consisting mostly of the chief engineer and his supporting staff -- engineer of maintenance of way, track, bridges, buildings and signals, also Emerson Morse and secretary -- a concerted team to confront the 'powers' at the spacious old headquarters, 360 McGill St.

The board-room was impressively large with high ceiling, heavy drapes by the tall windows, magnificent oil paintings of scenes along the Grand Trunk Pacific railway between Red Pass Junction and Prince Rupert, (one painting especially attracted me ... the confluence of the Bulkley and Skeena rivers, with an Indian and dug-out canoe on a

(16) *In the Winnipeg Board Room, a Union-Management Co-Operative Meeting of the nineteen fifties:-Front row left to right C. Olson, C. Smith, F. Donovan, F. Keefe, W. Aspinal, J.L.C. (chairman), B. Chappell, J. Conrad and D. Worby.*

sand-bar in the foreground). The massive highly-polished table which we were seated around was a veritable symbol of authority.

Although Barton Wheelwright, System Chief Engineer (after Mr. Dixon retired) was chairman, Mr. S. W. Fairweather, Vice-President, Research and Development, was the overall power, a brilliant engineer and economist. It was said that he daily read and retained something of value.

When contentious items were presented, 'S.W.' would subject us to an academic discourse, sometimes of such length that Walter would explode with forceful 'caboose language'. Nevertheless, the conferences were always informative -- I gleaned much from them -- and the Railway's coffer was well guarded.

When an item was brought up for discussion, Mr. Fairweather would dramatically reach under the table to figuratively pull out a drawer and exclaim, "What is the jingle in the cash box."

Naturally in Montreal we had some relaxation during the evenings. Harry Rimmington, Emerson Morse and I enjoyed a coloured show near Windsor Station ... how those girls could sing and dance!

## Co-operatives; Management and Unions

Some other visits to Montreal were to attend the annual System Management-Union Co-operative conferences. Although some person might belabour a minor point to a tiresome degree, these discussions permitted everyone to say his piece and were always beneficial; they covered matters from the Atlantic to the Pacific, also to the North.

My attitude, I believe, was aptly described in a letter from Charlie Smith, Vice-President, B. of M. of W. E. to Ben Chappell, Chief Engineer, at the time of my retirement as System Consultant; he wrote, in part, "My first personal contact with him (Charles) was subsequent to his appointment as Chief Engineer, Western Region and I think he will forgive me for saying that, initially, we had the impression that he was rather impatient with the activities of the Brotherhood of Maintenance of Way Employees and felt that we were to some extent obstructionists.

"However, under the influence of the Union-Management Co-operative Movement and his efficient chairmanship of the Regional Committee, this

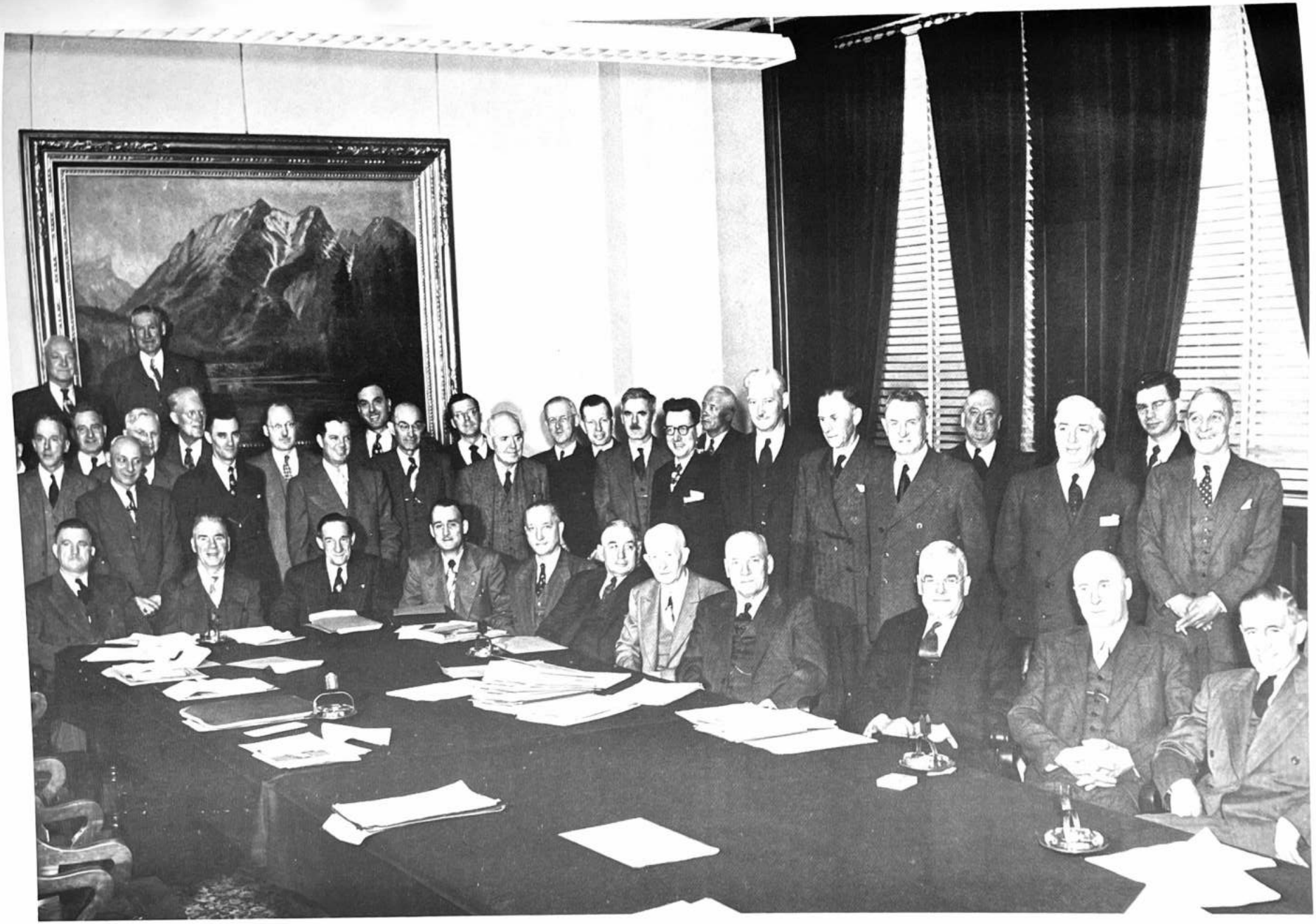
feeling was quickly dissipated and the excellent labour-management relationship that now exists resulted.

"His keen interest in training and developing the right man for the right job was to a great degree responsible for the success of our Maintenance of Way Training program, which was proved of such value to all employees.

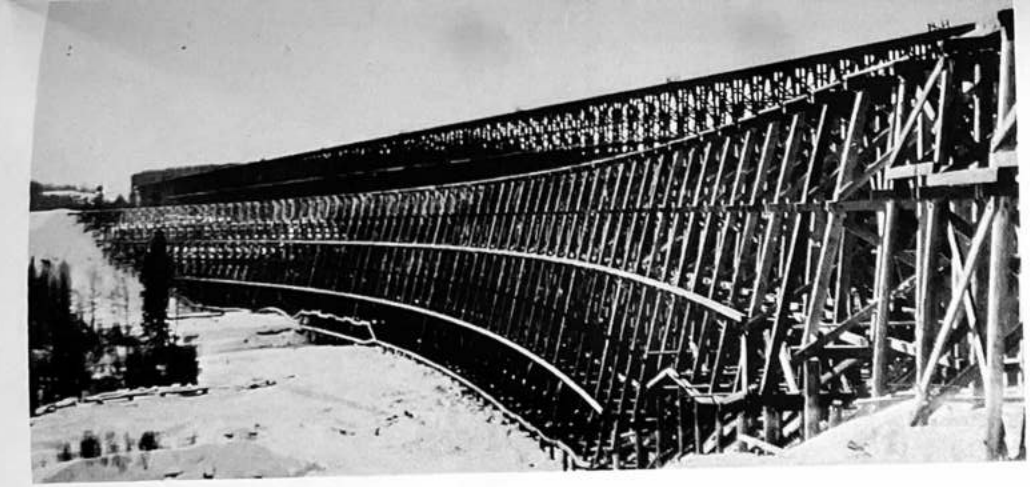
"His love of the outdoors is well known; it must be admitted that one usually received a cool reception when visiting his office, but the fact that the windows were wide open, even at 30 below zero, left little inclination for the amenities, and decisions were quickly reached.

"We, in the Maintenance of Way department, will always appreciate his understanding of the difficulties and hardships endured by the Track and Bridge and Building forces in the hottest days of summer or the coldest days of winter; he knew by personal experience and was always ready to assist in any way possible."

I deeply appreciated Mr. Smith's summary of our efforts together to improve working conditions and to increase productivity.



(17) Union-Management Co-Operative Meeting in the 'Grand' Board Room at 360 McGill St., Montreal. Barton Wheelwright, System Chief Engineer, Chairman, seated third from the right. J.L.C. standing directly in rear of Mr. Wheelwright. C.N. Photo.

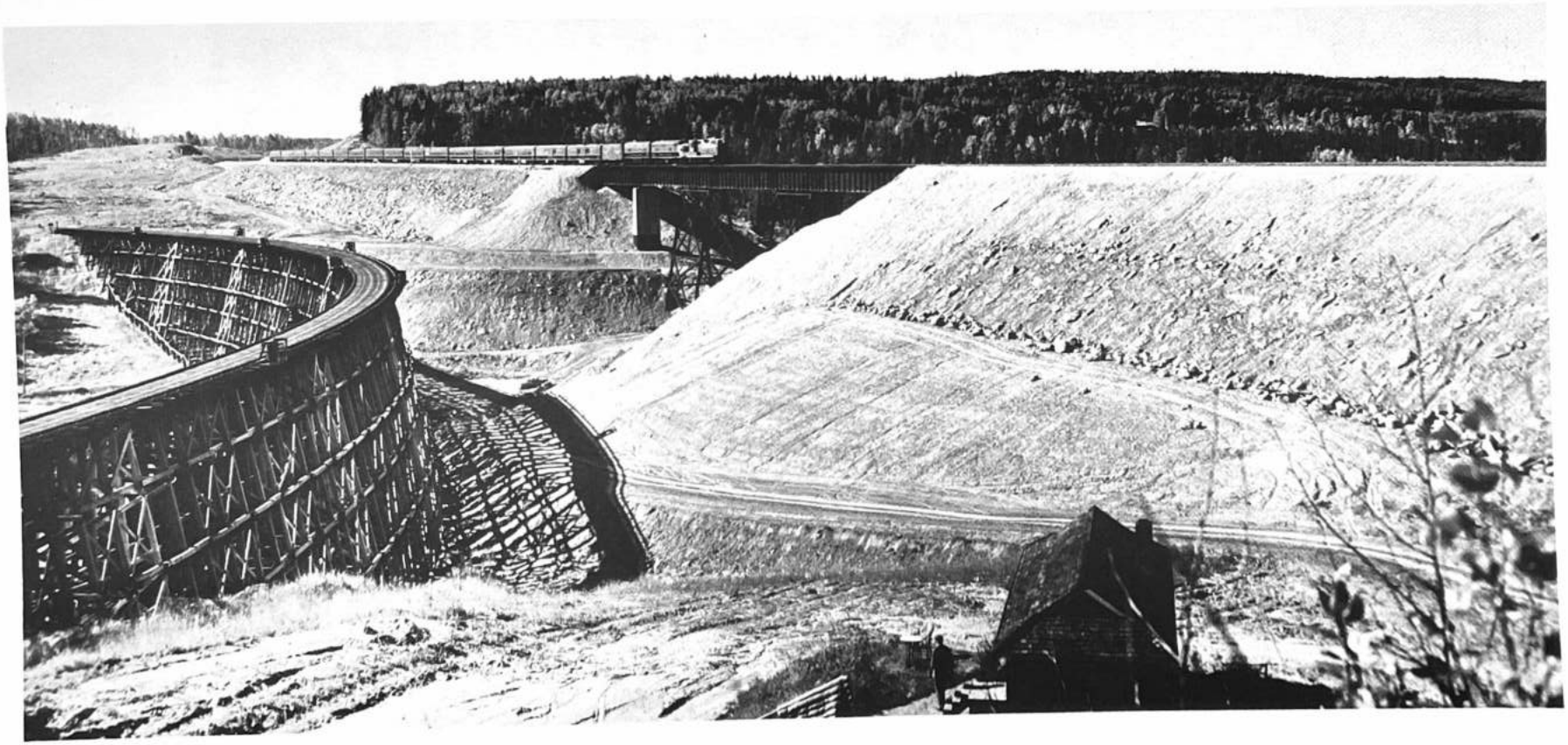


(18)

Saga of Sundance Creek five miles west of Edson, Alberta, photo at left shows the original bridge constructed during 1911 and the replacement 1923.

Lower photo, the timber bridge of 1923 ultimately replaced with a steel viaduct at the same elevation as the original structure to restore the ruling rate of gradient 0.40 percent compensated.

(19)



## 7. NEVER A DULL MOMENT

The year 1947 opened with heavy snow-falls -- the advent of four years with many land, rock and snow-slides and floods throughout the Western Region. Whole sections of track and some vital structures were washed out and vast areas of countryside were inundated. Many emergency situations had to be contended with, decisions had to be made on the spot without hesitation, to effect repairs for resumption of traffic within minimum time. To me, and to staunch supports,[22] it was a life of action with no restraining ties ... open the lines ... let the reckoning come.

### Southern Saskatchewan 1947

Communities were isolated from sources of vital supplies when blizzards struck, gale-force winds piled snow, together with soil from summer fallow, into railway and highway cuttings. On January 16, 1947 it was decided to prepare to move the rotary plow, based at Jasper, to the Prairies.

Early in February all lines in much of Saskatchewan became impassable, including C.N., Winnipeg to Regina; therefore on the 6th I went by the C.P. 'crack train' but it was held through the 7th and 8th until Sunday morning, the 9th, when the line was cleared to permit arrival at 14:00k.

After discussing the situation with Messrs. Sparling, Healy, Perry, Lucas and McKillop, I looked over the North Yard and went out with a plow extra on the Craik Subdivision to Lumsden and return to Regina.

On the morning of the 10th, I arranged with Mr. J. MacLean, Traffic Manager, T.C.A., to obtain a 'moth' plane from the Flying Club and he piloted me over the Qu'Appelle Subdivision where the rotary plow was stalled at Victoria Plains and then beyond to a derailed wedge plow extra. We landed to inspect the situation, then returned to the North Yard and again to view progress on the Craik Subdivision.

On the following day, I made reconnaissance in the Moth over the Lewvan Subdivision to Talmage, then to Weyburn and return to

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[22] It was a truly co-operative organization; however, I cannot resist mentioning three officers in particular, St. John Munroe, Joe Conrad and Bill Woodcock.

Talmage to continue over the Lewvan Subdivision to Lampman where I landed for briefing by B. & B. Master Bryce and Roadmaster Christie; then proceeded over the Bienfait Subdivision to Estevan, landed for gas, continued via the Lampman Subdivision to Radville, the Avonlea Subdivision to Moose Jaw and by the Central Butte Subdivision to return to Regina. This gave a rapid overall appreciation of conditions.

On February 12th, the gargantuan rotary plow, belching smoke and sparks over the Prairies, broke clear of the long drift at Mile 90.5 Qu'Appelle Subdivision and proceeded northerly to the derailed wedge plow at Mile 80, so that an auxiliary could be despatched to rerail the equipment there and repair track damage. It was then returned to Regina to open the Central Butte Subdivision to Moose Jaw.

On the 14th, Messrs. Sparling, Healy, Lucas, McKillop and I had a conference to formulate further programs.

With the Moth on the 15th I took off from Regina to view conditions in the south-west -- Avonlea and Gravelbourg Subdivisions. At Gravelbourg we landed and called on Mayor Bonneau to assure him that every effort was being exerted to deliver badly-needed supplies to his town. Mr. McLean and I proceeded to Swift Current for gas, to return via the Main Centre and Central Butte Subdivisions.

After briefing divisional officers, I departed by train for Winnipeg and arrived Sunday morning, the 16th, concluding ten days of exciting memorable experiences ... the first time aircraft was utilized in aid of railway maintenance of way on the Prairies.

Within two weeks, however, troubles broke out farther afield, in British Columbia and Ontario; as noted in my diary ... Sunday, 4th May -- "Went to office in morning to see reports re washout, Mile 96, Ashcroft Sub; slides, Mile 55, Albreda Sub and 11.9, Tete Jaune and derailment, Mile 89, Kashabowie Sub."

## A Typical Inspection

Spring was the season for commencement of major maintenance and betterment programs; time to inspect the mainline between Winnipeg and Vancouver, also lines on Vancouver Island and in the Okanagan Valley. In business car 73, on train No. 11, May 16,

1947, I set out accompanied by Helena and with guests Jack Ellis, Engineer of Track, Montreal and Jim Millar, President, Western Construction Co. During the station stop at Saskatoon, General Superintendent Thompson and District Engineer Perry called in to discuss matters pertaining to Saskatchewan.

On our arrival at Edmonton, we set out for the night and District Engineer Roblin of Alberta joined us to work westerly, by track motor car, accompanied by the respective division engineers and roadmasters, over one or two subdivisions daily. In this manner we could stop to view particular works and discuss them with the foreman on the job. The business car would be moved forward for overnight accommodation.

At Jasper, the B.C. District Engineer, St. John Munroe, took over. After seeing the condition of the station, roundhouse and other facilities, also calling on Major Wood, Superintendent of the Park, we proceeded through the Yellowhead Pass and along the north shore of Moose Lake -- avalanches thundered down the opposite mountains -- to the tunnel and adjacent timber snow-sheds at Mile 48, Albreda Subdivision, slated for replacement in concrete.

Seven miles ahead, a definite path of rock slides, down the precipitous mountain slope, crosses the mainline and the line to Prince Rupert, into the Fraser River. How to protect against this hazard was a quandry. The rock was not competent for tunnelling to be advisable and not stable for foundation of an orthodox concrete rock shed. It appeared that a simple wall of mass concrete at minimum clearance from the inner rail, together with electric wires extending over the track, which if struck by falling rock would break circuit and activate adjacent signals to display red, to warn approaching locomotive engineers to stop, might solve the problem. This has proved effective.

Many derailments, some with fatal results, have occurred on the Ashcroft Subdivision approaching Lytton, where the mainline is adjacent to the Thompson River, at the toe of steep slopes. Fragmented rock frequently falls. This condition was protected against by tunnels, also rock sheds of timber; we were planning extensive improvements ... replace the old timber rock sheds with concrete and construct additional ones, also install electric slide detector fences to function in connection with automatic signals. This involved, together with St. John Munroe and Joe Conrad, much investigation of the precipitous topography and of

foundation conditions.

Car 73 was set out at Boston Bar to provide convenient accommodation during our work thereabouts. The unique twin bridges, C.N. from north to south and C.P. immediately underneath from south to north, cross the Fraser River at Cisco, a few miles east of the 'Bar'. Both railways and the Trans-Canada Highway are confined within the Gorge at Hell's Gate where the famed fish ladder permits adult salmon upstream to spawning grounds and the fry to make their way to the sea in their phenomenal life cycle.

On the face of Jackass mountain, high above the track, a great rock -- known as the 'Crab' -- appears to teeter about to fall with disastrous result onto the railway. Oldtimers shake their heads and with concealed amusement point this out to give newcomers reason to worry. Some look up in awe and say it should be removed. My philosophy was ... leave well enough alone! If it does fall by natural causes, it will be an 'act of God'; whereas, if man interferes and our mainline be seriously obstructed, the 'powers-that-be' might justifiably question, "What dang fool initiated that?" Thirty-five years have elapsed, the Crab is resting in place and probably will continue to do so -- who knows?

Daylight at the end of the last tunnel by Yale gives a feeling of bursting out into the wide fertile valley by Hope and Chilliwack, through to the Pacific Ocean.

We arrived at Vancouver 23rd May, inspected railway properties and had conferences with General Superintendent Allen and other operating officers. In the evening, Helena and I drove around Stanley Park, ablaze with masses of flowers; the weather, too, was perfect. We were having dinner at Prospect Point overlooking First Narrows when a C.P. ship, packed with excursionists -- at the bow a Scottish band piped and drummed with much vigor -- sailed through the First Narrows en route to Victoria ... so exhilarating to behold and recall Sir Walter Scott's memorable lines,

> Breathes there a man, with soul so dead,
> Who never to himself has said,
> This is my own, my native land.[23]

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[23]Walter Scott, "The Lay of the Last Minstrel," The Poetical Work of Sir Walter Scott (London: George Routledge, 1866), iv, 1.

Never a Dull Moment

At noon, 24th May, we boarded the S.S. "Chelohsin" for a sail to Butte Inlet and other local ports, returning next evening to Vancouver just in time to transfer to the regular C.P. ship sailing at midnight for Victoria. Sunshine, moonlight, spectacular scenery, merry environment and excellent shipboard service made this a delightful Victoria Day excursion.

We walked the short distance from the dock to the Empress Hotel where Helena would stay for two days. St. John Munroe and Ross Wilkinson joined us for breakfast, in the luxurious but dignified dining room. Then we left to inspect the railway yard at Point Ellice and docks at Ogden Point and proceed over the Tidewater and Cowichan Subdivisions; also look over the ferry slip and dock at Cowichan Bay before tieing up at the hotel in Duncan.[24]

Next day we continued by track motor car to Kissinger, the end of C.N. lines on the Island; then returned to Victoria. Although the overall length of these tracks is comparatively short, they traverse very rugged terrain and present a number of significant engineering features -- high timber bridges of individual designs, docks and ferry slips -- which required experienced personnel to maintain, especially when budgets were trimmed to bare minimum.

It was late evening when I called at the Empress for Helena to board the overnight boat for Vancouver and bid Ross adieu. It was a beautiful passage between the Gulf Islands, especially through Active Pass. Service was excellent with comfortable staterooms and good meals available, so much more enjoyable than the present rushes on the Provincial Ferries.

A day at Vancouver provided me with more time to review our railway and marine facilities there and at Port Mann. Brigadier Wyman, Industrial Agent, drove me to see properties on Lulu Island.

Vern Parr had Car 73 lined up at the rear end of train No. 2 on the evening of May 28th, and Cecil Spicer had everything shipshape, for Kamloops. In the meantime, Vern had graciously assisted Helena shopping; they accused me of scheduling to be in towns on

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[24] Ross was locating engineer during the two winters on surveys to Churchill. His final years of service were as division engineer, Vancouver Island; he died at Victoria, age about 70 years.

early closing days so that they would be unable to spend.

With St. John along, we had a smooth run to the Kamloops Junction and transfer to Kelowna for a base during inspection of railway and relative tug and barge facilities in the Okanagan Valley.

Murray Churchill, Division Engineer, and Roadmaster Gunderson had a motor car in readiness to take us over the Okanagan and Lumby Subdivisions. Next day, we motored along the lakeshore highway to Penticton and Naramata and return, passing masses of beautiful flowers in gardens and orchards, giving promise of bountiful crops in season and for substantial railway express business.

During the return to Kamloops, Murray took us to a lookout to view the kaleidoscopic colouring of Kalamalka Lake ... almost unbelievable beauty. It was with regret that we had to leave this veritable paradise, southern B.C. between the Coast Ranges and the Rockies, and return towards the Prairies.

At Jasper St. John left us and Herb Roblin took over again. Easterly from this mountain resort the gradient descends so smoothly, speeding away from mountain fastnesses, and saying adieu to the 'Brule Cat' always gave me a twinge of sadness, for I love the mountains -- slides, washouts and all. The challenges they present will be eternal. The forces of nature never rest, whereas man now works but eight hours, five days weekly and some, in the name of progress, propose even more leisure ... I wonder!

We set out overnight at Edmonton and next morning, Sunday 1st June, inspected foundations being poured for the new east wing of the station. After lunch, Herb, together with the Asst. Supt. and Roadmaster, piloted me in motor car 59 to Wainwright, with intermediate stops at Kinsella ballast pit and the major steel viaduct crossing Battle River.

Early next morning we continued to Biggar, where Supt. Crawford, District Engineer Perry and Roadmaster Valde were on hand with motor car 55 for inspection of the Asquith Subdivision to Watrous. There we re-boarded business car 73 in readiness to be switched onto train No. 12 for Winnipeg, to end eighteen days of delightfully informative activity.

## Never a Dull Moment

Secretary, Vern Parr, and Steward, Cecil Spicer, gave me so much thoughtful assistance. Routine matters and correspondence were promptly attended to en route; and excellent meals were served, frequently at irregular hours; breakfasts at daybreak and dinners late in the evening. Unexpected guests were graciously welcomed. Also, these fine fellows were so kind to Helena, especially when I was out on track motor cars; fresh-cut flowers brightened the lounge and dining room. All were so co-operative and friendly.

I inspected the mainline Armstrong to Vancouver, also other important track such as the south line, Port Arthur to Winnipeg, Winnipeg via Dauphin and North Battleford to Edmonton, Regina to Saskatoon and the north line, Red Pass Junction to Prince Rupert, during all seasons each year; and all branch lines throughout the Region at least once in two years. I enjoyed it immensely.

Some readers may question, why depict all of this? It is an endeavour to portray the day-to-day demands on the forces engaged on maintenance of way and structures and the decisions they had to make on the spot without hesitation; also, the close association between senior officers and other ranks. From my observations, the B. & B. foremen and section foremen, together with their respective men, were indeed dedicated, loyal employees -- fine weather and foul.

## President's Special

During periodical inspections by "Specials", nearly all officers and many other employees were given opportunities to meet the President and/or the Executive Vice-President in person. Regional Vice-Presidents, together with their respective Chief Engineers and one or two other Seniors, were called upon to accompany the President's retinue. It behoved one to have the answers!

One memorable journey, 27th Sept. to 13th Oct., 1947, was with Mr. R. C. Vaughan, President, and Mr. N. B. Walton, Executive Vice-President, from Port Arthur to Vancouver and Victoria, with many intermediate stops to call on Provincial, City and other dignitaries and to inspect important railway betterments and other works in progress. One was at Hell's Gate, to walk down to the fish ladder and view protection to our track. At Victoria, the C.N. S.S. "Prince

George" was launched 6th October.[25]

To accompany Mr. Walton was valuable experience. In the lounge of his business car he would sit on the left side of the door looking to the rear and observe everything. I would be sitting on the opposite side. Mr. Walton was not a talkative person unless he queried some precise point; but, one could not fail to learn about railroading from him for he had been through much, especially as a despatcher. To me, despatching, particularly in the era before installation of automatic signals, power switches and push-button panels, was the very heart of a railway; some men broke under the strain of making split-second decisions to keep traffic moving without delays.

Mrs. Walton usually accompanied her husband; in contrast, she was inclined to be of ample figure and bubbled with exuberance ... indeed a kind, generous couple.

## Slides and Floods, 1948

Heavy snow-falls in the Foothills and mountains indicated difficult conditions might occur. We, the bridge engineer and district engineers, reviewed the available work equipment, snow-plows, bulldozers, power shovels, pile drivers and trucks; also, stocks of bridge materials -- piling and timber.

At my office Sunday morning, 15th February, I picked up a wire advising of a derailment on account of a snow-slide at Mile 53, Albreda Subdivision, west of Jasper.

On 23rd February, a freight approaching Lytton, engine No. 2765, ran into rocks at the west portal of tunnel, Mile 91.4, Ashcroft Subdivision, slid into the edge of the Thompson River and came to a stop in an extremely precarious position. The line was quickly repaired for traffic. However, it was recognized by all concerned that engine 2765 was in such a dangerous position that extreme caution would be essential in any effort to salvage it. St. John Munroe, Joe Conrad, Supt. of Motive Power Charlie

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[25]Her retirement was scheduled for the end of 1975, but it was hastened by fire when preparations were being made for the Alaska Cruise season; many will miss the gracious service.

Stewart, the division wrecking foreman and I conferred at the site. Careful preparatory work was essential before the badly-damaged locomotive could be raised and moved to the shops at Port Mann.

We were all saddened by the death of Mr. Wm. Burns, retired Engineer of Construction, 27th March, who was so profoundly respected. He was very thoughtful and kind to me.

And, another marked event took place during this time of stress... Vice-President W. R. Devenish retired; a dinner was held in his honour at the Fort Garry Hotel, 31st March, and he was succeeded by Mr. J. P. Johnson. Two more diverse characters could hardly be envisioned ... the former, a son of an aristocratic but impoverished Irish family, emigrated as a young man to Canada to enter service with the Inter-Colonial Railway. J. P. progressed the despatchers' seniority list, to become a brilliant railroader, but not so cultured; one of his quips was, "B.S. is okay if you can make it stick on a tile roof." I got along with both and thank them for their consideration towards me.

I invited retired Bridge Engineer W. Walkden to be guest with me to view snow conditions on the Albreda Subdivision near Red Pass Junction. Late in the evening, 21st April, train No. 3 was held by two slides, Mile 53.1 and 53.5, until released by the rotary plow from Jasper. When the conductor was checking his passengers before whistling off, he discovered an old man, travelling to the Senior Citizens' Home at Kamloops, was missing. It was feared that he had wandered from the train in the dark, on the narrow path along the shoulder of the embankment above the almost vertical drop to the turbulent Fraser River. We were relieved, however, to discover that the old fellow had not fallen, but found him sitting in a track patrolman's bunkhouse. Conductors have many responsibilities.

At Boston Bar, wired advice came that the high water situation in Alberta and Western Saskatchewan was rapidly becoming disastrous, so I returned easterly to confer with General Superintendent Keefe and District Engineer Roblin at Edmonton and chartered a light plane to leave at 7:30k Sunday, 25th April, to make a quick overall appreciation,firstly towards North Battleford. Zero visibility forced us to land in a stubble field at Vermillion to wait until it cleared.

Two high embankments near Mile 6 Blackfoot Subdivision were completely washed out. Two local contractors, H. W. Stuart & Son, and Ferguson Construction Co., put on equipment for immediate repairs.

## Never a Dull Moment

Then advice came that the main line, Unity Subdivision, Mile 52 to 56, was completely inundated, so I flew there and spotted a location to excavate a diversion channel and organized forces at Unity. As Bill Walkden was at Edmonton, I returned there to seek his advice for the most rapid method to drive piles to support temporary track for trains of gravel to be pushed out for unloading and restoration of the lost embankment. Bill quickly gave me a design for two rows of piles onto which stringers would be laid to carry the two ribbons of rails.

Pile drivers and materials were moved -- one from Saskatoon and one from Edmonton -- to the ends of the job and were soon hammering away around the clock; concurrently, shovels were loading cars with sand and gravel to rebuild the embankment.

The forces of water were rampaging over the Calgary Division. Frank Keefe, Herb Roblin and I left Edmonton at 6:00k, 29th April, in motor car 59 and, en route, came to a wash-out at Mile 51.4, Stettler Subdivision. Herb stayed to organize repairs there while Frank and I continued to Calgary, thence easterly on the Drumheller Subdivision and found Serviceberry Creek and the Rosebud flowing in such volume and causing so much destruction that it was hard to comprehend. Several high embankments approaching bridges were carried away and some long sections of rails and ties hung in mid-air. Together with the B. & B. Master, we moved heavy grading equipment, pile drivers and bridge timber to restore this track, known as the "Goose Lake Line" between Saskatoon and Calgary.

Good progress was being made so I returned to Winnipeg, 5th May and after attending to office matters went to Steep Rock Iron Mines at Atikokan, then on to Port Arthur to see operations on the ore dock loading 'lakers'. May 16th, a wire advised that run-off from the Riding Mountains was endangering track on the Dauphin Division in Manitoba. However, problems at many locations on the Prairies were but preliminaries to the main bout to come in the mountains.

## Disaster in British Columbia

Heavy snow, late run-off, together with rain, gave warning to expect extremely high water levels in most rivers flowing towards the Pacific -- notably the Fraser and Skeena -- so equipment and materials were assembled at tactical points.

Never a Dull Moment

The first blow hit 25th May. A dam on Heffley Creek, above Mile 128, Clearwater Subdivision, just east of Kamloops, failed and torrents carried a long section of railway roadway into the Thompson River. After arranging initial moves by phone with officers at Vancouver, I left for Edmonton. Frank Keefe and Herb Roblin had motor car 59 standing by, so I was able to go through Jasper and on to Red Pass Junction by 21:30k and leave next morning, Sunday, 30th May, at 4:00k to continue, through Blue River, as far as Boulder; but ahead, submerged track stopped further progress with car 59. It was then by boat to Barriere where Division Engineer Churchill was waiting with a truck to proceed to Kamloops.

The despatcher on duty handed me a message stating that the Thompson and Fraser Rivers were rising rapidly, threatening the mainline to Vancouver and that, in the north, the Skeena River was ravaging the line to Prince Rupert. So, it appeared that Kamloops would be the most convenient point to establish temporary headquarters for the battle. I wired for Vern Parr to come with business car 73 as quickly as it became possible to move forward.

Bridge, Mile 28.8, Ashcroft Subdivision, west of Kamloops, was taking a violent battering; pier 4 was settling and water level was rising upstream. The piers were having the effect of a dam, nothing could be done to relieve the pressure. Observing this, I chartered a light plane to make a quick appreciation of conditions through to Vancouver and, together with General Superintendent Cooper and District Engineer Munroe, planned forces for combat.

I invited Cooper to fly with me to view the river and track while returning to Kamloops, but he declined. Munroe, however, joined me much against his inclination, but he was a good sport and, when flying quite low, turbulence through Hell's Gate gave the effect of a bucking bronco, St. John said, "We should put a saddle and bridle on this damned thing!"

It was high time to see what the Upper Fraser, Bulkley and Skeena Rivers were doing to the north line, Red Pass Junction to Prince Rupert, so 1st June I flew from Kamloops directly to Prince George and next day landed at Smithers to confer with Chief Despatcher Dunn, then went on, flying just above the telegraph line, to Prince Rupert and met Superintendent Berner, Division Engineer Davidson and Roadmaster Trestain to advise them of my observations and general program for repair work.

Never a Dull Moment

I left Prince Rupert at 19:00k taking Bob Davidson with me to Woodcock and stayed overnight with a farmer, Mr. Little. In the morning, we went by track motor car to Mile 75.7, Bulkley Subdivision, to inspect a wash-out there. A long section of track together with a number of box cars were carried into and down the Skeena River for some distance; many of the rails and ties were never found to be salvaged from the swirling current.

We planned a line revision, 2600 ft. long with cut up to 50 ft. deep, for temporary operation. Pat McIlroy, Assistant Engineer, surveyed this and was delegated to take charge, together with Dave McNaughton, Superintendent of Work Equipment, to keep the machines moving. Other extensive damage, not far away, was at Tatlow.

General Superintendent Keefe and Assistant Engineer Staffansson were at Prince George, so I took them with me, passing Mt. Robson, to Red Pass Jct. We landed on Moose Lake with surrounding mountains reflected in its mirror like surface of burnished gold and red ... a scene to deeply impress all but the dullest of persons.

At first daylight, with low mist in the valley, Ruben Staffansson took me in his small track motor down the "Tete Jaune Hill" to see what progress was being made with a power shovel clearing a mud slide at Mile 10.1. During the return, upgrade, the telegraph lineman came around a curve and rammed into us; Ruben and I jumped clear as did the lineman, without injury, but the cars were damaged. As the line was impassable to traffic, the lineman, scanning the wires along side, had not expected to meet anything; we mutually agreed to make no accident report so the matter closed on the spot.

After breakfast at Red Pass Junction, we took off in the "Seabee" for Kamloops to meet System Bridge Engineer R. O. Stewart and his inspector, Hamilton, from Montreal, also Bridge Engineer H. S. Rimmington from Winnipeg, to make a joint inspection of endangered bridge across the Thompson River, Mile 28.8 westerly; water level was continuing to rise and increase in velocity. Harry remained to assist me but the others left to return to the East. The same evening, I took off again in the light amphibious aircraft to land on a narrow emergency strip on the mountainside above Boston Bar and meet St. John.

Next morning, on foot, we examined the track and were alarmed that the Fraser had risen so high; it was flowing through one tunnel, normally high above the river, and depositing drift logs in it -- a scary situation -- St. John and I had one thought, "Let's get to hell

(20)

British Columbia Floods 1948, box cars were washed from the main track into the Skeena River near Woodcock. Photo J.L.C.

out of here." We then flew low into Vancouver and requested Navy personnel to take us by boat over the vast flooded valley about Matsqui, where five miles of mainline was completely inundated, so deep that we sailed over fences and were almost level with telegraph wires.

F. W. Woodcock, Supt. of Work Equipment, Winnipeg, came to take charge of maintaining the great concentration of machines; there was no better man than Bill, he thrived on challenges.

Sunday, 6th June, I returned easterly by air -- with stops at Hope and Boston Bar for conferences with Superintendent George Glay, St. John Munroe, Joe Conrad and B. & B. Master Page -- to Kamloops and was delighted with a wire that Helena would arrive next evening from Winnipeg, as it appeared I would be working in B.C. for some time. I drove her out to Echo Lodge at Paul Lake, a beautiful resort high above the city, but there were few pauses in the pressure of work to permit me to visit there. Helena, however, enjoyed it very much climbing about the hills and one day proudly showed me an exquisite nest and tiny eggs of a humming bird and a magnificent stallion which ranged about there. Lena also had fun boating and jollying with fishermen about their catches.

## Bridge, Mile 28.8, Ashcroft Subdivision

Destruction of steel bridge, Mile 28.8, caused the most serious disruption to traffic between Kamloops and Vancouver, It was horrible, like watching a mortally-wounded person die. We called in George Knight, a renowned diver, from Victoria, to examine the foundations of piers in the river but the velocity, 9 miles per hour, caused it to be impossible. On July 1st, rails were removed and the telegraph department took off its wires just before pier 4 collapsed and the adjacent spans dropped into the river. The current was so powerful that the heavy mass of steel was carried about fifteen hundred feet downstream.

That this disaster would occur had been evident for three weeks, so plans had been made to drive a temporary pile bridge. We had conferences with F. C. O'Connor, retired Bridge Construction Superintendent residing in Kamloops, about methods, particularly how piles might be held in vertical position against the violent current. This extremely dangerous work -- piles whipped about with little support until finally braced -- was accomplished under the joint direction of B. & B. Master Page and P. Engr. Alex Pepper. Unfortunately, one young worker was

drowned.

Although pier 5 had moved 8 inches, it appeared that it might be anchored for sufficient time to permit span 6 to be salvaged for re-erection and reduce the amount of new steel required for restoration of the permanent structure. I contacted H. H. Minshall, Dominion Bridge Company Manager for B. C. We met at the site; he had driven through the night from Vancouver. After we discussed the situation, I asked Harry for an approximate estimate to salvage span 6. Without hesitation, he said, "Give me fifteen minutes." Leaning on the hood of his car, he commenced to calculate and gave me a figure which I accepted there and then. Harry turned to his foreman who accompanied him, saying, "it's your job." It was obviously dangerous, the foreman replied,"You had better get another man. I suppose you will buzz off." But Harry replied, "No! I will support you." A real officer.[26]

The temporary pile bridge carried traffic until a new steel structure was designed, fabricated and erected on time, 6:45k, 8th March, in advance of spring high water, 1949.

## Protection Against Future Onslaughts

The preceding paragraphs give brief accounts of some of the points of destruction, however, there were many more. The City of Vancouver was isolated except by aircraft; C.N., C.P. and G.N., also highways, were all impassable for about two weeks.

After restoring C.N. for traffic, St. John Munroe and I prepared a program to strengthen the railway against future periods of high water, etc. Barney Allen, Manager, and Jack Cooper, General Superintendent, B. C. District, wished to defer this, but I felt that if we stopped raising low embankments, riprapping relative works, it would be doubtful whether we would be able to reassemble the heavy equipment, manpower and funds. Howard Sparling, General Manager, supported my proposals, so we were able to continue improvements until our line was much stronger than before the floods. The forces on maintenance-of-way and structures, of course, co-operated wholeheartedly; they were grand fellows.

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[26] H. H. Minshall served in World War II, subsequently Lt. Col. commanding the Royal Canadian Engineers Reserves at Vancouver.

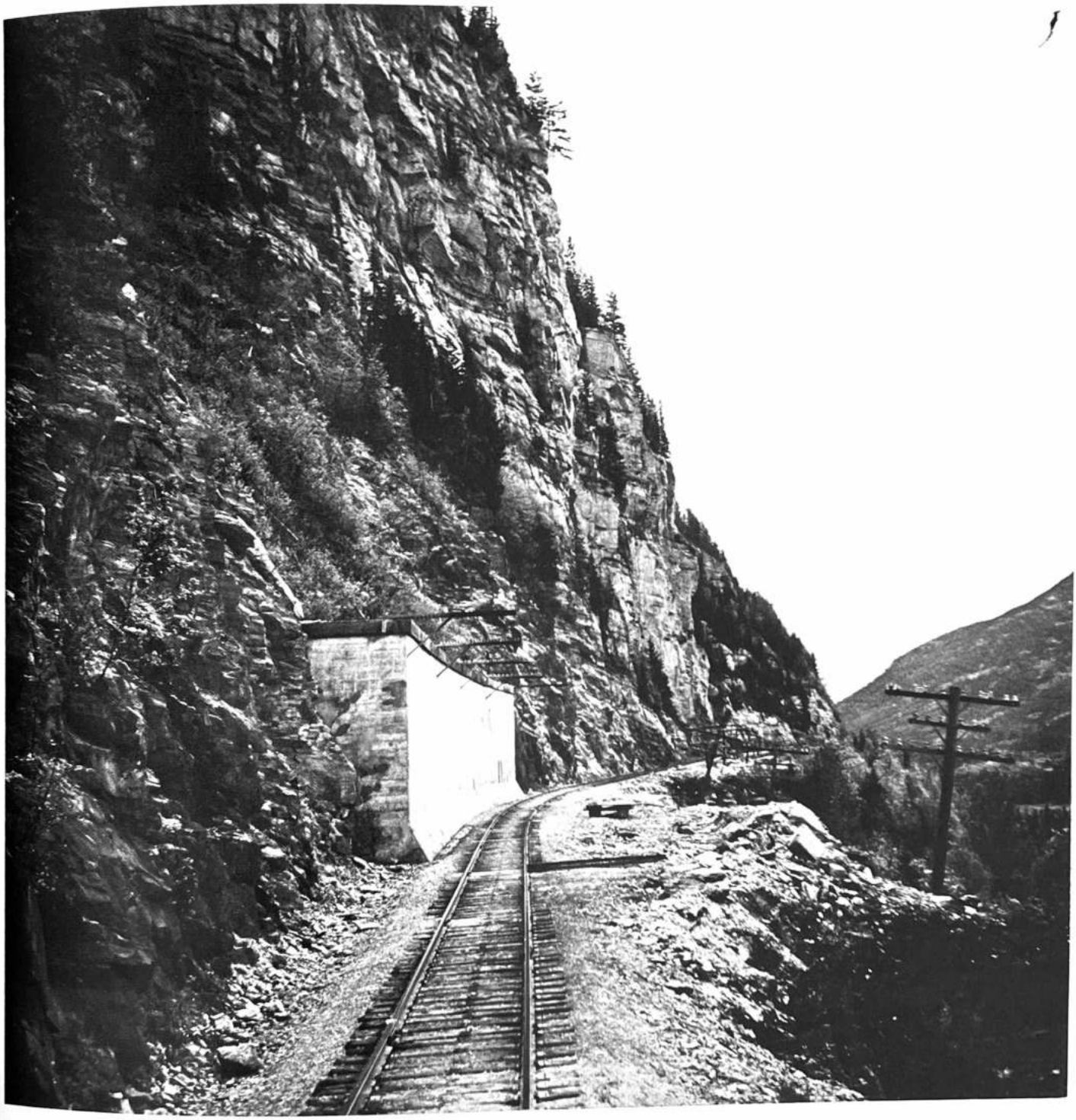
(21) Bridge Mile 28.8 Ashcroft Sub. across the Thompson River west of Kamloops destroyed by spring high water 1948. Temporary timber trestle was erected to carry traffic during time required to design, fabricate and erect a new steel bridge, before high water the following spring.

(22) Volunteer workers take a coffee break during Winnipeg Flood, 1950, study by J.L.C.

(23)

C.N. Main Line through the Fraser Gorge blocked by heavy snow slides has been cleared, then without warning more slides struck, work continued around the clock. F.H. Keefe, Gen. Supt. and the Chief Engineer there.

C.N.R. main line alongside the Thompson River approaching Lytton, B.C.; showing tunnels and rock sheds. During 1949/50 slide director fences were erected the first installation on C.N. lines.



(25) Unique protection against rock slides - massive concrete wall with overhead electric detector fence - mile 55.6 Albreda Sub., 1950; there is no sound foundation on the lower side for construction of a normal type rock shed. Turbulent flow of the Fraser River strikes hard against the toe of this precipitous mountain face.

Never a Dull Moment

On July 17th, Barton Wheelwright, Ross Stewart and Harry Rimmington came from the East to meet me at Red Pass Junction. After inspecting Intrusion Prepakt's work lining tunnel, Mile 48.1, I took them to Hargrave Bros.' ranch for lunch. Looking from the dining room, there was a stupendous view of Mt. Robson in all its glory, with sunshine striking the massif of ice and snow.

I returned with Barton as far as Winnipeg, after being away from my office for nearly three months of interesting and rewarding activity; making decisions involving extremely heavy expenditures without being questioned. Each evening, I sent a comprehensive wire to the Vice-President; he acknowledged but once, thanking me for the progress being made; I indeed appreciated the confidence this indicated.

Towards the end of August, Herb Till, Assistant to the Vice-President, and I prepared an overall report with many photographs for submission to System H.Q., Montreal; and, during the fall, I made further extensive inspections of the works in progress to bolster main tracks through the mountains; they were continued, and automatic block signals and slide detector fences were installed through 1949.

Mr. Gonder, General Manager - Introduction to the North Line

Our departure from Winnipeg for Prince Rupert was on a bright summer evening, 29th June. At Jasper there was a stop of several hours; Mr. Gonder wished to play golf. Although I do not play, I was pleased to walk around the course, but a heavy shower soaked us. When we returned to the station, Jim Millar was sitting in his car, so I introduced the new General Manager. My light summer suit was badly wrinkled and Mr. Gonder apologized for my appearance to Jim, who replied, "I have known Charles for a long time; it's not clothes that make a man."

St. John arrived to accompany us on his district. Mr. Gonder's deportment and language were a little different from ours. A controversial subject came up during dinner and St. John expressed his views before I could kick him under the table!

We arrived at Rupert during Saturday night to awake to a lovely day. When free of rain, the deep harbour sheltered by high mountains,

is glorious. Water urges me to quest for a boat, so I pestered Superintendent Berner to dig one up; it had a rusty one-lunged engine. Al Berner, duty-bound, came with us and big, jolly Bob Davidson joined too. As Mr. Gonder was basically from the mechanical department, we suggested he should operate the engine. Many pulls of the cord produced a few revolutions to sail one hundred yards or so, then stop. Mr. Gonder repeated this time and again, with good nature and no profanity; something new to the rest of us.

A shiny launch passed by and a beautiful girl on the bow shouted, "Want a tow, Al?" Berner, I think, would have liked to have dropped me overboard for getting him into such an embarrassing situation. However, with Mr. Gonder's perseverance we got to a beach to swim and returned safely; his admirable self-control was amazing.

Monday morning we left by open track motor car. Very shortly, typical Rupert rain commenced. I pulled rain clothes from my bag and Mr. Gonder, wearing a straw hat said, "Les, you might have told me what to bring."

In response to a wire for lunch to be prepared at Longworth, all was ready when we arrived. A bottle of Scotch was on a coffee table standing on a great grizzly bear rug in front of a blazing open fireplace. St. John was a special guest here. He gave me a quizzical look. I said, "No use being a hypocrite, let's have a drink." Mr. Gonder had a ginger ale and all was well.

On the second night we tied up at Prince George. I borrowed a car and invited Mr. Gonder to drive with me to visit trapper-prospector friends at Summit Lake. As to be expected, they produced rum for old acquaintance sake! Mr. Gonder took a coke. During the return drive, however, he said, "I have never met such men, thank you for giving me the opportunity." We worked our way back to Winnipeg. I described Mr. Gonder to Helena and was told, "It will improve you to travel with him!"

## Holiday - Bella Coola and Stue

On my next trip to Vancouver, Helena accompanied me. Saturday evening, 6th August, we boarded Union S.S. "Cardena" to visit five charming settlements during a two-day voyage to Bella Coola. I was

keen to see the rock in Burke Channel where Sir Alexander Mackenzie terminated his immortal journey and inscribed, "Alexander Mackenzie from Canada, by land, 22nd July 1793." If there had been means of communication he might have met Captain Vancouver exploring the coast not far distant. Instead, hostile Indians made it advisable for Mackenzie not to delay his return overland.

When nearing the 'rock', I enquired of our Captain whether I could join him on the bridge in order to have a good view. He was hospitable and said, "Bring your wife too." Some conversation ensued about Victoria; Lena commented, "A pretty quiet place." The old salt at the wheel turned towards her and with a genial grin said, "Not if you know where to go."

At Bella Coola, we were greeted by Lt. Col. Corbold who drove us 40 miles over a trail through lofty timber to Stue, where he and his wife operated a lodge facing directly towards Mt. Stupendous -- just in time to wash up for dinner. We were the only guests. Everything was excellent and trout were abundant in the swift-flowing mountain streams. We thoroughly enjoyed our hosts and enthralling surroundings for ten days.[27]

On return to Vancouver, we transferred to the C.P. S.S."Princess Mary" for Galliano Island to join St. John and Mrs. Munroe for five more days of relaxation, walking, rowing and fishing -- grisle (sometimes termed young salmon) are delicious. The Gulf Islands were a veritable Shangri-la ... then, property was reasonable; now prices are just about prohibitive.

Return to duty was by inspection on the Island, and the mainline; arriving home 30th August to be brought up to date by Emerson Morse.

Together, Helena and I, with two business cars, hosted members of the Professional Engineers and Engineering Institute of Canada and their wives on a field day to the Manitoba Hydro plant at Pine Falls, Sunday, 18th September ... a delightful outing.

Two weeks later I was on line again, with Vice-President Johnson

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[27]Lt. Col. Corbold served with distinction during World War II in Italy and N.W. Europe. One year after our visit to his lodge, it was destroyed by fire. He returned to the Army, in command of the 2nd Bn. Princess Patricia Light Infantry in Korea.

and General Manager Sparling; first to Port Arthur to meet Mr. N. B. Walton for inspection to Winnipeg, thence via Saskatoon, Calgary and Edmonton to Vancouver and Victoria and return.

After a few days at home, Harry Rimmington and I left for The Pas and Flin Flon, then westerly to Prince Albert. Afterwards, we travelled over our line in Minnesota. At Duluth, every other store had eye-stopping displays of liquor; on being asked what we might have, the owner, a bit crusty, said, "The whole damn works if you have the price."

By then, 20th November, it was time to go to Montreal for the annual Capital Budget Conference; I had a pleasant evening as guest of Mr. Walton for dinner at the Mount Stephen Club and attended a hockey game, Canadiens versus the Maple Leafs, before returning home to again hear of heavy rains and impending land slides in B. C.

1950

The New Year opened by my leaving Winnipeg for Vancouver and Prince Rupert. Mr. Hutton of the Board of Transport Commissioners accompanied me to observe track conditions, particularly works which were being continued to strengthen the roadway subsequent to the 'Floods'; also protection against snow and rock slides by detector fences.

On my return, I was alarmed to find Helena very poorly. She brushed it off with "only flu", but it was obviously more serious. Our doctor was called in and he ordered her immediately to the Misericordia Hospital for an emergency operation, performed by Dr. Corrigan without delay, to relieve a strangled bowel -- just in time.

Early in February concurrent thaws and frosts precipitated a heavy coating of ice on the rails between Boston Bar and Vancouver. An urgent call came for ice-cutting attachments to Jordan Spreaders. Bill Woodcock found them and left on the first flight for Vancouver. Next morning, he had them in operation on the Yale Subdivision. Bill was in his element; he loved action.

After the Regional Co-op meeting, I left with Vice-President J. P. Johnson on his last inspection to the West Coast prior to

(45) Monument to Sir Alexander Mackenzie
where he made the immortal inscription,
"Alexander Mackenzie from Canada, by land, 22nd July 1793".

(46) Near Bella Coola, British Columbia.

(47) Tweedsmuir Lodge, facing Mt. Stupendous.

retirement. It was a hectic trip. We were held up by a wash-out at Mile 52.8, Yale Subdivision. Fortunately, bulldozers were handy to restore the road-bed within a few hours.

J. P. was always reluctant to turn in before midnight or later. On the boat to Victoria, he said, "We will go down to the coffee room." As we perched on the stools, George Knight, the diver, greeted me. J. P. said, "Who is he, introduce me." George had an enormous handle-bar moustache. It attracted J. P. and he made a sweeping motion of combing the great adornment, and queried, "How did you get that!" Whereupon, George made a similar sweep and replied, "If you had been in the Army as young as I, you would have that!" -- A simple but amusing incident.

A month later, Mr. J. R. McMillan took over as Vice-President.

System Maintenance of Way Union-Management Co-op meeting was set for 25th April. Union officials, Charlie Smith, Fred Donovan Olson and Clawson were on the same train, so I invited them to dinner in Car 73. In Montreal, I had my first introduction to our new President, Mr. Donald Gordon. On arrival home, I was to face real trouble, right on our own doorstep!

## The Winnipeg Flood

Heavy precipitation saturated the soil during the fall: run-off from deep winter snow could not be soaked up during the late break-up which, together with spring rains, caused the Red River and its tributaries to overflow their banks and devastate vast areas of productive agricultural lands, villages, towns and the city of Winnipeg throughout the month of May.

The last day of April, Superintendent Cunningham, Bridge Engineer Rimmington, Assistant Division Engineer Worby and I headed south by track motor car via the Letelier Subdivision to Emerson. Extensive areas, particularly about Morris, were under water for miles up to rail level, at some points above top of rail, and rising daily. It was obvious this track would soon be impassable for operation of diesel locomotives -- a depth of six or seven inches will stall them, unlike the old steamers which could run through much deeper water, up to the bottom of their fire boxes.

Miles of sand bag dykes were constructed by thousands of

volunteers assisted by personnel of the Navy, Army and Air Force, to protect the most vulnerable areas of Winnipeg, including Wildwood Park where daughter Eira, son-in-law Dr. R. F. Friesen and two young children, John and Bruce, resided. By May 5th, the Red River water was lapping at the top of the dyke there. We moved furniture, all except the piano, to the second floor, and the family evacuated. By the next night, pressure had weakened the dyke and water topped it to flood the entire subdivision up to the eaves of the houses. Army searchlights were directed on clouds above to reflect light to assist evacuees. It recalled war scenes at night.

The young family were with Helena and me until all persons who could leave the City were urged to do so. Lena went to her sister's at Toronto, Babs (Eira) and the little boys went to Rhiney's mother at Gretna. Rhiney, of course, remained. I put a cot in my office at the C.N. Station to be available at all hours and be in close contact with the despatchers. Later, I was given a room in the nearby Fort Garry Hotel. It then became necessary to build a sand-bag dyke around the station to prevent flooding of the basement and vital utilities.

C.N. line southerly is located in general parallel to, and west of, the Red River. The embankment prevented free flow from tributaries into the Red River and resulted in formation of a vast lake south of McGillivray Blvd., adjacent to the suburb of Fort Garry. As the water level rose, the height of the boulevard was increased with sand-bags. The situation became critical. If the flood breached there, it would rampage through the River Heights high-class residential area to a confluence with the Assiniboine River at Wellington Crescent and on through the hub of downtown.

To prevent such a terrific disaster, it was recognized that the railway embankment should be cut at points near the Sugar Beet factory. The Army prepared to execute this with explosives, 18th May. It was to be quite a show with press and radio in attendance.

I was fully in accord with the objective, but not with the method. During the night preceding the planned blast, Harry Rimmington, with a gang of railwaymen, and I, removed some of the rails and ties and dug trenches through the ballast and top of the embankment to start the flow of impounded water towards the Red River. The velocity of flow very quickly increased the openings and, by sunrise, the crisis was averted. When the Army personnel arrived to put on the planned

spectacular, they were somewhat miffed that it was off.

By the end of May, work was commenced to restore conditions to normal. On 2nd June, City forces employed two diesel shovels, three front-end loaders and 30 trucks to remove earthworks from Water Street and front of C.N. freight sheds.

## British Columbia, Again

A landslide, on the steep mountain slope, 20 miles easterly of Boston Bar, carried the high railway embankment down to the Fraser River, 15th June. I left Winnipeg via T.C.A. at 13:55k for Edmonton, thence by motor car 59 through Jasper and arrived at the slide the following evening. Frank Keefe and St. John Munroe had arrived from Vancouver. We decided to build a 'shoofly' -- 24 bent temporary bridge and grade approaches, with a pile driver at each end, together with bulldozers and scrapers.

I took this opportunity to visit a small engineering party surveying proposed projects to protect against rock, land and snow slides, just then working at tunnels Miles 80.2, 80.4 and 80.5, Ashcroft Subdivision, alongside the Thompson River. Frank Farish was in charge; Jack Spicer and Ron Bailey were there too. They, and other keen young engineers, joined the Engineering Department when demobbed from the Armed Forces.

## Manitoba Too

As aftermath of conditions which contributed to the 'Flood', mud slides occurred during July and August on the mainline along the side-hill of the Assiniboine River, west of Rivers, requiring extensive corrective works.

On Labour Day, C.N. dance hall at Grand Beach, reputed to have the largest and best floor in Canada, burned to the ground. It was a great loss to young Winnipeggers who could have a happy evening, by the "Moonlight" and return, for fifty cents.

These reminiscences substantiate the heading of this chapter ... "There was never a dull moment." I enjoyed them all, working with such loyal and capable fellows; and deeply appreciated Helena's acceptance of the 'oft' times lonely life of a railroader's wife.

## 8. REVIVAL OF LOCATION AND CONSTRUCTION

This rejuvenated me ... to again take part in opening up new fields. There had been none, except short spurs, for twenty years. No young engineers had training in the art of location;[28] those appearing to have the essential aptitude would have to be coached. To do this and concurrently carry on the responsibility of maintenance of the Western Region, would allow me few week-ends and holidays at home. This was alleviated, however, by authority granted to establish an assistant chief engineer. Emerson Morse was appointed, particularly to attend to office matters, budgets, etc. I could have had no better support.

Two heavy construction projects -- one in Northern Manitoba, and the other in British Columbia -- came concurrently.

### Sherridon to Lynn Lake, Manitoba

C.N. constructed a branch line during 1930 from Cranberry Portage to Sherridon, Manitoba, to serve Sherritt-Gordon Mine, basically copper, having an estimated life of twenty years. As result of continued search, a new ore body, basically nickel, was discovered at Lynn Lake. In September 1946, I was invited to assess the practicability of a railway route to the site.

The year 1951 opened with the news that Lynn Lake mine development was at the stage that Sherritt-Gordon requested C.N. to provide railway services. Consequently, President Donald Gordon called in Executive Vice-President S. F. Dingle, Vice-President of Research and Development S. W. Fairweather, System Chief Engineer Barton Wheelwright and myself for a conference at Montreal; the outcome was authority to locate a railway, approximately 150 miles, to the new mine. Mr. Fairweather emphasized financial circumstances demanded that the line be designed for cost of construction to be the very minimum. He described a logging railway he was on during his youth; I was not very happy about his concept, but inwardly resolved to locate and build to the best classifications possible with available funds.

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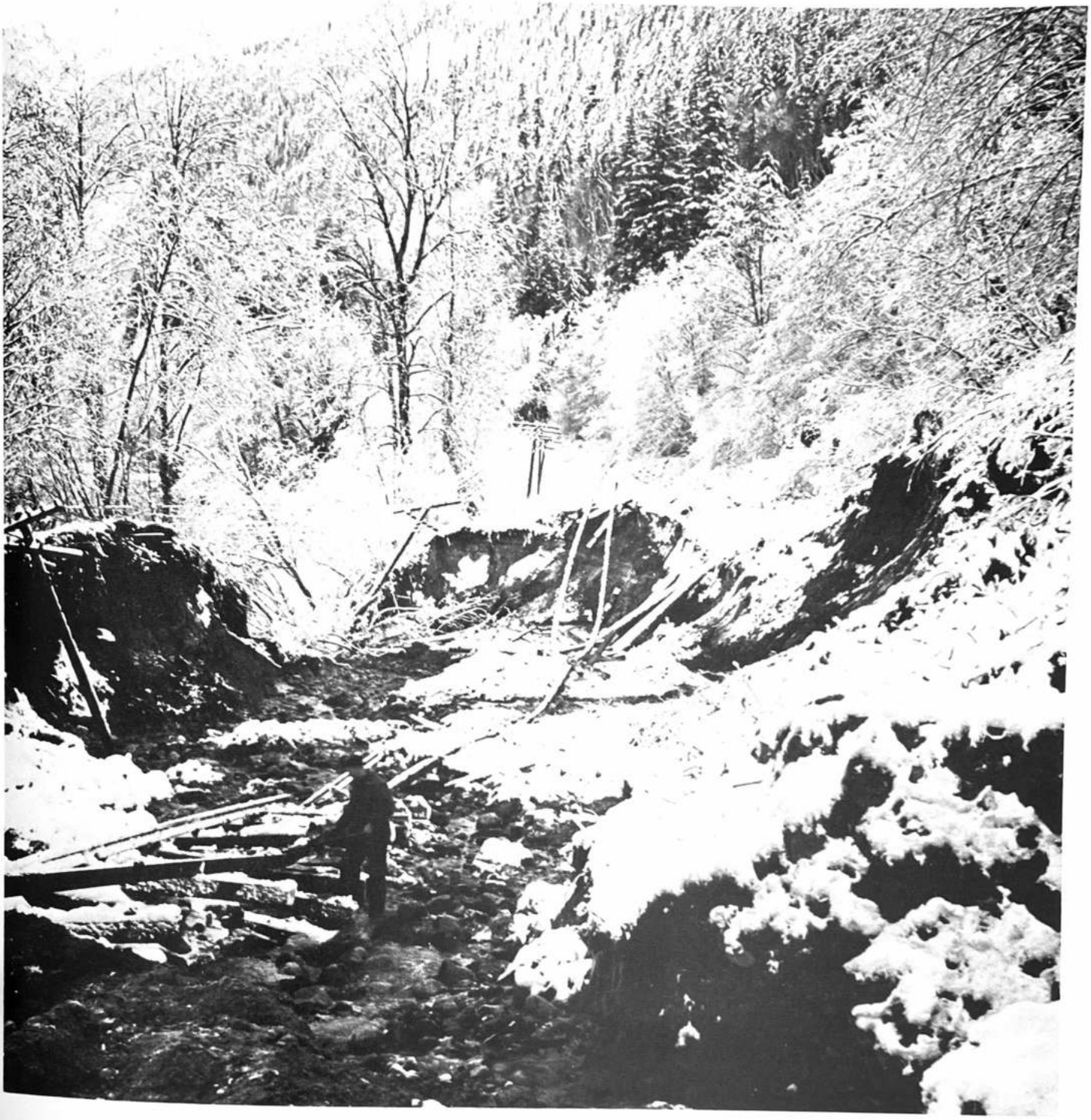
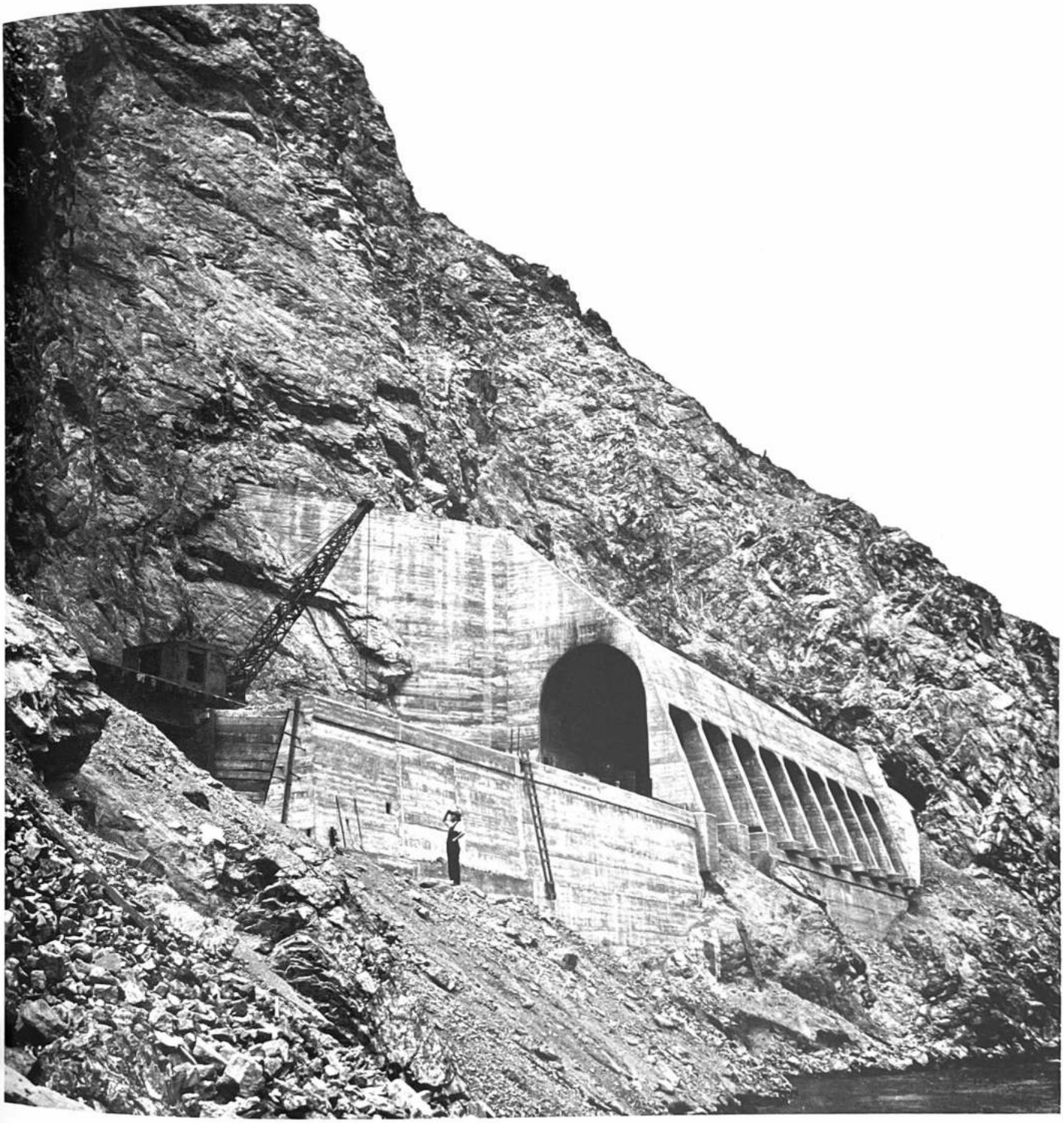
[28] Railway location has been described as an art, rather than science. Natural aptitude and urge to explore are essential. Without these attributes, some engineers, otherwise highly qualified, have failed in this special field.

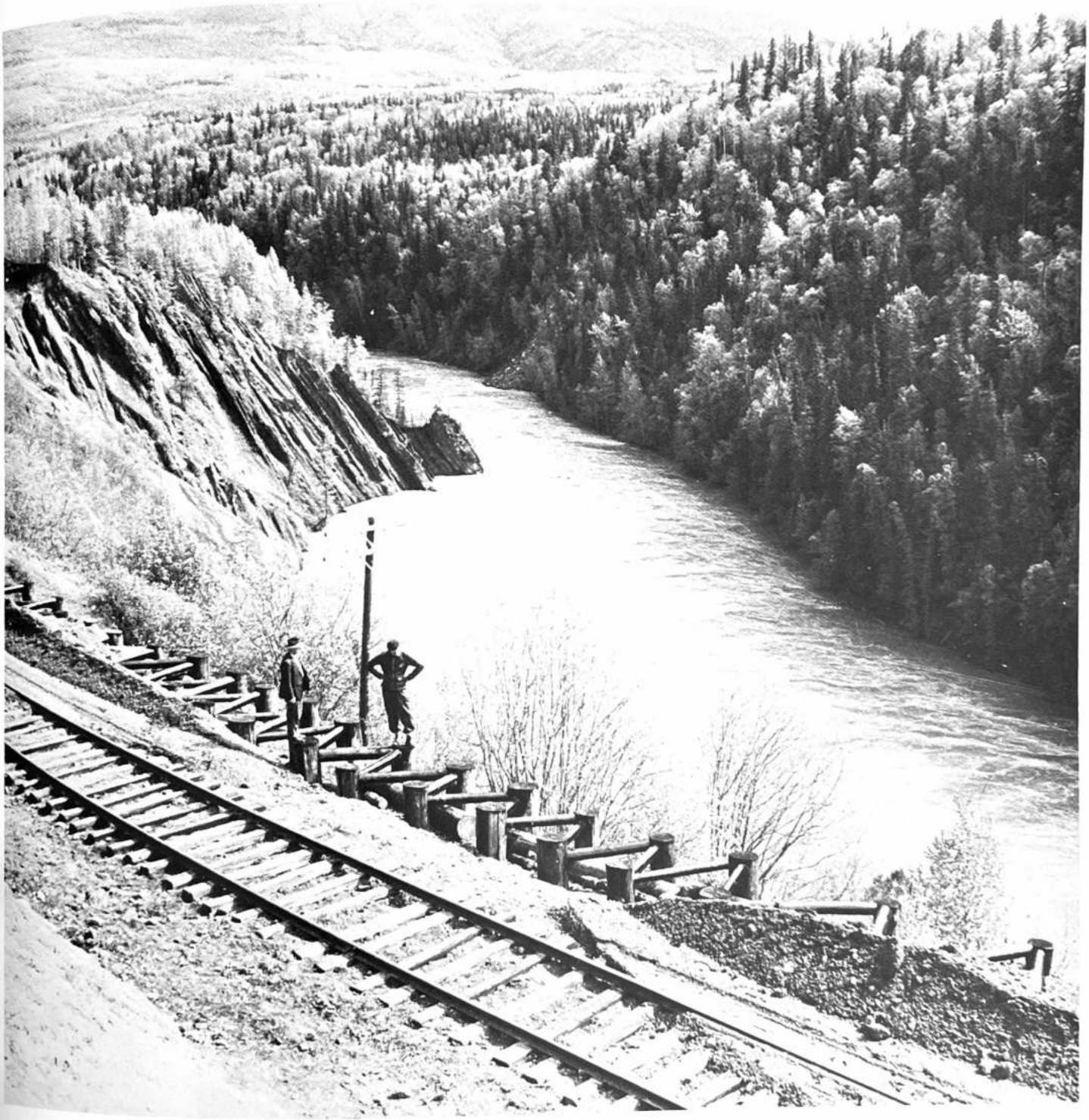


(26) Beauty and destruction - C.N.R. Main Line to Vancouver at base of Cheam Mt., Yale Sub. div. January 1951. J.L.C.


(27) C.N.R. Main Line, mile 59.3 Yale Subdivision, washout caused by logging operations, high on the mountain slope, diverting a water course. J.L.C.



28) During 1951/53 there was progressive construction of concrete rock sheds on the Ashcroft Sub. - Joe Conrad, District Engineer, inspecting.



(29) Harry Robertson, Gen. Supt. and Jack Cann, Dist. Engr. examining pile protection to embankment from erosion by the Bulkley River near Hazelton, B.C. J.L.C.

(31)

The main line carried by a landslide into the Thompson River westerly from Kamloops B.C.

(30)

Ashcroft Subdiv., steel bridge Mile 109.3 was carried by a rock slide to the Fraser River, 23rd November 1953, replaced with temporary timber.

Revival of Location and Construction

Although Joe Conrad had no specific experience in location, he was a very active fellow with sound professional training and, during the B.C. floods, had exhibited much talent to accept responsibility and get things done. I relieved him of his duties as Division Engineer at Port Arthur to conduct surveys to Lynn Lake.

We departed together from Winnipeg by C.P.A. for The Pas, 30th January, and were met by Ralph Shapland, pilot, with the mine's 'Beaver' for direct flight to Sherridon and a hearty welcome by Heath Hales, Mine Manager and C. R. Neely, District Administrator. They made us at home in the sumptuous guest house, built of huge cedar logs imported from B.C. and oak floors; in the massive open fire-place, birch logs blazed. We could not wish for more. It was the first of many stopovers with hospitable Sherritt-Gordon officers.

Ralph was ready at daybreak to fly us on reconnaissance. There were two practical routes: (1) extend the existing track northerly to cross the Churchill River at Pukatawagan Falls, thence to Lynn Lake; (2) turn off from the Hudson Bay Railway at Odhill to cross the Churchill at Granville Falls. We landed at both river crossings and at noon by Setting Lake to boil the kettle. To me there is nothing more enjoyable than to clear untarnished snow from a patch of ground, spread freshly-cut spruce boughs for a carpet to prevent moccasin-clad feet from becoming wet when snow thaws about the edge of the fire as it crackles, cut a handy log for a seat, melt snow for water -- what matter if a few rabbit droppings and spruce needles fall in, it brews invigorating tea with a smoky flavor -- and heat a pan of bacon with beans and thaw bannock for a hearty snack.[29]

Assessment of the factors which would affect construction, operation and maintenance of the two routes pointed towards extension of track northerly from Sherridon and that the location survey should be commenced at the major obstacle -- Pukatawagan Falls.

We pitched camp there for an initial party with Assistant

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[29]Pre-cooked beans laid out on a canvas sheet to freeze separately like marbles are easily carried in a bag and quickly heated together with bacon. Moose and Caribou may be laced with bacon strips into convenient small rolls and frozen; they too will thaw and cook quickly. On the trail, bannock is superior to bread for it does not crumble when thawed.

Engineer Goldstone in charge. Joe and I stayed to direct him for a few days; temperature was 57° below zero.

Joe established his base at Sherridon. On my return to Winnipeg, I approached Bob Ross to take the position of office engineer, which he accepted. It was then necessary to recruit personnel and obtain equipment -- instruments, tents, cooking utensils, supplies and Bombardiers, for two strong parties. V. R. Cox, Assistant Engineer, had located a short spur to a coal mine near Forestburg, Alberta, and H. Connor, Assistant Engineer, had run spurs to R.C.A.F. bases near Dauphin -- they were promoted to be locating engineers. The positions of transitmen, levelmen, topographers, draftsmen, rodmen, chainmen, levelmen, topographers, draftsmen, rodmen, chainmen, axemen, cooks, bull-cooks and transport drivers were filled and we were 'away to the races', 5th February.

I was diverted to B.C. for a week, because of slides and wash-outs on the face of Mt. Cheam between Pokum and Vancouver.

About mid-March, it appeared the Aluminum Company might construct a plant at Kitimat; if so, railway construction would have to be undertaken there, so again to Montreal for a conference.

Returning to the north, I was able to devote ten days in the field with the two parties surveying towards Lynn Lake. It was impractical to walk without snow-shoes ... Joe Conrad abhored them. He maintained ski would be much preferable until one day, in dense young spruce amongst large timber and dead-fall in the vicinity of Pukatawagan Falls, we had to put our heads down and push a way through the entanglement; during a breather, Joe reluctantly conceded ski would be impractical under such conditions; I compromised that in open country ski are much superior.[30]

In the first week of May another rush trip to B.C. A landslide, 650 feet long, carried C.N. mainline 50 feet down into the Thompson River. And, near Basque, C.P.R. was also in a precarious position. My counterpart, T. E. Price, requested me to meet him there to jointly examine a section where both railways were on the same (south) side of the river, where there was danger that both tracks might slide into the Thompson to cut rail trans-

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[30]Joe was born in St. Moritz; just about grew up on ski to become a highly esteemed expert by his own Swiss compatriots.

port to Vancouver. We agreed on an extensive program of riprap.[31]

Request for a railway to Kitimat became a reality. I went there immediately to make a reconnaissance for this major construction project -- not long but through rough mountain terrain -- then returned to Winnipeg office for a couple of days before going back to Sherridon.

Running an outboard engine on a boat up the main channel of the Churchill River below Pukatawagan Falls, during a heavy snow-storm, 1st June, and poor visibility, I rammed into a rock about a foot below the surface where, to my knowledge, the channel was deep without any obstruction. Joe was with me; the jar nearly threw him overboard. Fortunately, the boat was strong, otherwise we might have ended our days as it would be doubtful whether a person could survive more than a few minutes in the cold water. We landed on an island and made a fire in shelter of a large spruce tree to sit out the storm. There was no flying for three days. When the weather cleared, from over the river I spotted the rock that nearly caused our undoing; it was a 'loner'. You can bet I did not overlook it again!

Dominion Day was on a Monday, Winnipeg office closed for a long week-end. To me, this offered an opportunity to work with the survey parties. On arrival at Cox's camp, Friday evening, the normally affable fellows in the office tent were unusually quiet. The reason soon emerged. Vic, together with his senior categories, had chartered a Norseman to come from Flin Flon, about 100 miles, and transport them there to meet their wives and girl friends, respectively, for the mid-summer holiday. I WAS ABSOLUTELY FLABBERGASTED .. location parties had never taken holidays until their projects were completed! In this instance, the party had been in the field barely four months.

Wives and girl friends were already en route to Flin Flon, two from as far as Edmonton, and Grant Henderson, draftsman, showed me a glittering diamond with which he proposed to seal his engagement. The few concerned were in the higher salaried positions -- they had given no thought about the others, rodmen, chainmen, axemen and the cook; they could hang around camp with mosquitoes and black flies. The circumstance clearly called for compromise. We agreed that the

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[31] T. E. Price, Chief Engineer on C.P. Western Lines. Tom and I served together in France, 1917.

trip would go forward as planned, on the understanding that return to camp would be in time to go out to work Tuesday morning. In the meantime, Murray Robb, transitman, and I would carry on with the job.[32] Tuesday morning, however, was foggy, so the holiday group did not arrive until near noon, but it was not their fault.

By mid-July, plans, profiles and specifications for construction were sufficiently advanced for tenders to be advertised for clearing right-of-way, grading, installation of culverts and timber bridges. This job was far from sources of supply and labour; also heavy capital commitment would be required to carry it through to completion within the limited time called for, 15th October 1953, in relation to the mine's schedule for production and shipment of nickel to Sherritt-Gordon refinery at Fort Saskatchewan, Alberta.[33]

Only four contractors, Brown & Root, C. A. Pitts, Tomlinson Bros. and W. C. Wells, were interested enough to view the surveyed line. Wells did not submit a bid; Brown & Root were so high as to be immediately out of the running and Tomlinson included an unbalanced item which was not acceptable. Therefore Pitts was awarded the contract following a meeting held by Mr. Gordon at Montreal, 1st August.

St. John Munroe, B.C. District Engineer, retired; Joe Conrad was the obvious successor and Bob Ross was appointed Construction Engineer at Sherridon. Resident engineers with field staffs were set up in camps along the route, each to be responsible for staking the works on the ground, observe that they were executed to specifications and measure the unit items for payments to the contractor.

Camps consisted of tents set up on log frames by a lake or river, convenient to the centre of each residency, so that the maximum walk to work on the line would be five or six miles. Each camp was provided with a cook and first-class supplies. The majority of engineers were newly-weds so had their wives and, in some cases, young children, with them.

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[32] Why Murray, next in pay scale to Vic, was not in the party, I do not know.

[33] Construction of the steel bridges to cross the Churchill River was later awarded to the Dominion Bridge Co. Track-laying, ballasting, telegraph line, buildings and other facilities were done by C.N. forces.

(32) Sherridon to Lynn Lake - selecting bridge site for crossing the north channel of Churchill River at Pukatawagan Falls, 2nd. February 1951, temperature minus 57 degrees F.

(33) Sherridon to Lynn Lake - showing the priest and some of his parishioners at Pukatawagan Indian Reserve the route map. Photo by Ken Hand 31st August 1952.

Grant Henderson, who had given his fiancee the brilliant diamond, was one of the residents. He built a log shack and a wondrous rustic bed; but there was one unpleasant feature about his camp site ... it was black from a recent forest fire. Murray Robb's wife, a nurse, was with him until she had to leave to go to Dauphin to have a baby. And, the first child born at Lynn Lake was to the McIntyres. There were several other young couples on the job; it was fortunate for old-timer Bob Ross, and C.N. too, that they were of high calibre.[34]

Vic Cox was appointed Assistant Construction Engineer; he made his base in a comfortable log camp at a beautiful site overlooking the Churchill River, just down stream from Pukatawagan Falls. Pickerel and large jack fish were plentiful and the local Indians netted sturgeon.

President Donald Gordon took special interest in the Lynn Lake Project. Although he, of course, was a master with respect to financial matters, it was his first experience with actual railway construction; he was keen to be on hand to observe the opening.

Fall in the north is a grand season; by the end of September frost has taken the vigour from mosquitoes and black flies; the atmosphere is clear and crisp; lake trout have come up from the depths to forage near the surface. Waterfowl are preparing for their long flight to winter in the south; the haunting call of loons will be missed until spring. Our Canada geese, however, will be heard high overhead in their "V" formation with a great honker in the lead. It was into this exhilarating environment that Mr. Gordon arrived at Sherridon.

Contractor Pitts' base camp was inspected, also commencement of clearing the right-of-way for the new line. Charlie Pitts, with his engineer, Sid Cooper, and project manager, Charlie McKnight, drew special attention to two gargantuan track-mounted rock drills starting to work on the first cut to be blasted and excavated; also to the fact that there would be two helicopters on the job. It was a good show for public relations with the uninitiated.

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[34] In addition, Bill VanDeventer, Jim Skinner, Moffat, Dolphin, Staffansson, Cassidy, Mason and Hooper were resident engineers. As they completed their respective sections, they leap-frogged ahead progressively. During the initial stage, George Wardrope and Conrad Gran were loaned from the H.B.R.

Revival of Location and Construction

Mr. Gordon and party left by special train that evening for Churchill to observe port facilities and return southerly to visit Lynn Lake before freeze-up. Ralph Shapland was in readiness at Ilford, 1st October, to fly us across country to the mine. Unfavourable weather, however, delayed take-off until afternoon.[35]

I told Mr. Gordon about the exploits of a trader friend, Oliver Lindal, and suggested a visit to his store. We were cordially greeted and given two fine trout that had been brought in from an outpost at Shamattawa. Oliver walked with us to the business car and was invited in; it was about mid-morning. With Scottish hospitality, Mr. Gordon said, "Mr. Lindal, it is not quite the time to proffer a drink, but would you care for one?" Whereupon, Oliver promptly replied, "Mr. Gordon, I never pass one up." The outcome was that Oliver enjoyed luncheon with the President of the C.N.R.

In the afternoon, clouds cleared enough for Ralph to take off but again closed in, making it advisable to land at South Indian Lake. Mr. Gordon strolled about, interested in the Indian settlement and Hudson Bay Post. He stood for some time watching a native fisherman melting lead over an open fire and pouring the liquid metal into moulds for net sinkers. The weather improved in time to continue to Lynn Lake before dark. I do not think, however, that Mr. Gordon would have been too perturbed if we had been forced to stay overnight at South Indian Lake, to be able to see more of the way of life there.[36]

Lynn Lake town site is adjacent to two small lakes close to the ore bodies. Most of the buildings were hauled by tractors over the winter trail, northerly from Sherridon, a distance of 170 miles, to be set on new foundations. The spirit of the 'North' prevailed to quickly consolidate the very pleasant new town with amenities and social facilities.

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[35]The party ... President Donald Gordon, Executive Vice-President Stan Dingle, Western Region V. P. Reg. McMillan, Mr. Daly of the Board of Directors and J.L.C.

[36]South Indian Lake was a very entrancing widening of the Churchill River and now, in 1975, Manitoba Hydro plans to dam the river down stream to raise the lake level, in spite of strong opposition from native trappers and fishermen, also others interested in preserving natural ecology.

(34)

En route from Ilford to Lynn Lake, 1st October 1951, weather forced a landing at South Indian Lake; Mr. Donald Gordon, President C.N.R. was interested in an Indian moulding lead sinkers for fish nets. (J.L.C. Photo)

(35)

Cox, daughter Elizabeth and Bob Ross, J.L.C. in rear, on Van Hende Lake.

A tour down to the 1600-foot level gave us an insight to the mine. There was a little delay finding a miner's outfit large enough for Mr. Gordon. After lunch we took off for an aerial view of the railway route -- landed at Pukatawagan Falls for a close look at the site to cross the Churchill River -- through to Sherridon and entrain for Winnipeg.

The crossing of the Churchill is a short distance down from the Falls where the river is divided by rock islands into three channels which could be bridged by comparatively short spans at less cost and time than one long structure. The origin of these three bridges was unique ... Dominion Bridge Company received a contract from 'White' China to supply several steel bridges, which were fabricated and erected for test, then disassembled with each member numbered ready for shipment. The political circumstances, however, deteriorated and the spans were held at Lachine.

This was a real find for C.N.; three through-truss spans were just the lengths required to cross the Churchill. They were consigned by train to Sherridon and forwarded by winter trail to be ready for erection immediately the concrete substructures would be completed during the summer of 1952. This was the key to opening rail transport to fulfil C.N.'s obligation to Sherritt-Gordon. Other factors with respect to both time and cost were, of course, the features controlling the location to obtain the shortest practical length of railway with minimum quantities of grading, culverts, bridges and track laying, etc.

The maximum rate of gradient was set at 1.75 per cent compensated and rate of curve not to exceed 10 degrees, with one exception ... a 15-degree curve around a high rock bluff, to avoid an expensive tunnel on the south approach to the Churchill River. Grading materials were predominantly clay, rock and muskeg with some permafrost which was excavated in successive layers as they thawed when exposed.

However, the location was established so that gradients and alignment could be improved under traffic, if tonnage increased in the future. The class of rail was 60-lb. second-hand, and ties were untreated to keep initial capital expenditure to a minimum. If this policy had not been adopted, construction of the railway might not have been viable and Lynn Lake mine and town may not have developed at that time. It was a practical example of, "Cut the cloth to fit the garment."

Revival of Location and Construction

During July, Mr. R. O. Stewart, System Chief Engineer, came from Montreal to view progress. There was a near tragic incident, accompanied by some amusement. It was arranged that Charlie McKnight would meet us at Mile 27. He arrived safely by helicopter; but, as the pilot took off, with Murray Robb and his black Labrador retriever as passengers, the undercarriage was caught by an exposed root of a tree stump, causing the tip of the main rotor to tilt and strike the ground. Pieces of rotor and chunks of soil flew in all directions. First out was the frantic large dog; with one leap he streaked away without a backward glance. Fortunately there were no personal injuries but it was the end of the helicopters; and the two monster rock drills, so vaunted by Pitts during the opening display at Sherridon, were also quietly shelved as not suitable for this project.

About the same time, another serious accident occurred. A cat skinner sallied out to shoot a bear scavenging near Pitts' magazine. The bear was missed but the high-powered bullet struck into nearly a box carload of dynamite, causing a terrific explosion which shook a camp seven miles distant. A great crater was blown out; all that remained were a few small pieces of bear.

Track laying by C.N. personnel was commenced from Sherridon in mid-August -- Stan Williams, Superintendent, with Bill Sudchak and Bill Samborski, Senior Foremen, equipped with a Pioneer track layer and other power machines. Ralph Welch contracted to supply labor and board the men on the work. He brought in 250 Italians. An excellent co-operative force developed until later, during ballasting, Ralph augmented the number with some men from Germany. Unfortunately, a Nazi element caused serious trouble and adverse publicity for Ralph and our railway; the allegations were entirely false.[37]

Executive V. P. S. F. Dingle arrived 11th October for four days with me, walking a section of the line ahead of the end of steel, Mile 28.7. Snow flurries turned the road-bed into a bog of mud. Stan did not have suitable boots but, being a good sport, he stuck it out, blistered feet and all.

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[37]Although living conditions were comfortable and healthful and regular working times were ten hours, six days weekly, comments in daily newspapers described the situation as 'Slave Labour'.

(36) Bridge erection by Dominion Bridge Company at crossing of the main channel of the Churchill River at Pukatawagan Falls, 30th August 1952. Photo by Ken Hand.

## Revival of Location and Construction

Advance of track work was relative to completion of the roadway day to day. The contractor, by this time, complained of conditions and appealed for financial assistance. Relations between him and C.N. management were not good and deteriorated further until the situation came to a head during Christmas-New Year period, 1952/53. Pitts was fully aware of the understanding between the mine and C.N., for railway freight service to be inaugurated by 15th October.

These circumstances were so favourable to Charlie that he became arrogant enough during protracted negotiations to declare, "I cannot and will not continue." (i.e. without financial assistance.) The job was so isolated and time remaining for completion was too short for it to be practicable to put him off and engage another contractor or complete entirely with C.N. forces.

Upshot of the tangle was a new contract with Pitts, based on cost-plus from commencement at Sherridon. Project Manager McKnight and personnel would continue on the job, however, overall authority would be in my hands. C.N. took over ownership of all camps, stores, fuels and equipment at agreed prices. Turmoil reigned, necessitating me to give even more time away from normal regional duties.

It had been planned for Mr. Gordon to fly from Winnipeg to Lynn Lake to drive a symbolic 'Last Spike', made of nickel, 7th November 1953, but inclement weather prevented flying so the journey was made by special train, consisting of heavy passenger equipment, fortunately without mishap, over track so recently laid. It was a formal ceremony. Mr. Eldon Brown, President, Sherritt-Gordon, hosted a dinner to Government, Railway and Mine officials. Mr. Gordon, during his speech, said that completion of the new railway on time was largely due to my determination.

## Terrace to Kitimat, B.C.

Tweedsmuir Park embraced a wonderland of mountains and lakes with outflow to the Pacific Ocean, by a circuitous route via the Nechako and Fraser Rivers. Studies showed that by construction of a dam, at the east end of the park, a huge lake could be impounded and by releasing it through a tunnel at Kemano, directly into Gardner Canal, a gigantic head could be created for production of hydro electric power.

This situation attracted the Aluminum Company of Canada to confirm earlier findings and to develop this source of comparatively low-cost energy for operation of a smelter not far away at Kitimat at the head of Douglas Channel, a deep-water passage for access to the Pacific, 350 miles north of Vancouver. Alumina, the basic requirement for production of the metal, would be mined in Jamaica and transported by ships through the Panama Canal to the new plant.

Although both imports and exports could be transported by ocean shipping, C.N. was requested to survey the feasibility for a railway connection to Terrace, on the line to Prince Rupert.

Early in May (1951) wild flowers were in bloom near sea level, but not far above, snow blanketed the mountain sides when I chartered a Norseman at Rupert for flight to Terrace and reconnaissance to Kitimat. It was obvious that Superintendent Al Berner would like the experience and, as there were empty seats, I invited him to accompany me.

Our route was over the watershed between the mighty Skeena and the lesser Kitimat River. A wide dense forest lay between them with a jewel, -- Lakelse Lake -- cradled by snow-capped mountains, drained northward to the Skeena. Southerly from the summit, Lone Wolf Creek and Wedeene River make their way to join the Kitimat near its entry into tidewater.

The immediate obstacle to railway location was the Skeena River. During periods of high water, it is about as destructive a mountain waterway as any. We have had many a battle against it between Hazelton and Prince Rupert. So it behoved, if practicable, to select a bridge site with foundations for abutments and piers to be on solid rock. There was but one such site ... Little Canyon, close by Terrace.

From there, the route is along steep side hill of sand and clay, with water oozing from the toe. Unavoidable formation, to a crossing of Lakelse River and ascent by precipitous rock, slopes west of the lake to the summit. Beyond, is a continuous descent, crossing the Wedeene River to reach Kitimat. The overall distance is 39 miles, with maximum rate of gradient 1.50 per cent compensated in both directions.

A more favourable gradient would have increased the length and cost of the railway considerably, without justification in

relation to potential traffic, in competition with ocean shipping and by truckers on a projected highway which became a reality shortly after completion of the railway.

I suggested that a railway and a highway might be unwarranted extravagance; however, the public demanded both, notwithstanding grumbling about C.N. financial results; and not understanding its position burdened with interest payable on debts of long ago.

By mid-summer, an agreement was concluded with Alcan, guaranteeing sufficient annual traffic for viable railway operation. Location surveys had to be commenced immediately. W. H. (Pat) McIlroy had no location experience, but during the 1948 floods he showed get-up and go, so I had him assigned, with a party and camp outfit, to conduct surveys to establish the location. A real challenge in the rugged, densely-forested terrain, with no surface access except a rough trail to the north shore of Lakelse Lake.

From end to end, a line would have to be cut through heavy timber, spruce, hemlock and cedar, with trunks 6 to 8 feet diameter, heights to 200 feet, and underbrush. How were we to transport the supplies required and move camp as the survey progressed? There were no grasslands to support pack horses. Few men would backpack. No navigable waterways existed. Lakelse Lake was the only intermediate spot float planes could land on.

A land surveyor, George Smith, one of his assistants and I walked through in three days. My diary, 25th August, notes, "walked from Railey Creek to near Goose Creek, very heavy going account devil clubs and other underbrush. Many grizzly bears feeding on salmon returning to spawning grounds.

It was obvious that light aircraft would have to be operated for transport of supplies. One door would be removed to facilitate dropping packages attached to miniature parachutes; Pat became quite adept. When it became necessary to move camp, an entire set of tents, etc. was dropped at the new site. Equipment at the former camp was left behind to be retrieved when the right-of-way would be opened up, so there was but little loss. Progress of location was definitely expedited by this method.

One day a V.I.P. arrived from Montreal to go to Kitimat. He observed Pat dropping supplies and was critical about it, with respect to safety; and, subsequently brought the subject up at

System Headquarters. Reverberations reached Winnipeg and were directed to me. My reply was, "I would be happy to be advised of a more practical method under the prevailing circumstances. We heard no more.

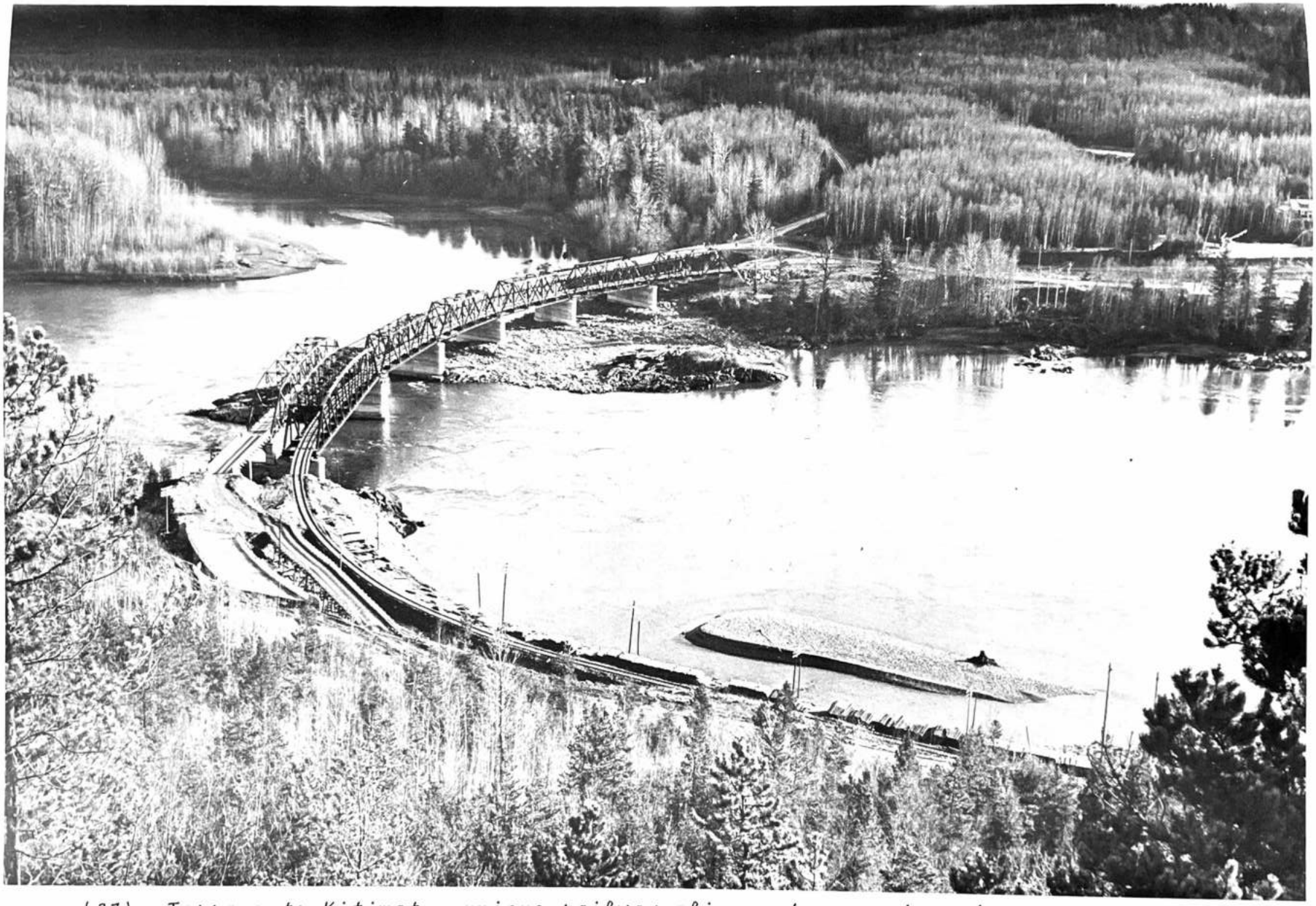
By the end of October rains fell in torrents, soaking everything. This must be accepted as part of the job for progress to be made during winter. My diary, 27th October, reads, "At McIlroy's camp by Lakelse River. Very heavy rain, river rising rapidly." The river had to be crossed; it was a tricky operation. There was but one boatman, Roy Jordan, experienced on fast water; teaming with him to ferry the others to and from work recalled old times on the Fraser.

The cook, Sid Jones, deserved and received great appreciation for serving good meals under deplorable conditions. Although tents had double roofs, rain continually dripped onto the cook stove and it was so dark beneath the giant evergreens that, even at noon, lanterns were necessary. In spite of this, Sid turned out delicious hotcakes and bacon with maple syrup each morning and, at supper, his speciality was clamchowder with real body, and his home-baked bread was always excellent. I looked forward to my visits, rain and all. Before Christmas, heavy wet snow piled up on the summit, in contrast to the dry crisp snow about Lynn Lake.

Little Canyon, the site selected for bridging the Skeena River, had objectionable features ... sharp curvature and the existing highway would have to be moved some feet to permit construction of abutments and piers for the railway structure on solid rock. When the preliminary design was viewed at Montreal, it was jokingly remarked, "It could not be made worse!" Ross Stewart, System Chief, made a visit to examine the ground with me. In view of the characteristics of the Skeena, he agreed with my plan and with my request to consult with Bill Walkden. Diver George Knight was engaged to examine the rock under water but the turbulent current prevented him from descending. Drilling from the surface, however, was successful.

Of course, it was obligatory to confer with the Provincial Department of Public Works to shift the highway bridge. Fortunately, we received the utmost co-operation to this unusual request, on the understanding that all costs would be borne by C.N.

Weather conditions throughout the winter, 1951-52, were very difficult for the survey party to struggle against. At the end of



(37) Terrace to Kitimat - unique railway alignment, a series of compound curves, to locate the foundation of piers and abutments on solid rock, for bridge to cross the Skeena River near Terrace. During periodical floods the Skeena is extremely 'wild', eroding its banks and channels.
C.N. Photo

May, remaining snow was four feet deep on the summit.

Tenders for clearing, grading, timber bridging and culverts were advertised for early in September 1952. As it was very difficult work, only two firms, Brown & Root of the U.S.A. and Campbell-Bennett of Vancouver, submitted bids; the latter was by far the lower and was accepted.

The contract included a very heavy schedule for erection of timber pile and frame bridges. Campbell-Bennett sublet this to 'Bun' Dobson, who employed a small but highly efficient gang working but five days weekly. Every frame was carefully laid out; it was inspiring to observe those men in action.

Separate contracts were entered into for the concrete sub-structure for the Skeena River bridge and for erection of the steel superstructure, with Dawson and Hall and Dominion Bridge, respectively, including relocation of a section of the existing highway bridge. This required very close co-ordination.

Campbell-Bennett commenced clearing right-of-way, the heaviest I have seen, from both Terrace and Kitimat early in November 1952. The butt of a large spruce measured ten feet in diameter. All merchantable logs were cold-decked to be marketed when they could be shipped by train.

Grading was commenced from the north end, 15th April 1953, in extremely difficult conditions. Water oozed from the steep sandy side hill on the ascent from the Skeena crossing. Slides occurred in saturated fine-grained clay at Alwyn Creek; boring disclosed this condition to a depth of over 100 feet, so a long pile trestle was driven on extraordinary alignment -- reverse curves.

Along precipitous mountain side facing Lakelse Lake, rock cuts had to be excavated to depths over 100 feet, to be built into embankments of similar dimensions. Although rock work is costly, it forms a solid roadway for all time.

But on the slopes of Lone Wolf Creek, more mush, almost soup, of fine-grained grey clay. Although Pat cautioned me, I stepped into it and really bogged down. If he had not been on firm footing and able to extend an arm to pull me out, I would have had an unpleasant time waiting for assistance. As it was, I lost my hip rubber boots; suction held them fast.

The splendid timber close at hand provided the means to cross this area. Corduroy of logs, 2 feet to 3 feet in diameter, was placed with a layer of gravel on it to support skeleton track until it was finally ballasted. No difficulties developed during subsequent maintenance, the saturated buried timber remains sound.

Conditions close to the Wedeene River were disappointing. Boring to the extent possible by hand during location survey indicated granular material, but when excavated to depth, there was a percentage of inferior wet soil which caused the whole to be unstable for building into embankments. Tens of thousands of cubic yards had to be cast away, clear of the right-of-way and, in place of it, cleaned washed gravel was hauled in from the river bed. This doubled the quantity of grading there.

On the other hand, at Kitimat, the river continually cut into the toe of a massive formation of sand and gravel which became known as the Sandhill; great quantities were excavated to form the railway embankment and later, for ballast; also for roads and concrete aggregate at Alcan plant and town site. Alcan took it upon itself to claim ownership of this 'Godsend' and informed C.N. that it would be charged for all quantities used for railway construction. This was quite unreasonable as I had observed the Sandhill on my first walk from Terrace to Kitimat and realized what a valuable asset it would be. I replied to Alcan's claim, "it would appear that the Creator deposited this granular formation to be of mutual assistance to Alcan and C.N. during construction of the entire project, including the railway," and closed the subject.

C.N. engineers' headquarters camp was set on the south bank of the Skeena River, across from Terrace town. It was a beautiful site. This was home for draftsman, Jim Walker and, later, Percy Curd, also when track laying was commenced for Stan Williams too, and sometimes for me. We had such a good-natured cook, weighing about 300 lbs.; she was excellent and was given a free hand to shop for supplies in town. It was a treat indeed to stop over there.

Pat McIlroy's wife and children resided in their own home in Terrace and so did despatcher Fred Musgrave and wife, also equipment supervisor Ron Bunn and family.

Out on the line, there were four resident engineers and staffs in shack camps. One was on the timbered slope overlooking Lakelse Lake and the snow-topped mountains beyond. The engineer was Jim

(38) *Terrace to Kitimat - reverse curves on timber bridge, by reason of adverse soils at crossing of Alwyn Creek 1954, C.N. Photo.*

Cant, an ascetic and capable young graduate from U.B.C., but he did not appear to appreciate the grandeur of his surroundings. This was beyond my understanding; American tourists would have paid heavily for the privilege to enjoy such a camp site. And, across the lake, mineral hot springs bubbled up through mud to relieve body aches.

At the water edge there was a small shanty of cedar logs, a trapper's abandoned home. I renovated it to be my personal stopping place whenever work would permit. Some evenings the lake surface was a giant mirror and, at other times, the lapping of waves on the rocky shore was music to induce untroubled sleep and awaken refreshed for a plunge and morning drink of the unpolluted water.

One fine afternoon, I hankered for a salmon and set out to get one the easy way ... snare it from the sluice box of the Biological Station weir on the Lakelse River. Being Saturday, I assumed the fisheries men would be away to Terrace for a beer. All went well until I jerked up a fine fish and heard a shout, "What the hell are you doing?" Somewhat set back, I said, "I want a salmon," and was told, "Take it and get to hell away!" The guardian knew me. Sunday dinner was delicious.

By the first of June, 1954, grading had advanced for a few miles to permit track laying and ballasting, but was held up time and again by uncompleted roadway. On 31st August, steel again proceeded but only to Mile 17. Bob and Colin Campbell conceded that they were behind schedule and accepted assistance from C.N. -- the loan of two diesel shovels and operators, chargeable, of course, to their contract.

Walking by our track gang, I had a humorous little dialogue with likeable Shorty Van Cauwenbergh. "How about getting my pay raised so that I may take a trip to Hawaii?" "If you work and save as long as I have, you will be able to go too." "Oh hell, I want to go now." Within a few hours I returned and was shocked to see Shorty, dead, covered with a tarp. He had been positioning rails with a cat on the deck of a flat car, the machine fell over the side and crushed Shorty's skull. It was a sad loss of a promising young man. His body was sent for burial at St. Boniface and I was privileged to express my respects to his parents.

Fall was approaching with but one-half of the track laid. Superintendent Stan Williams and Senior Foremen Bill Sudchak and

Bill Samborski were faced with driving the steel ahead, under the worst possible conditions. Rain, day after day; everything was sodden, and light onto the right-of-way was restricted by cloud cover and the dense tall evergreens to six hours a day. Nevertheless, the leadership and 'know how' of these officers kept up the morale of their men.

The work week was six days of ten hours and, for those who wished to make more, another three or four hours after supper and on Sundays. It was impracticable to avoid being soaked to the skin. If heavy garments shed rain, the wearer would soon be wet from body perspiration. Clothes could not be thoroughly dried overnight, so each morning they were donned partly wet.

It was essential to immediately ballast the skeleton track to support it from becoming mired. Alex Lichowit was foreman; another dedicated man from the H.B.R.

The initial railway station at Kitimat was opened December 15, 1954. But driving the symbolic 'Last Spike', made of aluminum was deferred until favourable weather could be expected. This colorful ceremony was performed by Mr. S. F. Dingle, Executive V. P., Canadian National, under brilliant sunshine, 8th July 1955. Tickets for travel on the special train were printed on aluminum and Alcan spread generous hospitality to the many visitors.[38]

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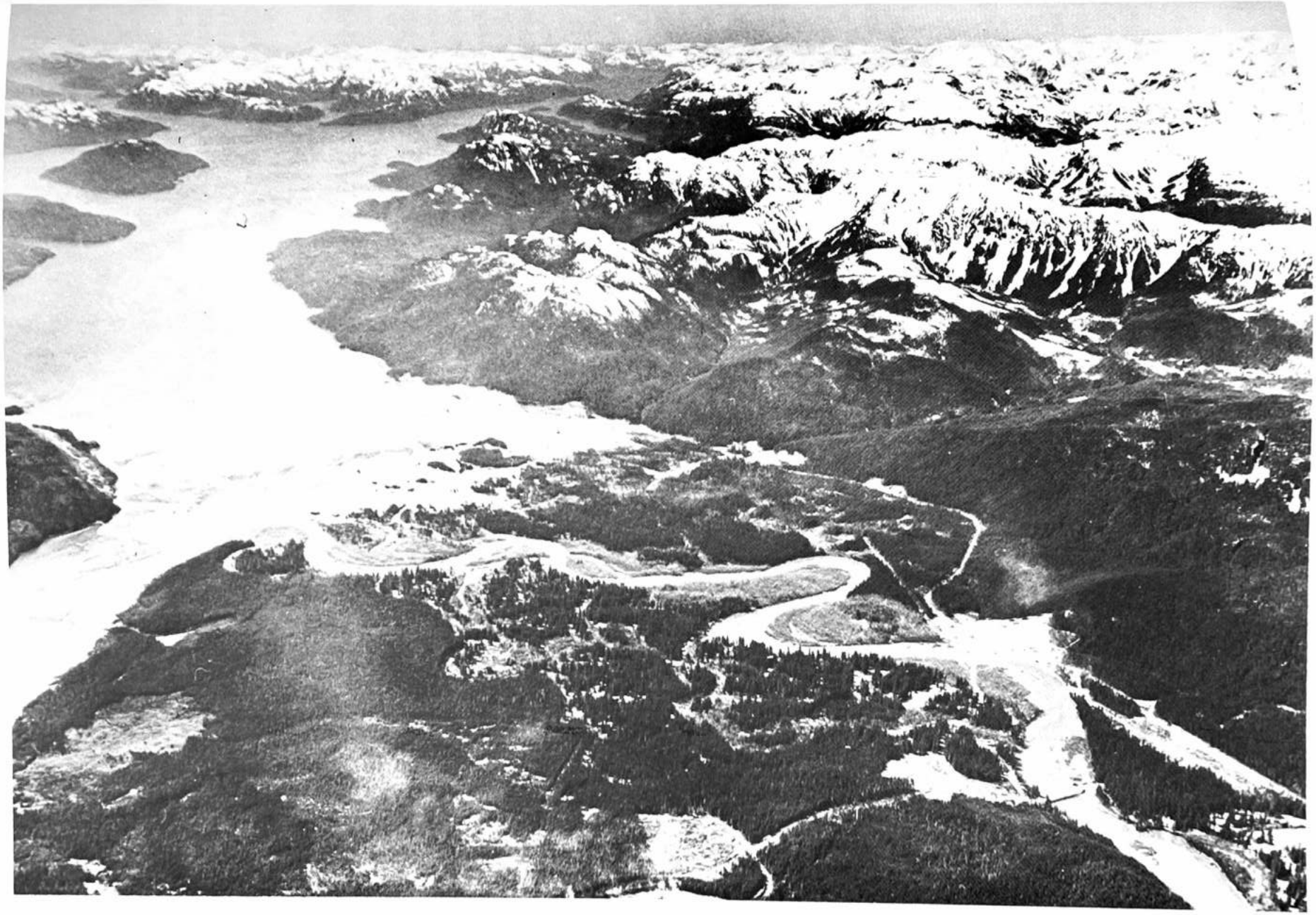
[38]David S. Boyer, "Kitimat - Canada's Aluminum Titan," National Geographic, CX (September, 1956), 376 - 398.

(39) Terrace to Kitimat - location survey, a 'window' cut into a large cedar to avoid having to fell it. C.N. Photo.

(40) Terrace to Kitimat, 1954, Extremely unstable soils - fine grained saturated grey clay - were encountered. Cross-logging was necessary to support skeleton track. These heavy logs, preserved in water, are under the ballast and track today, after twenty one years, without settlement. Ken Hand is viewing the situation. Photo by J.L.C.

(41) L. to R.:-Senior foremen Bill Samborski and Bill Sudchak with Supt. Stan Williams at Mile 15 Terrace to Kitimat, 1954, these dedicated C.N. officers, with leadership and 'know-how' laid track to Lynn Lake, Kitimat, Thompson and Chisel Lake. C.N. Photo.



(42) Kitimat townsite and Alcan plantsite by the mouth of Kitimat River flowing into Douglas Channel. Railway right-of-way shows on the west side of the river, note the station grounds, wye and sand hill. C.N. photo.

9. INTERRUPTIONS

From time to time, emergency situations demanded immediate attention, together with normal maintenance of way and construction of new lines. This was inevitable as the forces of nature never rest from eroding the earth's surface and building it up elsewhere. Two disastrous incidents during the early fifties were:

Red Deer Steel Viaduct, near Ardley, Alta.

Sunday night, 22:30k, 6th April 1952, I was stirred by a phone call from the Chief Despatcher at Calgary advising that Bridge Mile 12.9, Three Hills Subdivision, had been carried away by movement of ice in the Red Deer River. This was staggering. I knew the site well ... a deep wide valley crossed by a steel viaduct, high towers erected on concrete pedestals and deck truss spans far far above any possible high water and ice run-off; that it was destroyed was beyond comprehension.

First available T.C.A. flight from Winnipeg to Calgary, then a car, took me to Ardley by 10:30k next morning. The message had not exaggerated. The proud structure was gone. An ice jam up-stream suddenly broke loose and was swept down at extraordinary water level, to sheer the bases of the towers from the pedestals. Huge blocks of ice were all about, stranded on the valley floor. One half-mile away, the bridge, twisted masses of steel, had come to rest.

Obviously it had all happened within minutes -- a million dollar disaster. It would be months before railway operation could be resumed and questionable whether the cost for replacement was economically justified on this branch line, especially as there was an alternate line, almost as direct, between Edmonton and Calgary. However, thorough analysis deemed the structure should be replaced and a contract was awarded for fabrication and erection.

Bridge, Mile 109.3, Ashcroft Subdivision, B.C.

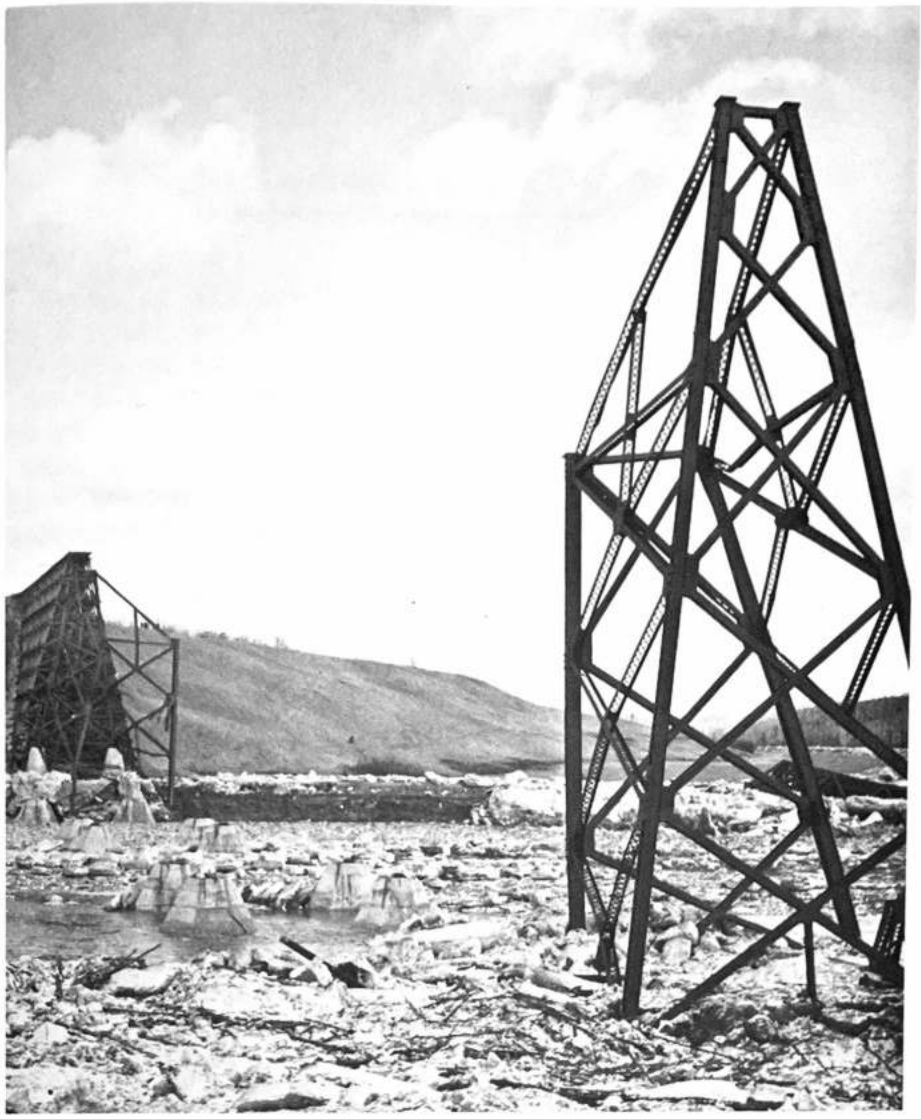
The site of this bridge is on almost vertical rock mountain side on the mainline near Boston Bar. A phone call from Jack Cann, District Engineer, advised me that the steel span had been struck by a rock slide into the Fraser River, 23rd November 1953. Traffic to and from Vancouver was diverted over the C.P.R. between Basque and Hope; both railways operated over one another's track during emergencies.

Interruptions

Often there is an amusing feature in relation to a serious situation. As the first flight from Winnipeg was entirely booked, T.C.A. gave me a jump seat behind the pilot. Over the Rockies there was turbulence when the stewardess brought coffee and placed my cup on a little shelf close by. A sudden upheaval spilled the coffee over the fly of my light shade suit. When the pretty girl returned to gather the empties, the pilot said to her, indicating me, "Look what that fellow has done! Take him back and change him!" Of course, there was a good laugh all around and on arrival I departed with 'tail between legs', hoping the stain would not be noticed.

It was typical Vancouver fall weather, heavy rain day after day. Jack was at the airport ready to drive to Falls Creek where Harry Robertson, General Superintendent, was in his business car, near the scene. There was but one action to take -- erect a temporary frame trestle. Fortunately, Merle Johnson, B. & B. Foreman and his gang, also timber, could be moved up quickly.

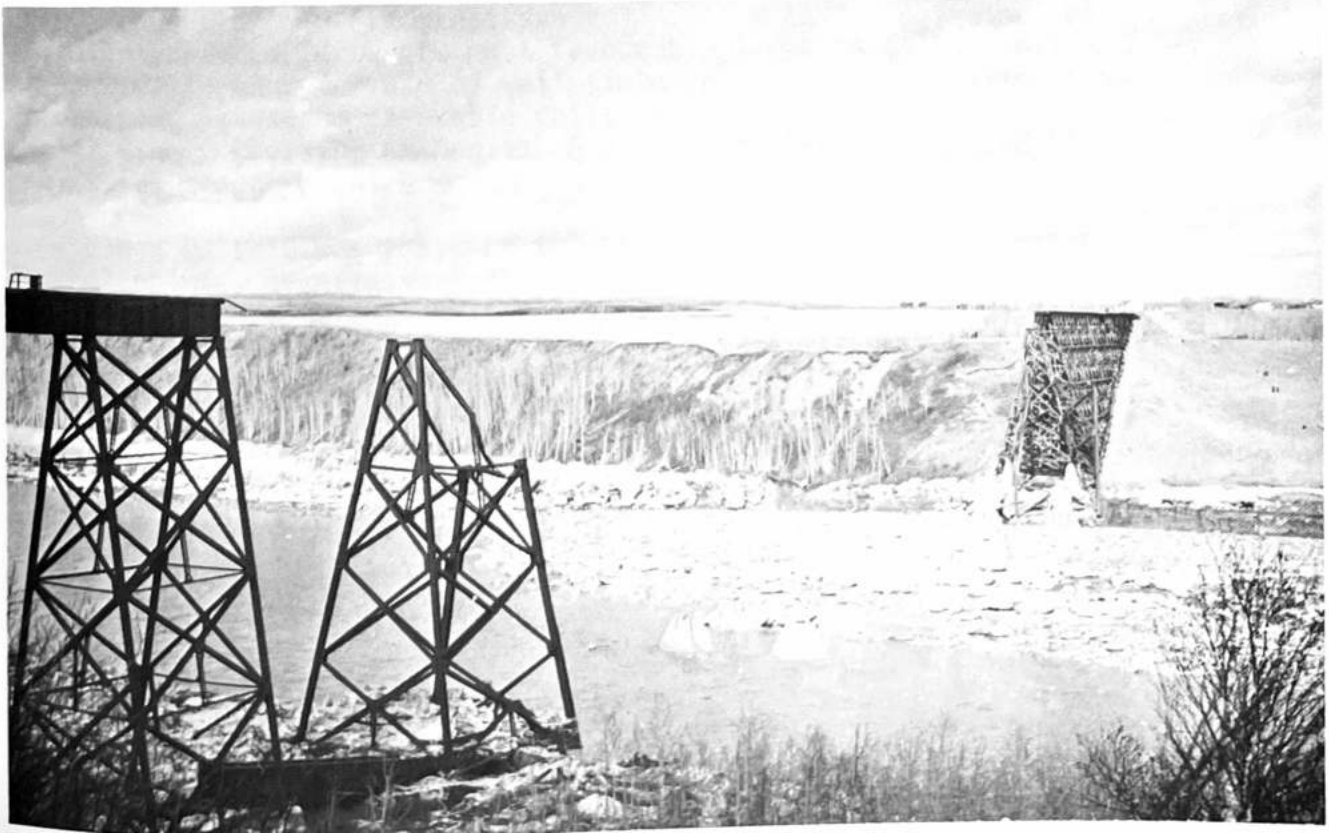
Next morning, Joe Conrad arrived and, on the spot, sketched the design for Merle to build. Joe and Merle had worked together on many emergencies, they were masters. At 15:40k, 1st December, the first train passed over to carry traffic until a new steel span was fabricated and erected.



(43)

el viaduct, Mile 12.9 Three Hills Subdiv., crossing the Red Deer River
Ardley, Alta., was destroyed when an ice jam upstream broke 6 Apr 1952

(44)



10. MORE MINING DEVELOPMENTS

Mineral deposits are exhaustible, some within twenty years, others may be productive for much longer. To keep the industry alive, search goes on and on. The old-time prospectors, with some basic knowledge of geology and much optimism that they would reach the end of the rainbow to discover a 'pot of gold' ... indomitable men, and a few women too ... pushed into the unknown; alone or with a partner or two; on foot, or by canoe during summer; enduring discomfort from pests, mosquitoes and black flies and, at times, meagre fare. During winter some would trap for furs to 'keep the wolf from the door'.

Today, the lot of prospectors is alleviated by major mining companies assisting with aircraft for travel to distant fields and with technical innovations -- airborne magnetometers and other advanced equipment to criss-cross vast regions for spotting anomalies, even indicating mineralization at depth; a far cry from searching on foot for surface exposures.

Bruce Lake, Western Ontario

Drilling of iron-ore at Bruce Lake, near Red Lake proved up sufficient quantity for development of a mine and construction of a railway northerly from C.N. mainline to be viable. The product to be transported in unit trains to Thunder Bay, thence by ships on the Great Lakes to steel mills.

Ben Chappell and Eldon Dolphin accompanied me in Car 73 on an overnight run to Sioux Lookout. Next morning, May 26, 1956, we chartered a plane for reconnaissance. A point on the mainline near Amesdale appeared to be the most favourable location to turn off northerly, through terrain of well-timbered rolling hills with many intervening lakes and favorable soils, earth, sand, gravel and rock, for grading. Crossing of English River at Ear Falls presented the only steel bridge requirement.

Eldon Dolphin was assigned to establish horizontal and vertical control points, as necessary for photogrammetric contour strip mapping of the route through this pleasing country. There were high-class fishing and hunting resorts easily accessible by highway. As maps were received from Photographic Surveys, Toronto, the proposed railway location was projected and staked on the ground, a distance of 68 miles and an approximate cost for construction was estimated.

Eldon completed this preliminary survey just in time to move on Labour Day to north of The Pas.

Construction to Bruce Lake was deferred through financial circumstances until 1966. Lloyd Hostland then directed the project. The first train of iron-ore was despatched early in 1968 to Thunder Bay.

## Thompson, Northern Manitoba

Albert Johnson, old-time prospector, discovered nickel-bearing rock in the Mystery Lake-Moak Lake area. International Nickel Company of Canada became interested and agreements were entered into to investigate the field now generally known as Thompson.

Notes from my diary read:

"23rd August 1956 -- Left The Pas with chartered Lamb aircraft for railway reconnaissance survey from Sipiwesk (Mile 200 H.B.R.) to Moak Lake.

"24th -- Sounded possible crossings Grass River and Burntwood River.

"25th -- Conference with Inco engineers; returned to The Pas and on to Winnipeg.

"26th, Sunday -- Met Mr. Ralph Parker, V.P. Inco, to discuss the route.

"3rd Sept. -- Left Winnipeg in Car 73 for Thicket Portage; Eldon Dolphin with me; also R. Hammond Innes, English novelist as guest. After dinner his modest tales of adventures in many lands were very entertaining."

After Eldon pitched camp and commenced to run preliminary location, it was his responsibility to expedite the work. Canadian Aero Services, Ottawa, would plot contour strip maps, using Inco aerial photographs and controls.

Air services from Winnipeg which took off from the Red River, near St. Andrews, direct over Lake Winnipeg, were convenient for periodic inspections of progress. One trip was memorable. Mr. Parlee, Inco Manager, and I were sharing a charter from Lamb Airways. During the

transfer from C.P.A. at The Pas, Jim, fond of children, stuffed my young grandsons, John and Bruce, with goodies. The boys and I were in the back seat of the Cessna. Very soon John said, "Grandad, the air seems funny," then ... Whoop ... up came all.

The pilot landed on the sparkling water of beautiful Setting Lake so that I could get the boys out onto the pontoons to swab them off and mop out the cabin. What a job that was, regurgitated milk-shakes and chocolates make a really sticky foul mess, tough to be rid of. It was a good introduction for the boys into the north, but don't stuff young children before taking off in light aircraft.

At the Fort Garry, 5th December, Inco hosted a dinner for Provincial Government, Hydro and Railway officials to announce plans to proceed with the project on the understanding that Manitoba Hydro would harness Grand Rapids, on the Nelson River, to transmit power to Thompson. This entailed a railway spur for delivery of heavy generating equipment. Hydro Chief Engineer requested me to reconnoitre the route, which I was pleased to do as a public relations gesture.

Inco pressured C.N. for railway service to Thompson at the earliest practical date, certainly within one year, so that winter 1956/57 would be the last of high-cost tractor freighting from Thicket Portage.

Location being surveyed for the railway, a distance of 31 miles, was through rolling hills of rock, clay and muskeg, in the discontinuous permafrost zone. There was no sand or gravel along the route, therefore grading with unstable clay was unavoidable, excepting for embankments adjacent to rock cuts. The area was fairly well timbered with spruce, jack pine, aspen and willows and a few birch.

The Wintering River and the Grass River had to be crossed. The Grass, midway along the line, presented a difficult obstacle. The site is at a narrows, 200 feet wide, with banks of solid rock, ideal for abutments. Between, there was no great depth of clear water but, beneath, there was an undetermined depth of a mixture of water, vegetable matter and fine-grained clay, commonly known as 'loon shit', quite incompetent to support any weight whatsoever.

If speed had not been the essence, the obvious solution would have been to design a steel truss to span from rock to rock; but

there was not time to fabricate, deliver and erect such a structure; this was out. And, a timber pile trestle was out too; even if piles of sufficient length could have been obtained, it would be impractical to brace them in each bent and from bent to bent.

Both approaches to the river were through heavy rock cuts. It appeared that if the waterway might be partly filled with solid rock to form an underwater embankment to a height of ten feet below high-water level, timber (cedar) rock filled cribs might be built as piers to support miscellaneous girders available in C.N. stock at Toronto, that could be shipped to Sipiwesk and thence by winter tractor trail to the bridge site.

The flow was measured to ascertain whether an artificially-restricted channel would be of sufficient cross-section to carry the maximum spring run-off.

Whether or not quantities of excavated rock, dumped into the ooze, would form a solid foundation for crib piers, however, was indeed questionable. I decided to take the risk. Jim Parlee, Inco's Manager, shook his head and consulted Foundation Company engineers; they too had doubts. The C.N. System Bridge Engineer at Montreal was also skeptical; but none suggested an alternative, in view of the time restriction.

No doubt it would be a gamble -- hardly a calculated risk. I accepted the responsibility and our bridge engineers designed the structure to have four rock-filled cribs, supporting five steel spans of odd lengths, two of which were from a dismantled turntable. The rock embankment was built with a wide base and the height was heavily overloaded, then the superimposed burden was removed. No unforeseen settlement occurred.

"Lady Luck" smiled. I was over this bridge during August 1974, seventeen years had elapsed; rails were in good line and surface.

Dr. O. M. Solandt succeeded Mr. Fairweather as Vice-President of Research and Development. On July 18th he arrived, with Maj. Gen. N. E. Rodger as guest, to inspect progress on construction to Thompson and also Hydro's development of power at Grand Rapids. As they were so keenly interested, it was a pleasure to conduct them. We were accommodated overnight by Eldon Dolphin in his camp; wife and young son were there too. The camp site was in the shade of spruce, jack pine and birch on the bank of Grass River, overlooking

vast expanse dotted with rocky islands ... an entrancing prospect.

Next day we flew to Flin Flon and were guests of Hudson Bay Mining and Smelting Company for luncheon. The subject of this company's plans to bring in a new mine at Chisel Lake was discussed. From Flin Flon, Dr. Solandt and General Rodger commenced another of their canoe journeys to retrace routes of old-time fur traders.

Location survey was completed just before Christmas but there was no let-up. My diary for Sunday, 23rd December 1956, reads, "At office in morning working on specifications for Sipiwesk to Thompson."

In order to circumvent time required for C.N. to apply for a charter for construction, it was decided that Inco would be the 'Owner' for the time being and enter into the contracts required and make customary monthly and final payments. The works, however, would be laid out by C.N. engineers, with on-the-job supervision by Eldon Dolphin, under my general direction, specifically named as Chief Engineer in the agreement between Inco and C.N. It included terms that, on completion of this railway, Inco would dispose of it to C.N. at actual cost, less the amount incurred by rushing construction (above normal) to effect savings for Inco, in particular by terminating tractor freighting over frozen lakes, rivers and portages.

Tenders for clearing, grading, culverts and timber bridges were not advertised. Selected contractors were invited to submit bids. Copies of maps, specifications and form of tender were given to a number of well-known firms, with instructions that their representatives inspect the site of the railway before estimating.

There was no lost time. Mr. George Thorpe of Inco called on me at 17:30k January 8th, 1957 with the bids. Together, we opened and tabulated them for submission to Mr. Parker.

The lowest amount, calculated on unit prices, was from Aklavik Constructors of Edmonton, but the price for excavation of solid rock was, in my opinion, far too high; so Norman Venables, who had prepared the bid, was called in and given an opportunity to review the unit prices, but not to change the total amount.

Venables stated his price for rock was high as he thought huge quantities might have to be dumped into the Grass River crossing and,

if so, a 'killing' would be made. This was revised and Aklavik's bid tentatively accepted. Mr. Parker dictated a letter of intent, on the spot, pending confirmation of Aklavik's principal, Merv. (Red) Dutton of Standard Gravel & Surfacing Co., Calgary, whom I knew personally. I phoned Merv., only to be informed that he was somewhere in Hawaii, however, Vince Dunne, Manager, assured me that Merv. was personally behind Aklavik, so I had no hesitation in recommending acceptance to Mr. Parker. It was all settled in his hotel room, without a break, that evening ... a quick satisfying way to conduct business.

It was imperative that the contractor set up camps and place all fuel, explosives, culvert pipes, bridge materials and supplies along the line within two months, a real hustle, before winter freighting would stop and surface access close, except by canoe and on foot. R. McKay (Dick) Venables, Norman's younger brother, was appointed Aklavik's superintendent and some miles of grading were sublet to Jim Quinn of Winnipeg.

Steel for the superstructure to cross Grass River was shipped by C.N. from Toronto to Sipiwesk, thence by tractor before spring break-up. Dominion Bridge contracted to erect it.

In preparation for track laying, C.N. moved the Pioneer from Kitimat to Winnipeg for redesign. Together, the engineering and mechanical departments rebuilt the machine to be entirely self-propelled and capable of hauling materials, ties, rails and fastenings, required for one shift of ten hours. Powered by a diesel engine for propulsion, operation of air compressors and electric generators, all assembled on the deck of an oversized flat car, the basic unit of the Pioneer.

Ties were moved to the front end on power-motivated roller conveyors and rails on an overhead gantry to be positioned on the road-bed -- a completely mechanized assembly-line operation at a steady speed of 9 feet per minute, under all weather conditions, with a gang of forty men, including operation of powered spike drivers and joint bolting machines.

Track laying and subsequent ballasting were supervised by Stan Williams, together with his team of stalwart foremen.

Inco chartered a special passenger train to carry and entertain guests -- federal and provincial officials, business executives,

(48) Track laying to Thompson, August 1957 - showing the 'Pioneer' moving steadily forward 9 feet per minute, hauling ties, rails and fastenings required for one ten hour shift under all weather conditions. C.N. photo.

(49) Tracklaying to Thompson - front end of the 'pioneer', a self-propelled machine hauls all materials required, ties are brought forward by conveyor from flat cars in the rear and rails by overhead gantry. CN Photo.

(50) Passenger Special to Thompson for ceremony of 'Driving the Last Spike' 20th Oct 1957, crossing the improvised bridge over Grass River, designed to circumvent waiting for fabrication of an orthodox span. Credit Inco photo.

railway officers, contractors and newsmen -- to the 'Last Spike' ceremony at Thompson, 20th October 1957. With a claw bar, I held a solid nickel spike for the Honourable D. L. Campbell, Premier of Manitoba, to drive. Earlier in life, he had been a farmer; to swing a maul was not new to him so he did his job smoothly, to applause of the spectators.

After the guests returned to the special train to partake of Inco's generous hospitality, the nickel spike was replaced. Mr. Parker took it to Toronto and later sent it to me, engraved,

"This spike was driven by Premier D. L. Campbell on Oct. 20, 1957 to mark completion of the railroad from Sipiwesk to Thompson which project was carried out with distinction, under the direction of Major J. L. Charles."

I deeply appreciated this thoughtful recognition and remembrance of the helpful co-operation given me by officials of the International Nickel Company.

Dick Venables fulfilled Aklavik Constructors' contract with efficiency and settlement was made amicably. I believe it was profitable, as contracts should be, with mutual benefits to all the principals.

A week or so later, Mr. Parlee (Jim) called at my office to discuss the matter of how much pressuring the job, beyond normal practice, increased the cost. Within ten minutes we came to agreement -- $250,000. in favour of Canadian National.

## 11. A SIGNIFICANT PERIOD

Normal date for my retirement should have been my sixty-fifth birthday, 15th December 1957. Reg. McMillan, V. P., spoke to me about future construction, and President Donald Gordon, during a stop off at Winnipeg, 9th May, summoned me to his business car to discuss my future. He said he knew I could obtain higher remuneration than C.N. pension plus supplementary amount to make a salary equal to my rate as Chief Engineer, however, on this basis the Company would be pleased to retain my service to be Consulting Engineer (System) ... "Think it over." I replied, "C.N. has been good to me, I will be happy to continue." We shook hands on the deal and it was confirmed by letter.

In addition to regular regional maintenance of way and structures, including the new lines to Lynn Lake and Kitimat, there were betterment programs -- bank widening, crushed rock ballast, relay with heavier steel, replacement of timber bridges with concrete and steel and installation of automatic signals.

During April, serious landslides occurred at Mile 34.5, Tete Jaune Subdivision. I reflected on the circumstance, during the spring of 1912, that caused L. C. Gunn to resign because his location on the opposite bank of the Fraser River was not accepted. Would it have been better?

Construction to Thompson was in full swing and an extension to Moak Lake. Feasibility studies for new lines to Chisel Lake and to the Bituminous Sands at Mildred Lake, Alberta, were called for; also, I suggested and was authorized to make aerial reconnaissance beyond to Great Slave Lake.

At Churchill I gave a paper, "Railways in relation to the development of Canada's Northlands"[39] to a group of Intelligence Corps officers from the British Commonwealth and from the U.S.A., at the Northern Defence Research Laboratory. This became an annual duty for some five years; very pleasant too for it gave me opportunities to associate with widely-travelled officers, including some women scientists; also the price of Drambuie in the Mess was but 25¢.

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[39] J. L. Charles, "Railways in Relation to the Development of Canada's Northlands," Winnipeg, Canadian National Railways, 1957. (Typewritten).

A Significant Period

During the August Civic Holiday long week-end, I reconnoitred on foot a route for a branch from the Ontario Northland Railway, to serve the Jones & Laughlin Steel Corporation in the Kirkland Lake area. A short line, but in rugged rock and lake terrain; it was my first visit to this legendary mining field.

To Chisel Lake, Manitoba

As mentioned above, 19th July, Dr. Solandt and I were informed by Mr. Eric Austin, Vice-President, Hudson Bay Mining and Smelting, that his company was planning to bring in a mine, basically zinc and copper, at Chisel Lake and the ore would be smelted at Flin Flon; railway transport was now requested.

H.B.M. & S. helicopter was put at my service for reconnaissance and, as a result, it was decided that the most practical route to Chisel Lake would be to turn off from the existing line at Optic Lake, north of Cranberry Portage, thence north-easterly across the Grass River and by the west side of Reed Lake, approximately 52 miles.

Targets were set up to identify control points to show up on aerial photos to be taken by Canadian Aero Service, before snow-fall, for photogrammetric mapping.

Eldon Dolphin, having completed his part of the line to Thompson, was assigned to locate this new line. I started him off at Optic Lake, 30th November, and stayed with him a few days. The transit man was a New Zealander, John Baker, in Canada to gain experience; winter conditions, including living in a tent with temperatures down to minus 50°F and deep snow, were strange to him but he adapted quickly.

As Ben Chappell had succeeded me as Chief Engineer of the Western Region and my duties were now entirely location and construction, over the whole system, I was able to join Dick Venables on a moose hunt before Christmas. Moose are extremely watchful; they never feed nor bed down without making a circuit so that they face their trail to be in position to observe any tracker. It requires experience to outwit and shoot a moose. Then the work begins, gutting, skinning and quartering such a large animal, and packing it through bush to the nearest transport. My moose was a nice young bull but, by the time it arrived in Winnipeg, it was expensive meat; there was far more than Helena and I could eat, but our friends and also the Salvation Army appreciated some of it.

A Significant Period

In the afternoon of New Year's Day, 1958, Norwood Masonic Lodge held its annual reception, very enjoyable, although a buffet with but tea and coffee. George Clark was honorary organist and always played "Home on the Range" and "Red Sails in the Sunset" for me.

Dolphin and party returned from Christmas-New Year holiday, Sid Jones from Kitimat was cook. I joined them in camp by the Grass River and gave them as much time through the winter as I could spare from studies on Great Slave Lake and other projects. The country about Cranberry Portage through to Snow Lake is ideal for winter surveys. It is well timbered with spruce, jack pine, aspen, birch and willows. Large lakes and muskegs are frozen, so transport with Bombardiers and travel on foot with snow-shoes could not be bettered.

By the 15th March, tenders for construction were advertised in all important newspapers. There was keen interest. Mannix of Calgary was low and awarded the contract for clearing, grading, culverts and timber bridges.

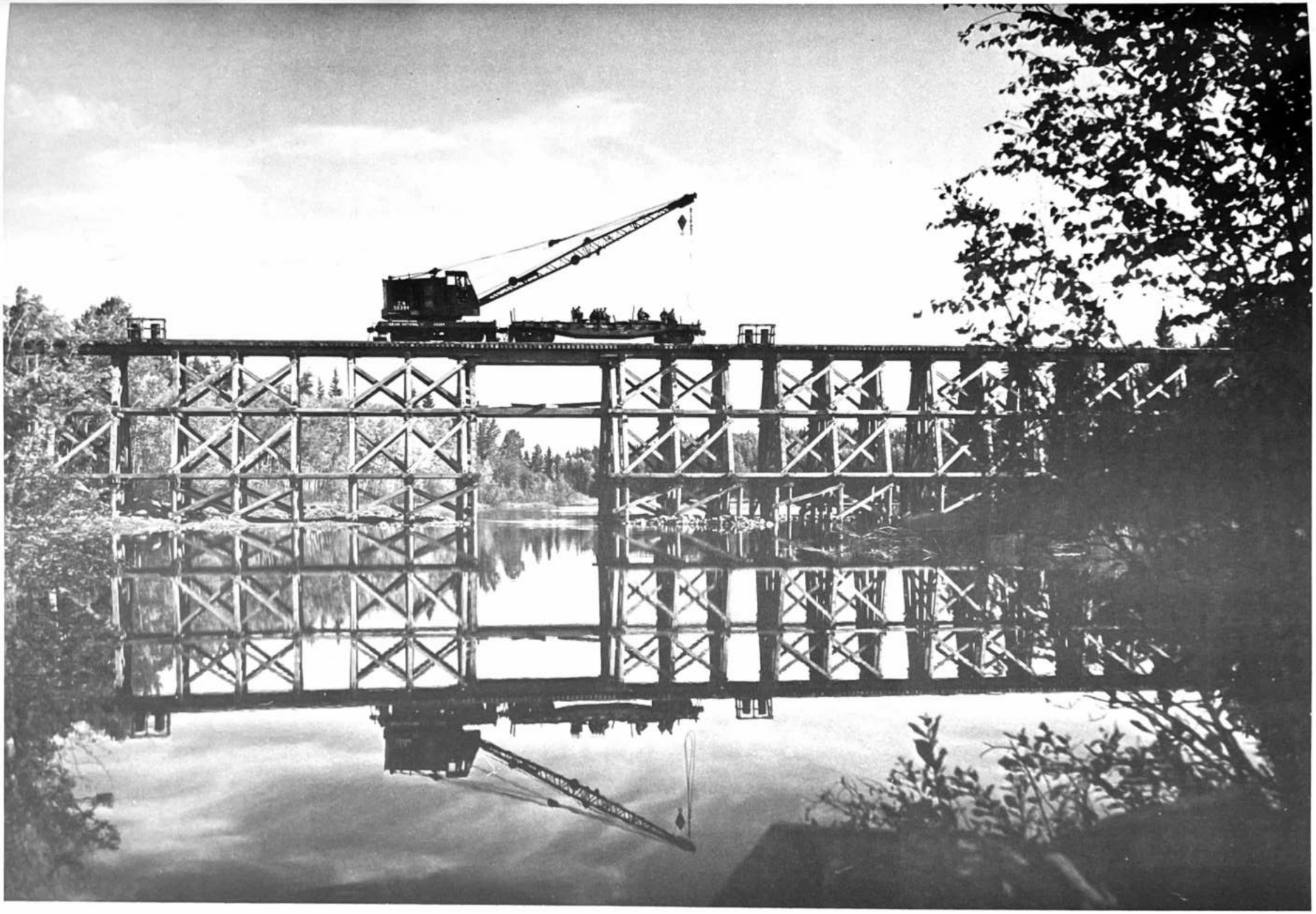
During April, I attended an Extension Course in photogrammetry and, in February 1959, one on air photo interpretation at the University of Alberta.

Dolphin was assigned to supervise construction to Chisel Lake. He set up his headquarters in portable buildings at Cranberry-Portage, and had four resident engineers on line -- Kasianchuk, Baker, Plank and Fridfinnsson -- all good men of whom more was heard. Baker and Plank had very beautiful camp sites by Grass River and Reed Lake, respectively.

As mentioned, John Baker was from New Zealand. Charles Plank and wife came from Uganda in response to enquiries in the United Kingdom; they took the extreme change in conditions, from near the Equator to our Northlands, all in their stride.

Mrs. Plank was, and is, a registered nurse and a talented artist. She painted some excellent water colours about Reed Lake, and life in a tent appeared to agree with Margaret for she became pregnant. She resided in her tent home during mid-winter temperatures, as low as minus 50°F, except for a short trip by bush plane to Flin Flon hospital for the arrival of daughter Sybil, and within a minimum time returned to Reed Lake camp.

(51) Construction to Chisel Lake, Manitoba, drilling rock preparatory to blasting. Mannix Company contract 1959. Photo by L. Monk, C.N.



(52) Optic Lake to Chisel Lake, Manitoba, constructed to serve Hudson Bay M&S Company. Timber bridge across Grass River. Photo by L. Monk 15 Sept 1959.

Mannix put on two strong 'spreads' to fulfill the contract for clearing, grading, culverts and timber bridges under experienced superintendents George Goodine and Ora Bergren. As much of the grading was excavation of solid rock, work continued through the winter of 1958/59.

I took time in January to go on a busman's holiday in Liberia, described further along.

During spring break-up, a request came for me to go for consultation on the location of the Toronto Terminal Project Access Railway; very interesting, through some highly-developed residential property, north of the city. On return to Winnipeg there was the annual interviewing of students about to graduate, seeking permanent employment, and undergraduates for summer work. It was interesting to hear the views and ambitions of these young persons.

May 1st, Harry Minshall, Consulting Engineer, formerly with Dominion Bridge, phoned to say he had been approached by a Colonel Bingham of New York about conducting a preliminary survey for a railway from Prince George to the northern boundary of British Columbia, being discussed jointly by the Provincial Government and the Swedish industrialist, Wenner-Gren. My advice was requested re selecting the route.

At Cleveland, on May 5th, I read a paper, "Some aspects -- permafrost -- of the Hudson Bay Railway"[40] to the Soil Mechanics and Foundation Division of the American Society of Civil Engineers.

On the Optic-Chisel Lake line, portable buildings were hauled by tractor over the frozen Cranberry Lakes for a resident engineers' camp by Grass River; a beautiful site conveniently accessible by Bombardier in winter and, in summer, by boat. These buildings were planned for use by section forces when the operating department took over. I noted, "29th May, still considerable ice in Second Cranberry Lake."

The Annual Dinner Meeting, Board of Governors of Corps of Commissionaires was on June 2nd. Being on the Executive Committee

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[40] J. L. Charles, "Permafrost Aspects of Hudson Bay Railroad," American Society of Civil Engineers, Soil Mechanics and Foundations Division Journal, LXXXV (December 1959).

gave me association with "Old Soldiers" and an interest apart from railway matters!

At Optic Lake on the 4th July, Stan Williams and I discussed commencement of track laying and ballasting as far as Grass River and progress as Mannix completed the roadway. Skeleton track was laid into Chisel Lake by December 2nd. Ballasting was completed after the spring break-up, 1960, and, on September 2nd, I had the privilege of driving the "Last Spike" ... made of zinc. And H.B.M. & S. hosted a dinner to mark the arrival of ore from Chisel Lake to Flin Flon.

This branch was extended from Chisel Lake during 1962/63 to another H.B.M. & S. mine at Stall Lake, and in 1966/67 to Osborne Lake, 71 miles from Optic Lake. The centre of this field is Snow Lake, a very pleasant town. Much of the line is located on solid rock and the excavated rock was built into embankments on muskegs; in fact, no effort was made to avoid solid rock excavation. This resulted in minimal maintenance of way.

Eldon Dolphin had proved to be a capable young administrator, so when an opening came for a division engineer with the operating department at Prince Albert, I recommended him; and he progressed to his present position, Manager CN Tower at Toronto (1975). The resident engineers were also placed with opportunities for progress.

## A Law Suit

The short extension to Stall Lake brought about the only law suit I have been involved in with a contractor. This was distasteful to me.

Lucas tendered marginal unit prices. I personally warned him and advised him he could withdraw if he wished, but he confirmed his bid and was awarded the contract for grading, etc., much of it solid rock. He then sublet the drilling and blasting to Corbett who alleged he lost a considerable sum and sued the C.N.R.

Corbett put his case in the hands of one of the most reputable law firms in Winnipeg; they based it on fraud -- that the Railway fraudulently led the contractor to believe there would be a greater quantity of rock excavation than actually resulted. It was true that the final measurement of rock was less than the estimate, based on

observations during the location survey as customary before the right-of-way was cleared.

Elliott Macdonald, C.N. Solicitor, conducted our defence. I was his principal witness and was closely cross-examined, but the claimant's counsel was unable to substantiate his case. The judgement was in favour of C.N. with costs against Corbett, who appealed and again lost. I was sorry for him; a decent fellow who took on a job at a price far too low. There was no bitterness between us.

I had been tutored that an engineer's position, between owner and contractor, was to ensure the work be completed to specifications and at the same time co-operate with the contractor and give him any legitimate 'break' in his operations -- work for a profit. I endeavoured to follow this principle throughout my career.

## To Lake St. Joseph, Ontario

Concurrently with keeping in touch with the Chisel Lake project, Steep Rock Iron Mines again took my attention. We had extended the spurs from Atikokan, requiring heavy solid rock excavation and a very high embankment to function as a dam and railway on precarious foundation. Dr. Hardy, University of Alberta, and Dr. Casagrande, world-renowned soils expert, were called in. This structure was named "Fairweather Dam". It reduced the otherwise longer distance to Caland plant. First train of iron ore from there was despatched 3rd May 1960.[41]

During the Caland ceremony, discussion arose about surveying a railway location to Steep Rock's property at Lake St. Joseph, north of Savant Lake station on CN mainline, between Sioux Lookout and Armstrong. 'Pop' Fotheringham said he would send his Beechcraft to pick me up at Winnipeg for general reconnaissance.

My diary reads, "May 10th, took off 13:15k for Fowler, thence at low level along possible railway route to Sanjo Mine site, south shore of Lake St. Joseph, then back to Fowler and easterly to Savant Lake, thence northerly to Sanjo and westerly along the south shore of Lake

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[41]Caland leased part of Steep Rock property and developed 'C' ore body at the East Arm.

St. Joseph. Returned to Allanwater Subdivision, then to Sioux Lookout and Winnipeg -- 5 hours 30 mins." ... in time for dinner. An experienced engineer can observe much in so short a time. It was indeed an enjoyable afternoon, as nature was breaking into life after winter slumber, over terrain of rock hills and lakes; waterfowl had returned and pussy willow buds were opening.

Good friend, Neil Armstrong of Spartan Air Service, Ottawa, arranged for a helicopter, en route to Calgary, to stop off at Savant Lake for my use for a detailed examination to Sanjo. Pilot Bill Smith and mechanic George arrived May 16th and changed the undercarriage to floats. We took off in the afternoon for test flight and during the next three days actual flying time was 21 hours, 20 minutes.

Arrangements for aerial photography were convenient too. Kenting Aviation, Toronto, had a B17 with camera at Fort William.

Charles Plank moved from his beautiful camp site at Reed Lake to Savant Lake, 1st August, to establish ground controls for photogrammetry. A passable trail near our route simplified this project, so field work was completed early in October. When maps were received, the proposed location was projected and costs for construction estimated, but nothing further was done as Steep Rock was not in position to proceed to bring Sanjo into production. However, presently in 1975, interest is being revived.

## Offshoots

In the years since Chisel Lake, the Planks have often been reminiscent of their decision to leave East Africa -- drastic political changes were in the offing, such as we are now witnessing against Whites; their introduction to Canada, north of The Pas; and how they fell in love with camp at Reed Lake.

Their cook, a Metis girl, was excellent but once in a while she would request leave for family affairs. Mrs. Plank would jump right in to keep everyone happy; quite a contrast to having houseboys in Uganda. However, Margaret has said, "I cried when we had to go from Reed Lake."

I must relate one incident I will always remember and appreciate. At The Pas, waiting with my grandsons, Bruce and Gordon, for a Lamb

plane for a hop to Reed Lake, Tom, the famed head of the firm, whom I was privileged to know well, took the boys to a new Otter moored to his wharf and then gave me a very sincere lecture on taking great care with boys in a canoe. He emphasized this by relating the tragedy of a grandfather who drowned, together with two boys, in a northern lake. I took it to heart; no one had more right to give such advice than kind Tom Lamb, who devoted his life to the development of our Northlands, as recognized by the award of Honorary LL.D. from the University of Manitoba.

Part of my holidays for 1960 were profitably employed in response to a request from Dr. G. M. Zarzycki, Vice-President, Canadian Aero, to make a preliminary survey for extension of the Quebec Cartier Mining Company railway from Gagnonville to Mt. Wright and a branch to Mt. Reid.

I left Winnipeg for Montreal 26th July, then by Quebec Air to Baie Comeau and Gagnonville, where we called on R. C. Temps, Chief Engineer, Q.C.M.C. From there we went by Beaver to Fire Lake for accommodation at the camp of diamond drillers.

Breakfast was good -- long white loaves, baked in camp, and beans -- typically Quebec.

A small helicopter was assigned for reconnaissance. The distance to Mt. Wright, a prominent landmark, with surface showings of iron ore, was just over 100 miles, and to Mt. Reid another 20 miles, through quite interesting, entirely undeveloped, country, mostly rock and muskeg, also some massive eskers of sand and gravel. It was said the lakes abounded with trout but we had no time to wet a line.

The evening before our departure, George Zarzycki gave a dinner to mine officials and their ladies ... quite a posh affair. I was somewhat surprised, but nevertheless had a hearty laugh, at one or two of the speeches. One story was, "On a small island there were two lonely trees until a small seedling sprang up. The older trees were puzzled as to what the new-comer might be, so they called in Woody Woodpecker for consultation. When Woody had investigated, he looked up and said, 'that is the best piece of aspen I have had for some time'."

A Significant Period

Wabush Controversy

Mid-July 1960, Mr. Fairweather, retired Vice-President of R. & D., advised me by phone that he was retained for the Wabush Mining Company to present its case coming up before the Board of Transport Commissioners with respect to freight rates on the Q.N.S. & L. Railway to Sept Isles.

He proposed to put forward a supposition that a competitive line could be constructed and operated with rates less than asked by Q.N.S. & L. This was to be based on a projected location which he requested me to undertake.

As there was little intention of locating for actual construction, this did not appeal to me. It was the subject of several phone discussions and, early in October, representatives of Pickands Mather Company of Cleveland called on me at Winnipeg. They offered $200.00 per day and all expenses and said they might be able to obtain authority for up to $250.00; fair pickings during 1960! But I declined and, from what I have heard, the case was not all pleasant. However, I appreciated Mr. Fairweather's thought of me.

## 12. LIBERIA MINING COMPANY RAILWAY

Dr. Zarzycki wished to expand Canadian Aero Service's scope from photography, mapping and geological studies, to embrace industrial development projects, but he had no one experienced in railways. He therefore suggested that perhaps I would advise him.

The Liberia Mining Company, producing iron at Bomi Hills, was about to develop a new mine farther inland by Mano River, the boundary between Liberia and Sierra Leone. A railway of about 53 miles would be required to transport ore to Bomi Hills, thence to the Atlantic Coast near Monrovia. George was keen to secure a contract for location. I obtained authority from C.N. to take part during holiday time due to me.

Saturday morning, 3rd January 1959, George and I took off by T.C.A. from Montreal for New York. We had lunch while waiting to board Pan Am for Robertsfield. George stood a drink so I thought I should reciprocate, but George said, "No, Les, it's all on the house." I replied, "OK, carry on!" Every expense was paid for me throughout, even some extra tropical clothing.

Before heading across the Atlantic, there was a stop at Boston, then dinner was served ... first class with all the trimmings. I woke up early during a brief stop at the Azores, then on to Lisbon for a break to stretch in bright sunshine; flowers were in bloom, smartly-attired families were taking Sunday morning strolls.

The Straits between Spain and Africa were quickly crossed to be confronted with the Spanish Sahara;[42] the desolate expanse of sand caused contemplation of what it might be like if a failure forced a landing. Touch-down at Dakar, capital of Senegal (French) was about tea time; this was Africa in all its blaze of colour. Smartly-uniformed police eyed transients closely. Visible off shore was the forebidding island where, in slave trade days, pitiful humans from the interior were held in dungeons waiting dreadful conditions sailing to America.

We reboarded for the final leg, and another sumptuous dinner, to Robertsfield. It was 21 o'clock and, of course, close to the Equator, it was dark. Stepping out in Canadian clothing, the heat

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[42] Recent discoveries of valuable potash have caused rivalry about ownership of this territory.

was intense. There had been no opportunity to change into tropical gear.

Passage through immigration and customs was slow, typical of equatorial regions; and it was disturbing to have to give up one's passport, to be held by the police until departure was approved.

Liberia was established by a group of 300 North American freed slaves, led by a missionary. They landed on the swampy, fever-infested shore one hundred and fifty years ago and fought the native Africans and disease. The few survivors set up the first Black Republic and their descendants are the ruling class -- very autocratic, too, maintaining strict control.

Next morning, freshened and in light apparel, we had a short flight to the capital city, Monrovia, to be met and driven on a fair, gravel-surfaced road, passing through colorful native villages, to the mine headquarters at Bomi Hills. We were made at home in a comfortable bungalow not far from the staff central dining quarters. To a stranger it was noticeable that electric bulbs burned in all clothes cupboards; to counter high humidity.

It was a spacious layout, all very tidy and clean. No wrappings from candy bars, etc. lay around. The senior officials' residencies were on individually-selected sites, well landscaped and apart; each with its own driveway. Other employees were appropriately housed in attractive bungalows with ample gardens. Separated, but not too far away, native common labour lived in compounds of concrete or brick huts.

The method of mining was by open pit, producing iron ore excavated with diesel shovels, bulldozers and trucks; a characteristic layer of red dust pervaded the area.

Most of the professionals and some technicians were from U.S.A., although a number of the latter were from Holland and Denmark, strangely at a lower wage scale for similar works. Africans, with normal education, performed routine office duties, operated dozers and drove trucks.

The railway superintendent was from the southern States, where I would judge he had been an assistant. He maintained and operated his metre gauge line, 42 miles, Bomi Hill to the Coast, with high efficiency, tidy as could be. Only one man, the locomotive engineer,

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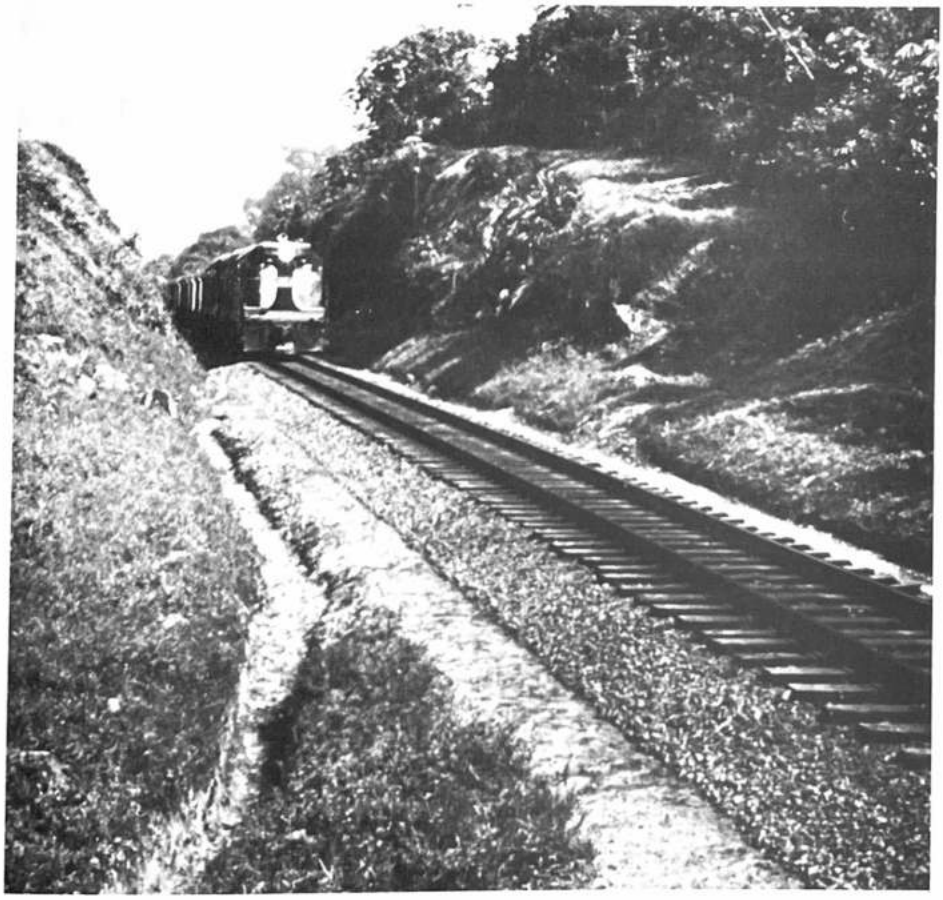

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Geologists' camp near Mano River, and the Liberia Mining Company railway transporting iron ore from Bomi Hill to Monrovia, January 1959. J.L.C. Photo.

on each train. There was no caboose, just a native boy riding the last car of each unit train, loaded with iron ore for export to Europe.

We were conducted around the yards, shops and despatchers' office, etc. Then we were shown the point proposed for turn-off towards Mano River.

George chartered a Piper Tri-Pacer for reconnaissance. The terrain was rolling hills, of the so-called Bie Mountains, heavily timbered and dense jungle undergrowth -- typical rain forest. There was no road beyond Bomi Hills into the interior. Native villages of bamboo and palm frond huts were linked with footpaths; these villages were amazingly clean. Women swept, with home-made brooms of twigs, between the huts daily or more often and they spent much time washing clothes, children and themselves at nearby water holes, enjoying life, so it appeared.

Initial reconnaissance indicated that the turn-off point from the existing railway could be four miles closer to Bomi Hills than contemplated. I spotted a little pass through the hills, opening a way to ascend the valley of Little Maheh River. This reduced the length of line to be constructed by three miles.

The Vice-President, senior local official, viewed it with much displeasure as the line ran along the toe of the knoll his 'baronial' home was situated on. In fact, when walking by, the butler came out with a fine police dog to indicate I was intruding. The location, however, affecting a substantial saving, was upheld when referred to the company president in New York.

Three rivers, Mafa, Lofa and Eonja, crossed the route. We made close studies, on foot and by boat, to select bridge sites; and also walked nearly all of the 53 miles to Mano River, always with a native boy just ahead to look out for snakes. This was impressed on us and to be generally careful. One had to barge through the underbrush unless it was slashed with machetes. When returning to camp, a fellow noticed a scratch on my arm. I said, "That's nothing," but was told, "Maybe so in Canada, but here different, go to the first-aid and have it dressed."

Except for monkeys, there was little wild life to be seen -- crocodiles, a diminutive type of hippo, small deer, the great hornbill and other colorful birds; snakes were there but they slithered

off unless surprised; then they were dangerous. Habitants of forests see man before man spots them.

Mine geologists had a camp adjacent to a bumpy narrow landing strip hewn by hand from the jungle near Mano River. We were invited to share their fare. Each person had an individual small tent with cot; very comfortable. In the mornings the cookee awakened the occupant and served a coffee eye-opener. The cook was first-rate. He had been chef in the top hotel of Monrovia but bent his elbow too frequently, so was banished to the wild, as often happens in Canada. With the sudden end of daylight, nocturnal creatures became active to enliven the jungle.

During hundreds of years, the environment and culture had progressed but little for the natives about Mano River. They were friendly, courteous and exhibited skill in building an office, open-sided shelter, for the geologists and making comfortable rattan chairs.

Giant trees with immense butts were felled, literally worried down, with the crudest of axes and the stumps patiently burned. I remarked on this to the chief geologist; why not power chain saws? He laughed and said, "I even tried to show them how to use hand cross-cut saws, sharpened and set the teeth and left them for a little while, then returned to be dismayed by seeing them hammering out the set of the teeth to be flat."

Our route crossed an area of diamond diggings guarded by the Liberian Frontier Force, by whom we were challenged and escorted to the commandant. It was early morning, so he came out from bed and detailed a barefooted soldier-policeman, with an old rifle which did not appear to have been cleaned for some time, to escort us in the restricted area.

Diamonds were found by diggers with picks and shovels at depths of five or six feet. I was about to take some close-up photos but was cautioned not to do so, as one might be accused of being involved in smuggling.

All went well. Our escort appreciated some of our lunch and reported us back to the guard house. The commandant was smartly uniformed, sitting with one of his comely wives and quite affable.

I delineated strips along the route to be photographed and

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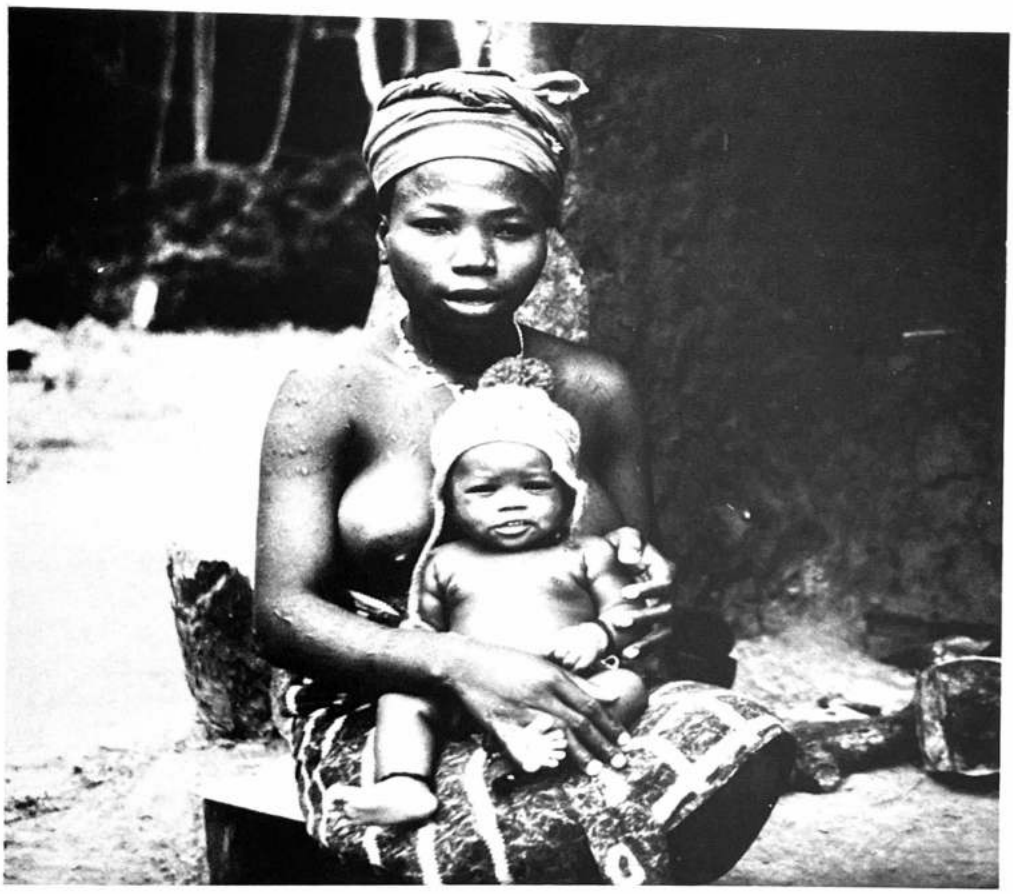

By the Mano River - border between Liberia and Sierra Leone - landing strip hewn by hand, somewhat bumpy. A young native mother and baby sitting by her fireplace, tribal insignia adorns her right arm. J.L.C. Jan. 1959.

George made arrangements. Atmospheric conditions were not too favourable, infra-red film had to be used. By then a survey party arrived from Ottawa to establish ground controls for mapping and we prepared to leave.

Our last night was memorable at a small, but first-class, hotel, with the Atlantic surf breaking against the grounds. It was unsafe for swimming because of undertow and sharks, but there was a good pool with salt water and dining facilities alongside. A red sunset, with fishermen in dug-out canoes sailing home, gave way to the moon ... an entrancing setting.

George is a connoisseur of good wine and gourmet food, so I was usually content to go along with his selection. This evening it was excellent. I remarked, "George, we are pretty extravagant." He replied, "Don't worry, Les, I know what it is to have been really hungry, so am going to drink and eat whenever there is a chance." George, a Pole, had been under communist control before getting out to Switzerland and Canada. One could not have a better travelling companion and professional associate.

Next day, 19th January, we checked out from Monrovia and drove 50 miles through the Firestone Rubber plantation to Robertsfield and took off by Air France at 18:30k. Looking down, the native cooking fires twinkled in the dark. At Dakar we separated. George went to negotiate a contract in Morocco.

In the morning, I was at Paris to change for Dusseldorf and Rhienberg to pay respects to memories of John where his earthly body rests with thousands of airmen comrades in the British Commonwealth Cemetery. It is beautifully tended, but it was a dreary overcast winter day. I believe it was as well that Helena was not with me. It would have been especially distressing for her.

During a stopover for two days in England, I visited my niece, Priscilla, and her husband, Charles Rose, in London and drove to my sister, Doris, and her husband (Baker) at Chichester, whom I had not seen for thirty years ... what changes. Then, by Comet Jet, with excellent first-class service, to Montreal and T.C.A. home to Winnipeg.

## 13. GREAT SLAVE LAKE RAILWAY

Mid-summer, 1957, interest in studies on extraction of oil from Alberta bituminous sands, by Royalite at Mildred Lake, north of Fort McMurray, came to the stage of considering extension of the Northern Alberta Railways.

It would appear that potential traffic would be inward movement of construction and plant equipment which would almost cease when the plant would go into production, and outward shipment of oil would be by pipeline. Therefore, investment for a railway did not appear attractive, unless it might be commencement of a line to Pine Point Mine at the south shore of Great Slave Lake, a major project I had dreamed about ... a railway into the Northwest Territories. Approval was granted for an aerial reconnaissance.

### Exploration and Trade

The historical route of the fur traders from York Factory, at Hudson Bay, into the Northwest was southerly to Norway House, near Lake Winnipeg, thence north-westerly by the Saskatchewan River, or overland by ox-cart, to the height of land between the Churchill and Athabasca Rivers to Waterways, the confluence with the Clearwater River with access to Lake Athabasca and by the Rapids of the Drowned to Great Slave Lake and the Mackenzie River to the Arctic Ocean, as travelled by Sir Alexander Mackenzie, Sir John Franklin, Capt. Back and the fur trade brigades.

The first modification of the annual trade journeys was by construction of the Canadian Northern Railway line at Edmonton, in 1905, and a branch to Athabasca Landing where goods were transferred from rail to water transport above a series of rapids, which were avoided when the Edmonton British Columbia and Dunvegan, now N.A.R., arrived at Waterways. Now our vision was for another long step forward by construction to Great Slave Lake and direct entrance to the giant Mackenzie River. There were three possible routes to be studied.

### Waterways Northerly

Laboratory and test installations to solve the difficulty to release oil from the vast beds of sand were being conducted at Bitumen, conveniently accessible by boat on the Athabasca River. The proposed plant site, Mildred Lake, was on the west side so the

river would have to be bridged. Fortunately, there was a site with limestone foundation one mile north of Fort McMurray.

Beyond, the line would be roughly parallel to the river, through sand dunes and sparse timber, until faced with crossing the mighty Peace River, 2000 ft. wide, near Peace Point, where warring Indian tribes got together and called a halt to killing one another. Thence by the west bank of Slave River through the Wood Buffalo Park, with herds totalling up to 16,000 of the majestic animals ranging in the wild, to Fort Smith, the territorial capital.

Between Fort Smith and Pine Point there are vast areas of swamp and muskeg, the nesting habitat of the endangered migratory whooping cranes.

Returning to Smith by light helicopter one evening, we noticed some Indians dressing a buffalo. Being curious, we landed to look on, but made no remarks. The hunters thought they were caught red-handed poaching, until we broke the silence to relieve them and enquire, "Did it take much bringing down?" "Yes! Five .303 bullets." Yet it was only a young bull -- prime meat.

Next morning, I met the Park Superintendent and had a talk about his care, without mentioning the poachers. He said his main concern was that animals were wounded with rifles without enough punch, and not recovered. Also, he continued, "We harvest a number of beasts each year. At first we shot with .303's, now we use .375 magnums and restrict it to expert rangers."

Licences are granted to sportsmen to kill one bull. It is very very expensive; several thousands of dollars for guides, transport, air fares and air freight of the carcass. One brought to Winnipeg, by a Chicago hotel proprietor, to be mounted whole, must have set him back by the time the animal stood in his lobby.

Wood buffaloes are a strain apart from those of the Prairies. They are amazingly fast, with tail high, when stirred by a helicopter or light plane -- quite exhilarating and a lot cheaper than a hunting safari.

Except for a deposit of gypsum and some timber about the Peace River, no potential sources of intermediate traffic were discernible on this route.

Great Slave Lake Railway

Roma Northerly

The westerly branch of the N.A.R. crosses the wide, deep spectacular valley of Peace River at prosperous Peace River town, almost a city, where there is a carved cedar monument of legendary "Twelve Foot Davis", said to have made a fortune by staking a strip, 12 ft. wide, between two mining claims. He is also credited with having been a very generous, open-hearted old-timer.

Railway gradients to descend to the elevation of the bridge and ascend northerly are 2.2 per cent and maintenance is heavy; therefore, turn-off towards Great Slave Lake is near Roma, on the plateau north of the river.

Not far away, two miles up river where the Smoky flows in, is a stone cairn with bronze plaque commemorating Sir Alexander Mackenzie's winter camp site while he waited for spring break-up to start his dash to the Pacific Coast, near Bella Coola, 1793.

Spring break-up recalls an annual lottery; the owner of the ticket showing the closest time to the actual second the ice in the Peace moves, is the winner. This is established in a novel way -- an old outhouse, one or two holer, is placed on the ice; when it moves is the official time of break-up. Peace River is not a dull town.

The Mackenzie Highway was built northerly during World War II to Hay River at Great Slave Lake, to provide direct connection between the N.A.R. and the head of Mackenzie River and down it to Norman Wells to put American Army Engineers in position to construct an oil pipeline to the Pacific Coast.

The south, 225 miles of the highway, ran through good potential agricultural land; settlers moved in and the towns of Manning, North Star, Hotchkiss, Keg River and High Level sprang up and prospered. New-comers could seek advice at the Experimental Farm, which had been in operation for forty years at Fort Vermillion by the Peace, east of Keg River.

At Meander River, Mile 225, there is a distinct change of character to a northern type of terrain with spruce instead of poplar and there are extensive muskegs. Local Indians do not use horses for travel and hunting as in the south. The town of Hay River is Mile 377 where the river discharges, after plunging over

a limestone escarpment at Alexandra Falls, 105 feet, and Lousie Falls, 67 feet, into Great Slave Lake.

The railway route is in the same general location, at no great distance away from the highway. There was one formidable obstacle, the wide and deep valley of Meikle River, Mile 175, with extremely unstable slopes and active landslides.

Easterly from Mile 350, a 55-mile branch line runs to Pine Point Mine and town.

Discovery of mineral at Pine Point was made by 'Overlanders' during the 'Rush' to Klondike, 1898. They noticed Indians had lead net sinkers and were shown exposed surface mineral. Claims were staked but dropped. It was not until 1930 that the Consolidated Mining & Smelting Company became seriously interested and proved up the deposit.

On my initial reconnaissance, August 1957, I called on C.M. & S. Manager at Yellowknife and was received cordially. His mine engineer, Joe Scarborough, volunteered to give me a conducted tour of Pine Point. In the light craft I had chartered from Fort McMurray, it was a long hop across the width of open water to Dawson Landing, the nearest point to the mine. The lone resident, caretaker 'Dolly' met us, with a pick-up, to drive along the trail through dwarf jack pine to his neat shack, to spend the night as his guest. Of course, we had a crock for lonely 'Dolly', but apart from that, we did not sleep well for worrying whether a strong wind might take our little craft off-shore. However, in the morning, we found it safe and sound. Joe then escorted the pilot and me to the original discovery post where almost pure lead glistened on the surface. After that we saw recent workings and plant buildings, all closed.

Dolly drove us back to our plane but then a real problem arose. Dolly was thirsty and he insisted we should take him to Yellowknife for dental care -- a spree. However, after much diplomacy, we took off leaving Dolly and his little dog dejected on the beach.

From Fort St. John (P.G.E. Rly.), North-Easterly

The Provincial Government of British Columbia suggested an alternative railway route, from the Pacific Great Eastern, near Fort St. John, north-easterly through Keg River, thence to Hay River and Pine Point Mine, to funnel traffic to Squamish and Vancouver.

Beaton River valley, deep, wide and treacherous in every respect, as described in Murray Hill's reports on the proposed Peace River Outlet, 1925/28, would have to be crossed. Otherwise there were no serious obstacles, except the direction of the line towards Vancouver was entirely impractical with respect to economy of operation.

## Analysis of Controlling Features

Reconnaissance to establish the most practical route for this project was my individual responsibility. With an excellent pilot, I covered all three routes in a Cessna and made many landings for spot examinations of soils, etc.; also drove the Mackenzie Highway and other roads and walked critical sections from July 26 to August 14, 1957. Level of the Peace River was high, carrying washed-out trees, roots and all. It called for careful landing and taking-off.

The suggestion from B.C. was obviously impracticable. The other routes -- north from Waterways, and from Roma -- necessitated close study. The lengths were nearly the same and costs would appear similar, also operating distances on ore haul from Pine Point were nearly the same.

In my opinion, greater benefit to the public, in particular to agriculturists, would be derived through a railway northerly from Roma. However, controversy developed. Mr. Roger Graham, Vice-President, C.N.R. at Edmonton, said city businessmen considered the Waterways line should be adopted, and B.C. wished to present a brief. A Royal Commission sat at Edmonton, 28 to 30 September 1959, to hear presentations from all concerned. Mr. Wilbur Boyd was counsel for the C.N.R., and I gave evidence with coloured slides. On November 23rd, the Commissioner's ruling in favour of Roma northerly was announced and Mr. Norman MacMillan, Executive Vice-President, C.N.R., phoned me to proceed with staking the location on the ground for construction.

## Location Survey

Preparations for aerial photography and mapping were made, and I sent for Charles Plank to survey ground controls. I contracted with Spartan to supply a small Bell helicopter to meet me at Peace River, December 5th, to review the route and note specific controlling

features. Aimé Leroux, the pilot, was tops. We had many productive and enjoyable hours flying in sunny cold conditions until the 13th, when the temperature modified, causing serious icing. Aimé took off for Grande Prairie to garage his copter during the Christmas-New Year break. I followed him on the highway -- a sheet of glass -- to pick him up, and his mechanic, to continue to Edmonton. Not over-cautious, I skidded into the ditch, but without serious consequences. When we resumed on the way, however, Aimé said, "Major, for Pete's sake, slow down! I gave you better care flying!" Aimé was a good fellow; we had more happy days together in the New Year.

Vic Cox was, in my judgement, the best young engineer to take charge of the field parties under my overall direction, providing he would be willing to move from Toronto and, if so, that Alton Johnston, System Chief Engineer, would approve. This was agreed to and Vic reported to me at Peace River after New Year holiday, 1961. He was very fortunate to rent a comfortable house, facing directly onto the river rolling by ... an ideal situation for wife and two children. And Vic set up a base office in town.

There were vast muskegs between Hay River and Pine Point; summer surface travel was impractical except plodding on foot, so it was obvious this section should be located when frozen for ease of movement by tractors.

Ken Beauchamp, with a Bombardier, Aimé with his helicopter and I teamed to mark an access trail for Plank and party. Aimé and I would spot the shortest distance of treed ground between adjacent open areas, then hover there until Ken took a bearing to start a bee-line to us; then we would move ahead to the next point and repeat the procedure. This was an efficient method to break a direct trail with a minimum of cutting. Tractor operators with bulldozers and camp trailers followed.[43]

There were few good axemen to be hired for cutting survey lines, so two D6 caterpillar tractors with dozers and operators were introduced, giving excellent results, working in tandem as directed ahead by the transitman. Good line was cut and snow was ploughed clear too, so well that there was no need for chainmen and other party members to wear snow-shoes. Also, there was a good trail for Bombardiers to

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[43]Ken had been on the lines to Chisel Lake and to Thompson; a first-class bushman with mechanical aptitude for tractors and boats.

transport men from their comfortable trailers, with hot and cold water and first-class cooking and dining facilities, to work and return each evening. This was a great advance over slogging through deep snow and life in tents, especially when temperatures dropped to 50° or 60°F below zero; however, that is preferable to 20° below together with strong wind. As late as April 13th, minus 30° was registered.

An amusing incident happened at Hay River. Vic Cox was in the hotel lobby when Charles Plank arrived by bus, via the Mackenzie Highway. Plank enquired for 'Major' Charles, in his customary Oxford tones ... to Vic, not knowing Plank, such a voice was unexpected, especially there. Afterwards Vic said, "I thought he was the bishop of the Arctic!"

Plank's party averaged four miles of line, six days each week, from Pine Point out to the mainline and southerly, until spring break-up. Another party, under Vincent, made good progress from Roma northerly.

Soils tests, especially depth of muskegs, were also made during winter by Gagnier & Stewart contractors of Hay River. Gagnier, a powerful barrel-chested Quebecer, had arrived in the early days on foot with a pack on his back -- a real frontiersman -- to prosper, in contrast to some others I met there, for example, a bank manager who remarked, "I've a year to go!" as though serving a sentence with one thought ... get out as soon as time was up; they do little for the North.

Dr. Solandt and Don Purvis arrived at Hay River 9th September to go over the railway location. One overnight stop at High Level, Dr. Solandt informed me that his department, R. & D., considered that I was setting the maximum rate of controlling gradient, 0.60 per cent compensated, more favourable than justified, and it would result in high capital cost with respect to potential traffic. I substantiated my reasons, particularly that I was of the opinion that the G.S.L.R. was a trunk line and would eventually be extended down the Mackenzie River valley to Inuvik and the Arctic Sea. After Dr. Solandt returned to Montreal, he sent me a copy of a memo he wrote to Mr. Gordon, upholding my judgement. I deeply appreciated his thoughtfulness.

As mentioned earlier, the Meikle River valley presented a serious challenge descent -- to cross on a steel viaduct 170 feet high, 2127 feet long -- and to ascend the north slope without exceeding the



Great Slave Lake Railway of the Canadian National System,
constructed 1962 to 1964.
Steel viaduct 2, 127 ft. long, 170 ft. high across the Meikle River.

J.L. C. Photo.

ruling gradient I set myself. There were so many active and potential landslides that I decided to call in R. Thurber & Associates, soils specialists of Victoria; they were not able to recommend a preferable site but gave valuable advice in design of construction of grading excavations and embankments, 1,700,000 cu. yds., to counter further movement. Together with the steel structure, it was a very costly crossing but has given no unusual maintenance problems.

## Construction

The first item, of course, was clearing the right-of-way. Tenders were advertised for by sections. The first advertisement appeared December 20, 1961, and was followed by requests for bids on grading, culverts and timber bridges; steel structures were specific items.

Supervising engineers, each with two instrumentmen, etc. were set up to lay out and check the building of 20 miles of line. The staff had to be expanded rapidly. Although portable buildings were provided and all camp sites were quite accessible by highway, there was a reluctance by many to accept the positions open to them.

Charles Plank, Evan Scales, Mike Fussell, Jim Kenyon, Bill Lewall, Gordon Russell and A. Monahan were the principal supervisors on grading; and Noel Smith and Ruben Staffannson on bridges; also Lloyd Hostland was appointed assistant to Vic Cox. Conditions were not easy for them as most of the prices tendered were comparatively low for work in the North. Some small contractors from the Prairies bid in and got into difficulties. Two substantial firms, who should have known better, quoted low prices too.

The upshot was much unpleasant wrangling and litigation, especially for Vic as I had gradually turned over construction to him when other projects took my attention. He made excellent presentations in the Railways' interests.

Track laying and ballasting were done as usual by CN forces with W. H. (Pat) McIlroy in charge and Ralph Welch supplied the bulk of the labour. One especially capable foreman and all-round leader was John Chypyha, employed after retirement; I am grievous to say he died on the job.

The line was completed without exceeding my original estimate of $75,000,000, plus contingencies, $11,000,000, based on lone observation from a light aircraft and some surface investigations. At times it appeared that such a practice might land me in a horrible flop, but experience with luck held. If one had requested time and money for detailed pre-engineering, it may have jeopardized commencement, so one accepted the responsibility.

Operation was opened November 1, 1964, and has indeed been a boom to development towards Great Slave Lake. More agricultural land has been put into cultivation and for grazing as far north as Meander River, latitude 59 degrees. High Level has become a heavy grain shipping station and tonnage from Pine Point Mine has exceeded expectations; and northward shipments for transfer to Mackenzie River tug and barge services have effected considerable savings on freight as compared with the circuitous route from Waterways, involving the long portage around the Slave River rapids at Fort Smith.[44]

My dreams wandered again to other potential projects in the Northlands.

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[44]J. L. Charles, "Railways March Northward," Canadian Geographical Journal, LXII (January, 1961), 2 - 21; "The Great Slave Lake Railway," Engineering Journal, XLVIII (May, 1965), 15 - 19.

## 14. PAN AMERICAN RAILWAY CONGRESS

In response to an invitation to present a paper, "The Great Slave Lake Railway"[45] at the Pan American Railway Congress, I left Winnipeg October 18, 1963 for Mexico City and next day attended the opening ceremony by the President of Mexico.

Sessions were held daily through the week, attended by delegates from most of the important railway systems of the North and Latin Americas. Canadian Pacific was represented by Mr. Frame, Vice-President, at Winnipeg, and Mr. John Burriger, President of the Pittsburgh & Lake Erie Railway headed the delegates from the United States. John was a keen student of railway history; I had had the pleasure of entertaining him and his family on our train going to Prince Rupert a year or two before this Congress.

The sessions were very enlightening on all of railway matters -- location, construction, maintenance, operation and finance. Movies of sections of Mexican railways illustrated mountain construction not surpassed anywhere and that they were equipped with most up-to-date maintenance-of-way machines.

Naturally, there were relative social functions. I found time to tour this beautiful city of wide boulevards and contrasting buildings, some typically Spanish and others high-rise and modern, with especially designed foundations against destruction by earthquakes.

Although 7,000 ft. above sea level, the site is a reclaimed marsh, a basin surrounded by mountains. Many of the old structures, notably the Opera House, are sinking year by year. Some of the former condition remains, known as the Xochimilco Floating Gardens, where boatmen conduct tours in colourful boats, a type of punt, through the canals for views of exotic flowers. On Sundays the scene is gay with family picnics and musicians serenading them.

Another Sunday attraction is elite horsemen displaying their thoroughbred mounts on the swathe of designated boulevards. One party -- school boy, father and grandfather of aristocratic mien, with spirited steeds -- was especially noticeable. Their accoutrements are dazzling exhibits of saddlers' and silversmiths' crafts. The riders, of course, are no less lavishly turned out; their enormous hats are amazing.

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[45] Charles, "The Great Slave Lake Railway," 15 - 19.

Bullfights, one at least, should be witnessed. The ring, with rows and rows of seats on high, smartly dressed spectators, elaborately adorned matadors, picadors, assistants, horses with padded protection and angry black bulls form an exciting spectacle, all watched over by alert, well-armed, tough riot squads.

The atmosphere is tense. My seat gave me a close-up view; on my left was a cultured lady and her elegantly dressed little daughter. The excitable Latin temperament -- "Kill him!" -- was obvious, even in the child of tender age and she was versed in the finesse of the matadors, either applauding or booing them. Six dead bulls were dragged away, by brightly caparisoned mules, to be doled to the poor -- tough meat I imagine.

Huge mosaic designs are to be admired, particularly on the walls of the University. And a tour outside the city took me to the Pyramids of the Sun and the Moon -- what a way of life the Indians had before the Spaniards destroyed it!

The wide gap between 'haves' and have nots' may be disturbing to strangers. Homes of the wealthy are securely fenced and locked with a dangerous looking dog patrolling within; whereas the destitute sit on sidewalks, at the entrance to churches, hoping for alms.

Departure for Vancouver was at 7:00k, rather early for champagne; however, as there was no other passenger in the first-class section the stewardesses had little to do and plied me with goodies. If I had accepted everything, it would have been questionable on arrival whether it was Vancouver or Timbuktu ... a fitting climax for a buckshee trip to Mexico.

15. RECONNAISSANCE TO CONTWOYTO LAKE, N.W.T.

In my Winnipeg office, 25 September 1962, I received a phone call from Alton Johnston advising that International Nickel enquired about the possibility of extension of rail service from the G.S.L.R., northerly to its property at Contwoyto Lake, near the Arctic Circle.

It appeared that he did not appreciate it would very soon be freeze-up there, but I did not say anything and left in the evening for Edmonton to arrange to charter a Beaver to be ready to take off when I arrived at Fort Smith next noon for study of the terrain easterly from Pine Point, across the Slave River, which presented a very difficult bridging exercise, with under clearance for shipping and relative long high approaches on low ground with high water table.

Thence along the rugged rock formation to the east end of Great Slave Lake by Fort Resolution to Fort Reliance for the night at D.O.T. weather station, near the historic remains of stone fireplaces built by Capt. Back's expedition for winter quarters before exploring the river bearing his name to the Arctic Ocean at Chantry Inlet and return, 1834 ... an amazing achievement.

At daybreak we took off northerly by the Lockhart River and Artillery Lake, in view of the part dug-out hut where the eccentric English traveller, Hornby,who prided being able to live 'off the country', starved to death, together with his young nephew and a friend, when the annual caribou migration did not materialize through his barren camp ground.

We landed on Pellatt Lake to call at an Inuit camp. The only available fuel in this inhospitable region was twigs of dwarf willows and birch, gathered and stored with great patient necessity. This was an inland band, the dauntless "People of the Deer" described by Farley Mowat. Only women, children and a few dogs were in camp. The men were on a prospecting trip, lead by the regional game warden who instructed them. Previous expeditions had borne fruit; claims were staked and options sold to a mining company.

This dedicated officer, in efforts to reduce the annual kill of caribou for skins to make huts, and to improve living conditions, designed a very practical sectional building of plywood at Yellow-knife, for delivery by freight plane, to be paid for with funds gained in claim staking. These buildings are featured especially to withstand the terrific winds common to the 'barrens'.

At least one hundred of the dwindling caribou; and, fish are

necessary to sustain one family a year. The once immense numbers of these animals may be comprehended by viewing the deeply rutted trails converging to fords. There was one barren land grizzly hide being stretched for tanning at Pellatt Lake; this species is in danger of extinction.

It was not much farther to Contwoyto Lake; Inco camp and scars of work with bulldozers were clearly visible at the north end. We landed and found all deserted ahead of approaching winter. Strong wind required all the pilot's experience to contend with it.

After observing the topography with respect to a possible railway approach and yard, we took off to head along the valley of Burnside River, across the Arctic Circle to saltwater at Bathurst Inlet. The community consisted of a few Inuits living in makeshift summer huts near the Hudson Bay Company post on a low hill. The sea and brown hills across the bay under soft sunlight of late afternoon, 27th September, formed an impressive scene and wish that I had talent to paint it.

The manager and his wife were surprised and hospitable, for they seldom had visitors from outside. We purchased a piece or two of native sculpture direct from the artist at reasonable prices and took coloured photos; one of a young mother of the Arctic with babe, in contrast to the study of the young mother and baby by Mano River near the Equator, 1959.

We dallied a little too long for us to make the D.O.T. station on an island in Contwoyto Lake for accommodation and fuel before nightfall. When we first circled, no light was visible, but on the second round I spotted a feeble ray and, in response to buzzing, the weathermen emerged with lights to show the shore and signal us safely down. After greetings, they took us indoors for supper and a companionable evening, then to bed. These isolated stations are manned by two or three operators, one of whom is relieved in rotation every three months. Visitors, if at all sociable, are always welcome.

Refuelling next morning, the weather was chilly with a brisk wind. Ice was forming along the shore and snow falling -- winter was at hand. We lost no time in getting away.

Our return southward was by an alternative route farther west by Orkney Lake and Wecho River to Fort Rae, where we gassed. Thence

(59) The Canadian Shield west of Hudson Bay, a vast region of bare rock and lakes J.L.C. Photo.

across the Mackenzie, nearly one mile wide, above Fort Providence to connect with G.S.L.R. at Enterprise, 30 miles south of Hay River. The charter was terminated and pilot Hong Mar, from China, a first-class man, sped home to Fort Smith.

Vic Cox was at Hay River. We inspected progress of construction, driving and walking, making overnight stops at Fussell's and Plank's camps, through to Peace River.

On return to Winnipeg I prepared a comprehensive comparison of the two possible routes reconnoitred. The projected distances for a railway route from Pine Point to Inco claims was 515 miles; and the alternative from Enterprise, 485 miles, with a crossing of the Mackenzie. I concluded my report by suggesting a much wider study -- from Lynn Lake north-westerly to Contwoyto Lake and beyond to Coppermine at the shore of Coronation Gulf. I was delighted when approval came.

## Lynn Lake - Coppermine

July 30, 1963, I again took off from Fort Smith but, by reason of a limited budget, had to be content with a Cessna 180. The pilot, however, was Ernie Boffa, thoroughly versed in the North. We were away with a light camp outfit, to set out gas caches at strategic points. The first was at Flett Lake where we camped for two nights while working easterly to the site of Old Fort Hall, once operated by Revillon Frères, on the sandy bank of the lake; fireweed was a blaze of colour. Kicking about the ruins I found a child's skate, with the runner made of a file set into a skilfully carved block of birch, and wondered whether there had been happy family life at this far-off trading post so many years ago.

We proceeded north-westerly across Dubwant River to cache gas at Sandy Lake; and next day flew from Flett Lake back to Dubwant River, thence southerly of Wholdaia Lake to land on Vermette Lake. There I dug test holes in a ridge of first-class gravel free of frost to some depth but, in an adjacent muskeg, permafrost was struck at barely one foot from the surface.

After boiling the kettle, we went on by Artillery Lake and Lockhart River, where we caught excellent speckled trout for supper in camp near Fort Reliance. From there we worked over an expanse of gravel and sand hills up to 200 ft. high, to land on

Reconnaissance to Contwoyto Lake, N.W.T.

Mosquito Lake during a heavy rain storm. The water was so rough that it was with extreme exertion we held the plane and tied it down, with meagre hold fasts, on the barren shore. Close by, permafrost, in form of clear ice, was exposed with arctic cotton blooming alongside.

August 5th gale force wind and waves delayed taking off. It was late evening before we got away to Hanbury Falls, passing over many lakes with rocky shores which might puncture the plane pontoons. Calm after the storm, with rays of setting sun on the lakes and bare rock reflecting the underside of the wings, was rapturous. About ten o'clock we spotted a narrow sand beach at Kirk Lake for a safe mooring, pitched our little tent on the tundra and heated beans and coffee. Mosquitoes and blackflies were at rest, all was peaceful with afterglow of sunset in the northwest and full moon opposite, 23:45k. We turned in, content with life not many are privileged to experience.

Next day we traversed over the Heywood Hills to Back River where a C.M. & S. prospecting party was camped, then to Muskox Lake and Thelon River where it flows through a long reach with sandy banks on its course to Baker Lake. About turn to the westward, we made our way to Contwoyto Lake for fuel and renewed acquaintances. The close of an eventful day, including finding a herd of muskox ... so well camouflaged with their shaggy brown hair blending with the Arctic landscape.

After a night with the helpful fellows at D.O.T., we reviewed Inco's camp and workings at the north end of the lake and set course across the Arctic Circle, north-westerly over the beautiful shades of blue-green of Takiyuak Lake and high rugged rock hills to Coppermine River, and viewed Bloody Falls, reminiscent of Samuel Hearne's description of shock and disgust of the wanton massacre in a surprise attack by Indian Chief Matonabe on an Eskimo band, to the last feeble old woman, peacefully fishing at the Falls.

Coppermine settlement, a few miles east of the river's outflow into Coronation Gulf, consists of a Hudson Bay store, R.C.M.P. and D.O.T. stations, Church Missions, Eskimo Co-operative Store and native dwellings between the shore and rock hills. Also, reference my notes, "seasonal camps on damp soggy ground, with native families crowded in makeshift shelters and unsanitary conditions. Carcasses of seals left about after being skinned and dogs tethered between the shelters. Weather, bright sunshine, noon temperature 50°F, so odours of blubber, fish and dogs were high; on the other hand the

residents presented a clean, tidy, well-dressed appearance."

It would have been interesting to have had more time at Coppermine but the price of gas was very high and daily costs for the Cessna were mounting; so not to exceed $5,000. authorized, it behoved me to keep moving. We left in the afternoon, August 7th, alongside Coppermine River, Dismal Lake and Teshierpi Mt. to the east shore of Great Bear Lake -- very rugged, with long indentations resembling the Pacific Coast in miniature. We landed at Hornby Bay to catch a trout, first cast, for a snack.

Then we called at Port Radium, uranium plant being closed, en route to Yellowknife, arriving at dusk to terminate the charter. Eight days flying from early morning to late evening and camping with Ernie. We observed an immense expanse of uninhabitated country of rock, sand, gravel and muskeg in the condition of permafrost and lakes, mostly north of the tree line ... an enlightening and enjoyable exercise. It was a pleasure to wish this mature pilot and good companion 'Godspeed', but I was reluctant to part.

Flight to Hay River was by regular schedule. Vic was there so we inspected construction progress on the G.S.L.R. before I proceeded home. My plan to complete reconnaissance across the 'Shield' was to charter a plane at Lynn Lake to save flying hours from Fort Smith.

After two weeks assembling notes and drafting maps, I left by Trans Air for The Pas to meet Stan Williams for inspection of extension of track from Chisel Lake to Stall Lake and then by track car to Lynn Lake, 29th August. Eldon Brown, President of Sherritt-Gordon, invited me to lunch. I took off in the afternoon with pilot Jim Hoglander to Brochet at the north end of Reindeer Lake and on to Fort Smith, then by Kasmere Lake to the south end of Nueltin Lake for accommodation at Treeline Lodge, operated by Parson Airways. There were no guests, but a jolly woman cook was there to serve delicious grayling, the sporty little fish of swift streams, bacon and hotcakes with ample butter and maple syrup. It was fall, such a glorious season in the North. Night temperatures cool the activities of winged pests. The boatman took me on the lake to view the surrounding terrain.

On the 13th we flew northerly by Windy and Hogarth Lakes, viewed extensive sand hills and eskers, to Ennadai D.O.T. station by noon and were invited to lunch. Afterwards, we took off easterly by Watterson Lake where caribou were ranging, to Kognak River at the

outflow from Mountain Lake; Selco prospectors were camped there. We attempted to land, but it was too windy with waves breaking on the jagged rock shore. We returned by White Mountain, over quite rugged rock country, to "Treeline" for more grayling, bacon and hotcakes, but were given johnny-cakes -- just as delicious!

The last day of August was the last field day of this invigorating and informative exercise, by reviewing the country south-westerly by Kasmere Lake and the big bend of Cochrane River to Lynn Lake to terminate the charter. Jim's base was at Flin Flon, so he took me along to connect with a bus to The Pas and train for Winnipeg and to write my report, dated November 1963.

Between Churchill and Coppermine, the direct air distance is 900 miles. My travels totaled 5,500 miles. Projections of two railway routes from the end of track at Lynn Lake to the north end of Contwoyto Lake are approximately 850 miles and 840 miles, respectively, and a conjectural cost of $206,000,000 -- now, with inflation, probably double that.

There would appear to be no extraordinary difficulties to be contended with to construct a railway there -- provided permafrost was handled with respect -- except for inaccessibility, winter darkness, low temperatures and violent storms, also summer pests.

Deposits of sand and gravel not too far apart would, of course, be helpful. Mr. J. W. Tyrrell, in his book, "Across the Sub-Arctic of Canada", 1893, describes, "Certain remarkable physical features, in the shape of great 'eskers' or high sand ridges were also observed in this locality (Wholdaia Lake). They were composed of clear sand and gravel, were sixty to seventy feet in height, trended in a north-easterly and south-westerly direction, quite narrow on the top, and so level and uniform they might well be taken to be the remains of embankments of ancient railways."

Mining would appear to be the only industry which may justify expenditure for extension of railways northward, excepting perhaps in the Mackenzie River valley.

My report, 30th November 1963, concluded with, "until the mining industry proves up sources of potential heavy traffic, at one or more definite locations, it would be impractical to submit more than the observations obtained during the general aerial reconnaissance, described in this report and in the report dated

Reconnaissance to Contwoyto Lake, N.W.T.

31st December, 1962."

For historical reading, Samuel Hearne's narrative, "A Journey to the Northern Ocean",[46] Churchill to Coppermine, 1769/72, compels attention. He must have walked thousands of miles; much of the time near starvation, pestered with flies in summer and against perishing winter blizzards. One area he described, "A jumble of rocks, which we could not avoid without going greatly out of our way. It was with the utmost difficulty that we crossed it without broken limbs." I believe this to have been in the vicinity of Kasba Lake.

It was 1792 that Sir Alexander Mackenzie explored the river bearing his name, but he did not record going inland. The Sir John Franklin Royal Navy expedition, 1819/22, charted the Coppermine River and some distance both east and west along the shore of Coronation Gulf against terrible circumstances, perhaps cannibalism by one of his party, reference, "A Journey to the Shores of the Polar Sea."[47] Another classic about the North is Capt. Back's (formerly Franklin's lieutenant), recording his own exploit, "Narrative of the Arctic Land Expedition to the Mouth of Great Fish River (Back River) and Along the Shores of the Arctic Ocean, 1833/35."[48]

In 1893, Joseph Burr Tyrrell and James William Tyrrell, of the Geological Survey of Canada, surveyed from Lake Athabasca, by Selwyn and Wholdaia Lakes to the Dubwant River, thence to its confluence with the Thelon River and on to Baker Lake and Chesterfield Inlet to reach Churchill. They, and party, were the first white men to traverse this region since Samuel Hearne, one hundred years before.

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[46] Samuel Hearne, A Journey from Prince of Wales's Fort in Hudson's Bay to the Northern Ocean undertaken for the Discovery of Coppermines, a North-West Passage, et cetera in the Years 1769-1772 (London: A. Strahan and T. Cadell, 1795). Reprint editions are available, A Journey to the Northern Ocean, ed. by Richard Glover (Toronto: Macmillan, 1958) and A Journey from Prince of Wales's Fort in Hudson's Bay to the Northern Ocean ... (Edmonton: Hurtig, 1971).

[47] Sir John Franklin, Narrative of a Journey to the Shores of the Polar Sea in the Years 1819, 20, 21 and 22 (London: J. Murray, 1823).

[48] George Back, Narrative of the Arctic Land Expedition to the Mouth of the Great Fish River and Along the Shores of the Arctic Ocean in the Years 1833, 1834 and 1835 (London: J. Murray, 1836).

If they could return, they would find that very few changes have occurred north of the 'tree line' or, more precisely, north of a line westerly from Churchill through Lynn Lake, Brochet, Lac LaRonge, Fort Smith and Yellowknife, except, of course, at Coppermine.

I expect, however, continued search will expose hidden mineral wealth to support viable railway construction and operation in the 'Region of the Canadian Shield West of Hudson Bay'.

## To see Pingos

While in the Great Slave Lake region, I made a trip by tug and barge from Hay River, across the lake and down the Mackenzie by the historical river bank settlements, Fort Simpson and others, to Inuvik. It was informative and enjoyable, in spite of sleeping in shifts when the bunk owner was on duty; however, the cook was a good fellow.

There was no darkness. I took two coloured photos showing brief sunset at 23:30k and turned about for one of the moon over the wide river, rolling along towards the Arctic Sea.

Inuvik, an instant town, was built to replace native Aklavik where permafrost caused much trouble; however, in spite of the huge expenditure, the older settlement has not become a ghost.

The striking features of the new town are the airport, built with a thick layer of blasted rock and gravel on the permafrost; the utilators, longitudinal wooden boxes, on piles, housing water, heat and sewer lines; the circular Roman Catholic Church, resembling an igloo; high prices; and, that the civil servants with special northern allowances, appear to look after themselves in housing with all amenities, better than the natives they are assigned, by Ottawa bureaucracy, to assist.

I particularly wished to see the strange Arctic phenomenon 'Pingos', mounds of clear ice, with bases up to 500 ft. in diameter and heights to 150 ft., with covering of scrub, etc. 1400 pingos have been counted on aerial photos of the flats east of the Mackenzie Delta.[49]

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[49] J. Ross Mackay, "Arctic Landforms," in The Unbelievable Land, ed. by I. Norman Smith (Ottawa: Queen's Printer, 1964), 60-63.

(60)

The Coppermine River, Bloody Falls where Indians massacred Eskimo, as chronicled by Samuel Hearne in his "Journey to the Northern Ocean, 1769/72". Photo by J.L.C. during reconnaissance through the N.W.T. 1963/64.

(61)

Samuel Hearne described this formation as "A jumble of rocks, which we could not avoid without going greatly out of our way. It was with the utmost difficulty that we crossed it without broken limbs."

(62)

Reconnaissance across the Northwest Territories 1963 and 1964, many eskers were observed resembling abandoned road or railway embankments. Sand and gravel of these formations will be beneficial for construction. Photo during a stormy day, by J.L.C.

(63)

Pingos - conical mounds of solid clear ice up to 150 feet high - there are some fourteen hundred of these strange formations, relative to permafrost, in the lowlands easterly of the MacKenzie R. Delta.

(64)

Mosquito Lake N.W.T.-a clump of spruce battles to survive in this wind swept land; a lens of clear ice - permafrost - is exposed and 'Arctic Cotton' blooms nearby. J.L.C. August 1963. Lower photo - Creek upper right flows from small lakes at the summit of Goz Pass, elevation 4050'. The surrounding Selwyn Mountains are up to 9750' above sea level. Crest Exploration 1964.

(65)

Reconnaissance to Contwoyto Lake, N.W.T.

Two young travellers and I chartered a Cessna to observe the region of pingos and the community of Tuktoyaktuk, about the most northerly habitation of mainland Canada; beyond permanent pack ice is visible on Beaufort Sea.

The native people are progressive; they have formed a co-operative to dress animal skins of the north and manufacture artistically-designed garments for sale in the south, at remunerative prices.

16. AN ODD JOB

To survey a location for a railway, which everyone concerned hoped would not be constructed, would appear to be an odd job; nevertheless, it was called for. From time to time, both Liberals and Conservatives at Ottawa, had promised that the Canada Gulf Terminal Railway would be extended from Matane along the south shore of the Gulf of St. Lawrence to St. Anne des Monts, 58 miles.

Canadian National was requested during 1962 to undertake this survey and prepare an estimate of cost for construction. It fell to my lot to give advice to N. J. Nickerson, Construction Engineer of the Atlantic Region. There were all manner of obstacles -- cliffs, rivers and other rough topographical features, highways, power lines, towns and villages, each with a church and cemetery, and land surveyed in long strips fronting on the Gulf, also the local language, entirely French, to be puzzled with.

Periodical inspections necessitated long flights from Winnipeg, through Montreal, to Moncton and much auto travel to become familiar with the country the proposed railway, if built, would serve. I found it interesting to come in close contact with French-speaking Canadians along the 'South Shore' and their mode of life -- farming, fishing and logging -- also the historical aspects.

Cap-Chat, almost a vertical cliff with flashing lighthouse high above the sea, together with the town and river, were indeed challenges to discover a practical route by them. It was but one of a number of problems.

Excellent motels and restaurants, where salmon and lobsters were cooked with local recipes, made this a memorable exercise; and there were amusing incidents -- The proprietress of an out-of-the-way café, passing the time of day with Nick and me said, "We hear that two English-speaking engineers with a party of students are surveying this way. They will be given a tough time."

However, this 'odd job' was completed. No doubt the politicians were happy with our report indicating the long discussed project could be put to rest, without damage to their interests.

It would have been shameful to have disturbed the old ladies, and some young ones, rocking away on their verandahs, and to disrupt the tranquil life of this peaceful countryside which had no need for additional transport facilities.

17. WENNER-GREN EPISODE

It has been said that Dr. Axel Wenner-Gren of Sweden commenced his amazing career as a common salesman. He became a multi-millionaire tycoon with world-wide interests which he spread to Northern British Columbia by entering into agreement with the Provincial Government. To construct a railway to turn off from the Pacific Great Eastern at, or about, Summit Lake, near Prince George, to run northerly to the boundary with Yukon Territory, some 700 miles; in return he would be granted valuable timber and mineral concessions; thus the Pacific Northern Railway Company was incorporated.

The 'Doctor' turned to Colonel Bingham, Consulting Engineer of New York, to establish the location. Although the Colonel was widely experienced on inter-urban transportation, he knew little about railroading through undeveloped country. Consequently, he sought help from Lt. Col. H. H. (Harry) Minshall, consultant in partnership with Leslie H. Smith at Vancouver. Although specialists in design of bridges, they too knew little of railway location, so Harry phoned me about the situation. It was obvious that he wished to submit a proposal. Always interested in new projects, particularly in mountain territory, I agreed to become associated to the extent C.N. duties would permit me to do so.

Harry said a lump sum bid was called for, an extremely risky proposition with so many unknowns, especially weather conditions affecting operation of aircraft and photography in mountain territory. Adverse weather could close in without warning for days on end to pile up expenses. However, Harry was keen. George Smith and I gave him data on costs and time factors for land survey controls and railways, respectively, to enable him to take a calculated risk.[50]

The Rocky Mountain Trench route towards Alaska, as surveyed by the U.S. Army Engineers for a military railway in 1942, and described in chapter 2, was certainly the most favourable route but now there was serious talk of developing hydro-electric power at Rocky Mt. Canyon which would back up the Peace River to Finlay Forks, also to the south and north in the Parsnip and Finlay Rivers. The Trench route, therefore, was not practical. Also, it was the opinion of some that there were more possibilities for minerals and timber farther west.

The alternative, in my opinion, would be to turn off from the P.G.E.

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[50] H. H. Minshall, "Prince George to the Yukon via the PNR," Canadian Counsulting Engineer, II (September, 1960), 34-43.

near Summit Lake, thence westerly to Fort St. James to enter the valley northerly by Stuart, Takla and Bear Lakes, thence across the Skeena River and by Damdochox Lake to ascend the Nass River to its summit, then descend by the Klappen River to cross the Stikine and Tanzilla rivers for ascent to the head of Teslin River, thence by Gladys Lake to the north border of B.C. and be in a position, if required in the future, to continue through the Yukon to Alaska. I discussed this with Colonel Bingham during a brief meeting at Winnipeg airport.

Minshall, Disney, Cameron,[51] the cook, cookee and I met at Prince, Friday evening 5th June. Next day Harry and I drove to Summit Lake to select a point of switch. In the afternoon we all drove to Fort St. James and registered at Douglas Lodge amidst great timber on the shore of Stuart Lake. It was decided to set up our base there. A helicopter arrived before dark.

Harry believed in professional style and showed it by his contract with caterers to board us in the field at a price of $15.00 per man daily; very high at the time for just furnishing the cook, cookee, utensils and rations, f.o.b. Vancouver. They did an excellent job. The cook was from the first German submarine sunk in 1939. He was a prisoner in Canada until hostilities ceased and he was repatriated, then emigrated at the first opportunity to B.C. He was a good fellow, we liked him. But his life was not all smooth ... while he was away, another German whom he had befriended, seduced his wife.

Sunday, my diary notes, "Reconnaissance by helicopter Fort St. James south-easterly to south end of Great Beaver Lake and from the Fort northerly to Pinchi Creek; weather good." 7th June 1959.

Fort St. James, named for Sir James Douglas, was the original capital of B.C. Its economy is dependent on saw mills and tourism. Nearby, at Pinchi, cinnabar was mined for the production of mercury, vital to our forces after sources in Spain were cut off.

Some rugged rock cliffs on the east shore of Stuart Lake were detoured by going inland to Pinchi and back to the main valley at Trembleur Lake and on to Takla Landing. We moved there and pitched camp near the

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[51] Mr. H. Disney was Col. Bingham's representative from New York; he was at sea, just looked on, nevertheless a decent fellow. J. Cameron was a land surveyor in the employ of Minshall & Smith.

H.B.C. post on the east bank of the long beautiful lake cradled between snow-capped peaks. Our cook served the first of his fare, prepared on a simple camp fire. It was delicious and he never slipped throughout the job.

Going through a narrow canyon on the Klappan, the tip of one main rotor blade struck a small poplar branch hanging over the river. When we returned to camp the mechanic recognized defect, a small dent, and grounded us for repairs. So little throws a helicopter blade off balance.

Two Mounties were on patrol in their cabin cruiser at Takla. They invited us to go fishing while our mechanic worked to put us in business again. We had fair sport and a pleasant time, also there was no request for show of licences -- we had none. Police far from the crowd have more to attend to.

Les Smith arrived and we reconnoitred by Bear Lake to the confluence of the Sustat and Skeena Rivers and returned to Bear Lake to find camp had been moved there. The 'Husky' we had for freighting had been used. Although it was 22k, supper was cheerfully served to us.

Bear Lake, the summit between Takla waters and the Skeena, is interesting with respect to spawning salmon; fish which fight their passage up from Vancouver via the Fraser, almost meet exhausted salmon from Prince Rupert, via the Skeena.

June 12th I had my first view of Damdochox Lake, a virtual jewel. The pilot and I were alone, so we landed on Stephen Peak, 5940 feet, where the snow had been blown to leave a clear shape of a man; it was a thrill to swoop steeply, from such a promontory, until straightening to level flight. We found camp moved again.

Harry attended to all logistics, especially placing gas caches, and left me free to concentrate on the specific engineering which I preferred to do alone, without distractions ... as learned from old-timers Silcox, Gunn and Hill.

There were two possible routes over the summit -- one at the head of the Skeena and the other at the head of the Nass. Examination of both and careful checking of the elevations, showed the Nass to be the lower, hence less rise and fall, so it was adopted.

Weather caused some delays, so we were camped at Damdochox for

three nights. Game was plentiful and seldom disturbed. We saw grizzly bear, moose, caribou, goat, beaver, swans, geese and ptarmigan, all in one day. I spotted a Canada goose sitting on her eggs in a nest on the top of a beaver house at elevation 3870 feet; this is quite uncommon. There were so many moose, I stopped counting them.

I was aware that the Grand Canyon of the Stikine was not far ahead -- narrow, with near vertical rock walls up to 1500 ft. high, for a length of 35 miles, to Telegraph Creek. One low level turbulent flight through it was enough to convince me, and the pilot too, that it was no place for location of a railway and a detour should be found.

This was accomplished by crossing the Stikine a few miles upstream and surmounting the Gnat Summit, then crossing the Tanzilla River near Dease Lake where there was a high-class hunting lodge. The proprietor's wife told me a heartening story about my old friend Skook Davidson. "He was passing on the trail with the longest pack train I have seen, about 150 horses. My young son ran out to see the show. Skook lifted him up for a little ride and said to the boy, 'when you are old enough, I will bring you a horse.' Some years later, the promise was fulfilled with a superb animal."

We camped at Ealue Lake while studying this critical area. The cook was in his glory, catching pan-sized trout, before breakfast. He would shout, "roll out" and by the time I shaved and dressed, fish that swam the lake minutes earlier were sizzling on my plate. Goat were plentiful too, but we did not molest them.

On June 20th, I wrote in my diary, "Rain all last night, and this morning; clouds low in the valleys, flying impracticable. Husky still away at Prince Rupert for repairs. Worked on notes and maps until evening, then went with helicopter to proposed crossing of Stikine River; measured the gorge with range finder."

This was the only time we were nearly stranded without gas and not certain where we were. It was nearly dark, more circling would consume the little remaining fuel, so we landed on a prominence to scan the landscape. It was a bleak prospect, with snowy peaks all about us until I recognized a feature in the Klappan valley by which we set a course for camp during the final rays of sunset.

Between Tanzilla River and the Tuya there are very incompetent soils similar to the unstable fine-grained clay on the Kitimat line, but here there is no timber suitable for cross-logging.

Wenner-Gren Episode

Camp was at Cole Lake, a very poor site on low ground and again heavy rains, and nearby there was an expanse flooded by beaver dams. To investigate ground conditions I had the helicopter pilot land me and gave him instructions to pick me up at a certain point at 17k. He showed up but failed to see me and went off to return after circling and repeated this, then landed on the far side of wide open water. I decided that to make camp I would have to wade across and started to do so, until the water deepened so that I had to swim to reach the 'copter as the pilot was about to take off.

Of course, I was soaked and sloshed up to the tents. Harry, quite concerned, produced the one bottle of brandy he carried for emergency and said, "Are you all right, Les? Have a drink." I declined, remarking there was nothing to bother about, I often got as wet hunting ducks, to which Harry replied, "That's all right, but you are not as young as you were, I would like you to have a drink". -- "O.K., thank you." It gave me a pleasant inward glow.[52]

We continued northerly by the west side of Teslin River and Teslin Lake to the north end of Gladys Lake, our final camp site, and tied into the boundary between B.C. and Y.T., then assured the route could be continued ahead to Whitehorse.

The cook was moved from camp to camp in the 'Husky'. He lamented that he had seen no big game. Next evening this was changed. After supper the copter pilot and I took off. It was my habit to strap on a rusty old 30/30 rifle, but this evening I omitted to do so. As events developed, it was well I did. When we returned near midnight, almost light enough to read, we were surprised to see a young bull moose dead near the camp fire. The cook had seen a moose -- face to face. It had charged through the willows and he, the cook, had presence of mind to grab the loaded rifle to get in two or three well-aimed shots. Of course, he was delighted and with the help of the cookee, dressed it.

Next evening on the shore of Gladys Lake, we were treated to a gourmet dinner -- shrimp cocktails and fresh salad, by air from Vancouver, together with tender filet mignon of moose, with fresh vegetables and coffee, topped off with the emergency brandy ... what a dinner! As I mentioned, Harry ensured we had the best of fare.

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[52]Before embarking on our project, we agreed there would be no other liquor on the job.

Wenner-Gren Episode

To properly round off the project, I reconnoitred by Whitehorse, Lac Laberge to the Yukon River valley and down it to Carmacks, Minto and Selkirk to connect with the U.S. Army survey to Fairbanks, 1942; then returned to Gladys Lake, a very full day.

June 26th, I left Whitehorse by C.P.A. for Vancouver; arrived 17:30k. Les Smith met me and we worked on notes until midnight and, in the morning, I took T.C.A. for home, terminating three exciting weeks in the field.

Big George Smith, land surveyor with whom I walked through the virgin forest from Terrace to Kitimat, took a sub-contract from Minshall and Smith to establish ground controls; he too risked a lump sum. We met at one of his camps. I remarked on the hard-looking cook and frugal supplies. George was tough. He said, "All I want is something to make crap and energy."

August 10th -- Harry, George and I made a review of the summits of the Skeena and Nass. We left Vancouver, in the Husky, via the Coast for Fort St. James. Weather forced us into Ocean Falls for the night. Next morning it was still overcast but we got through, via Bella Coola to the 'Fort' and on to Bear Lake and next evening moved to Damdochox. Our helicopter arrived but in landing punctured one float seriously. This necessitated a run in the Husky via the Nass Valley, Meziadin Lake and Bear Pass to Stewart, on the Coast, to obtain patching and a load of gas. Further examination of the helicopter showed it to be unfit for flight in this remote rugged area, so we made the best of the situation by observing from the Husky at low levels, with inclement weather, over our proposed rail route, with a detour over the Grand Canyon of the Stikine, to Whitehorse, then by C.P.A. to Vancouver and I returned to Winnipeg, 19 August.

In spite of adverse weather and mechanical failures, it was a valuable trip. Bear Pass approaching Stewart is ice bound by a glacier and flying over Bowser Lake recalled the courage of Indian trapper-trader Gun-a-noot, who was accused of shooting a 'loud-mouthed' man who made gross remarks about the superior man's wife, in a bar at Hazelton.

Gun-a-noot retreated to the interior and held out, during summers and winters, against the best the 'law' and Pinkertons could send against him, until a friend persuaded him to face trial, resulting in acquittal.

Wenner-Gren Episode

The most amazing feature was that Gun-a-noot, being mercilessly hunted, fulfilled his father's dying wish to be buried by Bowser Lake. Gun-a-noot packed his father's body many miles through the rugged country for burial ... truly a loyal son and husband too.[53]

From time to time I informed senior C.N. officers about Provincial plans for railway routes in Northern B.C. and how they might affect our economy. At Montreal, 22 and 23 September, I conferred with Mr. Dingle, Dr. Solandt and other interested officers.

P.N.R. proposed route from Summit Lake to Damdochox was 290 miles. It was north of and more or less parallel to C.N.R. Prince George to Hazelton, 292 miles, in operation since 1914. The distance apart is but 130 miles. This is a glaring example of functionally duplicate lines which both C.P.R. and C.N.R. are petitioning to the Board of Transport Commissioners, at Ottawa, for authority to abandon.

There was no need for two lines in this area. Logs from north of Takla were rafted in summer and hauled over ice in winter to the saw-mills at Fort St. James and, as lumber, trucked to Vanderhoof on the C.N. for transport to markets.

The obvious alternative to construction of the P.N.R. for the first 290 miles, was build from Hazelton northerly to Damdochox, 122 miles, and a joint operating agreement easterly to Prince George, to affect saving capital cost to construct 168 miles through mountain terrain and annual maintenance of 290 miles.

I was authorized by C.N. to make a reconnaissance from Hazelton to Damdochox. As there would be two major bridges, I sent for Les Smith to join me. Immediately after completion of Royal Commission hearings on the G.S.L.R., I left Edmonton on Car 73 for Smithers. Les and pilot arrived with a Cessna.

While there it appeared advisable to view a wide range, from Smithers to Hazelton, thence northerly by the Kispiox valley into the Nass, over the summit, then south to Damdochox and Babiche Hill to Cut-off Mountain. Also to fly northerly from Kitwanga.

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[53] H. O'Hagan, "Man Who Stayed Invisible for Thirteen Years," Maclean's Magazine, LXXI (July 5, 1956), 20-21, 34-39.

Wenner-Gren Episode

About dinner time, Pete Cornwall arrived with a copter and we all moved to New Hazelton, with Car 73 for a base. Next morning I selected a bridge site to cross the Bulkley River canyon. Les, with assistance of Phil Eger, my secretary, triangualted the width; they wandered and just got in before dark. In the meantime, Pete and I made gas caches and set up a fly camp at Fred Wright Lake for the following night.

Our reconnaissance was across both the Kispiox and Skeena Rivers, two miles above the confluence with the Bulkley, a memorable landscape with glorious fall colours on the mountain slopes, capped with fresh snow. Then up to connect with the P.N.R. route. This cut-off would be entirely practical with a maximum gradient 1.00 per cent compensated.

On return to camp at Fred Wright Lake we found a visitor had been there. A grizzly bear had had fun with a tin of green paint left by 'Fisheries' people during the summer. It was pierced by claws and teeth, paint spread all about, on fresh snow; lucky the tent was not in shreds, 8th October.

After receipt of my report at Montreal, strong presentation was made in the National interests to the Provincial Government, at the highest level but it was not accepted. A policy had been adopted to ensure that the P.G.E., now B.C. Railway, would remain free from regulations of the Federal Board; and perhaps the Province was miffed by C.N.R.'s attitude when requested to consider a joint facilities agreement at Prince George. The result was another instance of personal pride and politics thwarting common sense.

As Les and I were in a convenient point to take off, Harry suggested he and Jack Anderson, pilot, would meet us with a Piper Apache, twin engined, to fly to Whitehorse then to Fairbanks, country Harry and Les had not seen. I readily agreed as this was an opportunity for me to view a route north from Terrace and round out my appreciation of all feasible railway routes northerly from C.N. line west of Prince George. We departed from Terrace at 13:30k, heading across the laver fields by Kitsumkalum Lake for the Nass and Bell Irving Rivers and crossed the Stikine at Telegraph Creek. We arrived at Whitehorse just at dusk.

From the Yukon capital city, we flew by Lake Laberge, with aside thoughts of Robert Service's poem, "Man from Tennessee', in part,

Wenner Gren Episode

"There are strange things done in the midnight sun
By men who moil for gold;
The Arctic trails have secret tales
That would make your blood run cold;
The Northern Lights have seen queer sights,
But the queerest they ever did see
Was the night on the marge of Lake Laberge
I cremated Sam McGee."[54]

to the Yukon River at Carmacks to connect with the U.S. Army survey just below its bridge site at Five Fingers Rapids; then by the White, Ladue and Tanana Rivers to Tanacross to land for gas; there we had difficulty starting the starboard engine, so it was a late arrival at Fairbanks.

While waiting for mechanical repairs, we walked about to see the facilities of the Alaska State Railway. We then took off to return via the Alaska Highway route passing beautiful Kluane Lake, freezing over, to Whitehorse and by C.P.A. to Vancouver. I went to M. & S. office to work until midnight and next morning worked another two hours before breakfast at Hotel Vancouver, to complete my report.

At the office I studied stereo pairs of photos and delineated strips to be mapped. Tom Price retired from C.P., a few years my senior, called in. I was delighted to meet him again. In the evening I left for Winnipeg.

This concluded all field work but there would be piles of photos and maps to be projected on in the office. For a start I quote, Saturday and Sunday, 17/18 October, "At Wpg, Les Smith arrived from Van. with first of contour maps of strips northerly from Summit Lake, worked with him projecting location, assisted by Jim Walker, Charlie Witcher, George McCracken and Phil Eger." During November, I left for Vancouver each Friday evening to project in Minshall & Smith's office Saturdays and Sundays. Les Smith set up two long tables and assigned two assistants to lay out maps for me to project on, going from table to table consecutively -- an efficient production line, one day 100 miles were achieved -- and be back in my office at Winnipeg Monday mornings.

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[54]Robert Service, "The Cremation of Sam McGee," Songs of a Sourdough (3d ed.; Toronto: Briggs, 1907), 35-40.

Wenner-Gren Episode

The length to the B.C.-Y.T. border was calculated to be 698 miles, maximum rate of gradient 1.75 per cent compensated, in relation to the P.G.E. It was an intensely interesting project.

Harry and Les were able to pay all their costs and have a moderate profit, which should have been substantially more if Col. Bingham had paid in Canadian funds, as Harry expected, instead of U.S. dollars, then at a lower rate of exchange.

Wenner-Gren died before his dream became reality; consequently the P.N.R. became defunct and B.C.R. is cautiously constructing northerly along the route as projected to Dease Lake. Track is laid to Takla Lake as at 1975.

18. INSURANCE REFUSED

During the fall of 1962, Mr. John Dryborough, Consulting Engineer, Newmont Mining Company, requested me to study the feasibility of a railway for transport of ore from Granduc Mine to Burroughs Bay on the Pacific Coast, north of Prince Rupert.

All set to go, then John phoned to say no insurance company would take a risk on account of my age, 70 years! Never mind! This assignment, although comparatively short, had a compelling call. The incident, however, caused me to realize that by the law of averages the terminal was not so far ahead.

Granduc Mine, basically copper, is under Leduc Glacier, 4000 ft. above sea level, in extremely mountainous terrain, near Stewart, B.C., and the obstructive Alaska Panhandle. Access was by chartered aircraft, other than by a few hardy prospectors, on foot.

Geologist Don Cannon, co-discoverer of the deposit, and I met at Vancouver, 27th November, not a good season to go into the Coast Mountains. We went by schedule flight to Prince Rupert for transfer to a Grumman Goose, for flight close to sea level through rain and snow to Stewart where a helicopter should be waiting. Inclement weather ruled out further travel, so it was overnight at Stewart, at the head of Portland Canal ... a town that had known better times.[55]

Severe storms continued through the night but subsided sufficiently to take off in the helicopter at 10k; however, visibility was very limited, at times nil. Don knew the country intimately to direct the pilot through tight spots, to land on the glacier, 2000 feet above Granduc Mine. The pilot would never have made it alone.

A jolly old Chinaman occupied a plywood shack, well anchored to the ice, where he served short order meals, padding about on the floor slippery with ice, and frost adorned the walls ... he was a gift from the Gods.

After a bite, visibility improved a little, to permit us to find Sawmill Camp and reconnoitre to Burroughs Bay, then return to the

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[55] Port traffic had declined seriously, the town had a run-down appearance. Now Stewart has surface access with the 'Outside' via connection with the Alaska Highway.

Insurance Refused

Sawmill by nightfall.

Snow continued through the night and next morning; notwithstanding, we took off along the Unuk River Valley but soon wet snow plastered the bubble and forced landing to remove the doors for vision, to continue to Burroughs Bay. The tide was out so we landed on the flat, then the snow stopped and sun broke through to present a glorious scene. A black wolf cautiously emerged from the timbered shore onto the pure white snow, stood to scan around ... a picture to delight an artist. Joe, the pilot, took a long shot, but missed. With one leap the target vanished. A high-powered rifle was carried at all times as precaution against grizzlies; one prospector had been mauled this Fall.

After examining the head of the Bay for a dock site, we made a close study of the Unuk River to the mine. This valley is confined between steep slopes, some precipitous, of the mountains, up to 5000 ft. high, with evidence of rock and snow slides. Midway, an area of lava from an extinct volcano was observed for a distance of five miles.

Exit from the mine would be through a tunnel eight miles long, to a portal at the head of the south branch of Unuk River, thence by the main river to the dock site, an estimated distance of 53.5 miles -- 27.5 miles in B.C. and 26.0 miles in Alaska.

Cost of construction, maintenance and operation would be comparatively high, especially as this proposed line would be isolated with no connection to the general railway system for interchange of equipment and, also, for diesel locomotives' periodical overhauls. Therefore, I recommended study of an alternative -- a heavy duty highway to the existing port at Stewart.

My last night was at the mine camp, built on the mountainside, with steep walks between offices, bunkhouses and cookhouses; no protruding paunches are seen there!

Departure was to be right after breakfast, but snow delayed this for two hours. Then the pilot said O.K. and dived from the glacier through light snow to the Leduc River and by the Chuman to tidewater. There I was dumped from the helicopter to wait for a Cessna to pick me up.

The weather cleared. Although alone with my pack, it was

glorious at the edge of the forest by the shore of the Pacific. It was not long until a float equipped plane arrived to take me to Ketchikan for transfer to a Grumman Goose, amphibious, to Annette Island airport for regular service to Seattle and Vancouver, all by 17:15k ... a grand day.

I was thankful for good health to take part in transport studies such as this.

19.

## YUKON IRON ORE

During 1962, Crest Exploration engaged Canadian Bechtel Ltd. to make a preliminary evaluation of an extensive jasper-hematite iron ore deposit recently discovered in a remote area near the confluence of Iron Creek with Snake River, close to the Yukon-Northwest Territories border, 80 miles south of the Arctic Circle.

Feasibility of marketing would depend to a large degree on the cost of transportation, obviously a railway to a Pacific Coast port for export. The main ranges of the Rockies and the Coast Range confronted this.

On the other hand, if it were feasible to market at steel mills about the Great Lakes, it would be more favourable for railway construction, via the Mackenzie River Valley, to connect with the northern terminus of Great Slave Lake Railway. Circumstances put this out.

The ill-conceived, for Canada, Alaska Panhandle severs the Yukon and Northern B.C. from ports north of Stewart. Therefore, agreement would have to be negotiated to permit rail operation through U.S. territory to transfer traffic to ocean shipping at an Alaskan port -- Skagway, Dyea or Haines.

Mr. M. P. Boyle, of Bechtel, requested me to make a study with him, to select the port and a railway location to it. I agreed and, as I would be on the G.S.L.R. early in September, that we would meet at Fort St. John to proceed by C.P.A. to Whitehorse.[56]

Without delay, we took off in a Beaver for Mayo and next day reconnoitred through Goz Pass to the Snake River and the mine site, mountainous, almost barren land with exposures of ore. Our return to Whitehorse was by an alternative route through Kelly Creek Canyon.

Overnight at Mayo, a grizzled old man returned from a successful prospecting trip. He displayed a pure nugget 3 inches across. There is, yet, gold in the creeks for hardy individualists to wash.

September 10th we scouted through the Chilkat Pass, the Coast Range, by aircraft and on the ground to Haines. The rapid descent from the summit to Haines eliminated this port. It was near midnight

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[56]Not long afterwards, Mike Boyle was killed, as passenger, during the crash of a light plane.

(66) 'Yukon Iron Ore' site at the confluence of Snake River and Iron Creek, near the border of Yukon Territory and the Northwest Territories. Crest Exploration photo.

when we looked around for a restaurant, all were closed, but persuasive Mike Boyle roused a lady, to dress and cook the three of us steaks for $5.00 each.

Haines is a picturesque town at the head of Chilkat Inlet; a few of the 1898 stampeders struggled over the formidable pass to the Klondike.

In the morning we arose to bright sunshine and made good use of it by flying along the coast to Juneau, the capital of Alaska, to obtain harbour charts, then to Dyea and Skagway and through the Chilkoot and White passes, respectively, to Lake Bennett; the two routes thousands of stampeders took, lured by dreams of Klondike Gold. We then returned via Carcross to Whitehorse, to connect with C.P.A. for Edmonton, ending the first of several reconnaissances to become thoroughly versed in the controlling features affecting this project.

The one hundred and ten mile railway, W.P.& Y., constructed in 1898 to 1900, against extreme difficulties -- the topography, solid rock, climate and transient labour -- was, of course, considered for the first leg from Skagway to Iron Creek. Its narrow gauge, 36 inches, extremely steep gradients and curvature showed that it had not the capacity required for operation of heavy unit trains of ore.

The remaining possible port site was Dyea at the head of Taiya Inlet, a few miles west of Skagway. From the interior, a railway approach to Dyea would be via the Chilkoot Pass, companion to White Pass. So abrupt is the descent that brakes would not safely hold heavy loads.

To reduce this to 1.90 per cent, the Coast Range would have to be penetrated by a tunnel 11 miles long, under Crater Lake, to emerge in Taiya Valley towards the head of the Inlet.

Six hundred and fifty acres were available for a railway yard, with deep water nearby, through Chatham Strait to the open Pacific.

Dyea was adopted for the proposed railway ocean terminal, a distance of 577 miles from Iron Creek Mine.

There was a period of 'marking time' except for conferences, until Crest Exploration, with its parent California Standard Oil, approached the Government of Canada to jointly undertake further study in an endeavour to find a means to reduce the estimated cost for

railway construction. This was approved and our Railway was commissioned to undertake it.

I was called to Montreal and Ottawa for conferences and, on 5 August 1964, went to Whitehorse to arrange for gas caches to be set out for operation of a helicopter as required for a comprehensive field study. At the same time, by auto, I furthered my knowledge of road access, southerly to Carcross, also northerly through Carmacks to Keno Hill Mine, near Mayo, and to Dawson City.

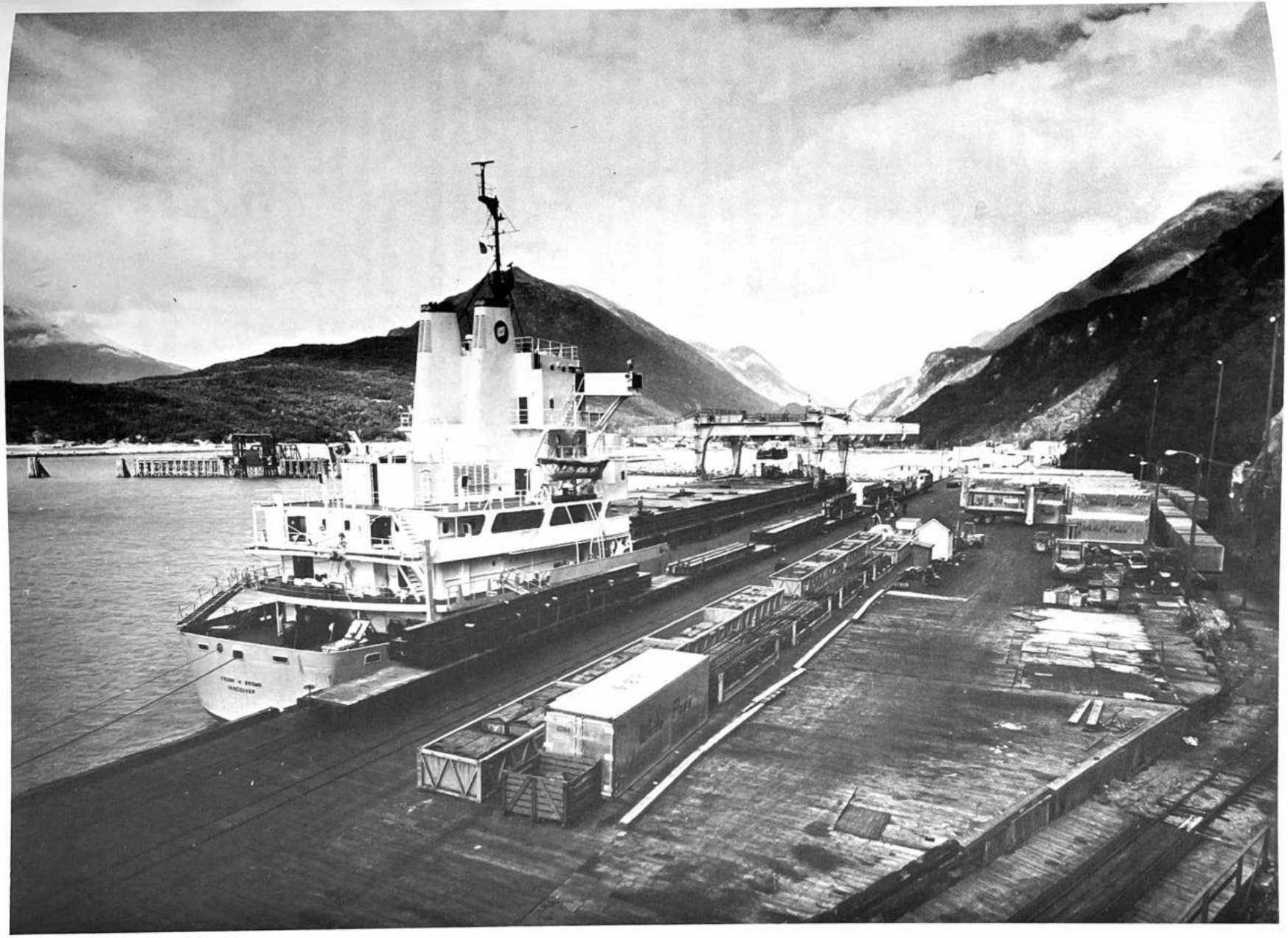
Country full of so much interesting history, as written about in verse by Robert Service and, recently, by Pierre Burton in 'Drifting Home'. At Whitehorse, the old log Anglican Church and a unique three-storey log shack are still functional, but it is sad to see the monarch sternwheelers, of the Yukon River heydays, pulled up and rotting on the bank near the W.P. and Y.R. station where they used to commence their run to Dawson. The Indian Cemetery is in contrast to the modern airport on the plateau above the city.

First-class hotels provide comfort and good fare. Colourful characters may be met in the lounges; one sourdough kept himself from thirst by betting that his powerful dog could lift the 'taker', prone, from the floor.

Crest assigned a young engineer, Bill Cook, and Nick, a camp handyman, to assist me. They arrived, with the Company's Boeing, on the eleventh and we moved to Iron Creek and worked outward to Dyea with aid of a copter making frequent landings. Together, with the pilot and mechanic, our party was five, with light camp equipment and a two-way radio against emergency.

At Iron Creek there is ample open area for railway terminal facilities. The route towards the Coast ascends the mountain slopes on the northwest side of Snake River to gain entry, by a tributary creek, to Goz Pass, elevation 4030 ft. There are two small lakes, indescribably blue mirrors reflecting snow of the adjacent mountains, white clouds and blue sky above, a scene of wild beauty far from normal travellers. The habitat of some of the most majestic bull moose and caribou I have seen and grizzlies ranged there too, as evidenced by a cache they had ripped to pieces.

The Pass opened to the Bonnet Plume and East Rackla Rivers and beyond to the expanse of Lake Kathleen with well-timbered shores and



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Skagway Alaska - the White Pass and Yukon railway and port facilities, this northern transportation complex was the first to introduce containerization.

full of lunker trout. We camped and worked from there for a few days. I enjoy fish three times a day but Fred Foster, the pilot, said, "Don't put any more of those damned things in front of me!"

Our route passed Keno Hill, to cross Stewart River, near Mayo and enter the Yukon River Valley at Minto. Downstream there was a striking bank of sand and gravel up to 100 ft. high, around a long sweeping bend, so smoothly sculptured by the current that it appeared to be mathematically precise, then Five Finger Rapids came into view.

At Carmacks we cut away from the Yukon, avoiding very adverse formations, to go by Fox Lake and rejoin the main waterway at Lake Laberge and on to Whitehorse.

Thence we travelled more or less parallel to the W.P. & Y to the head of Lake Bennett where the summertime tourist trains stop for lunch. As the staff had been particularly obliging and we had ample gas cached there, Fred gave the cook and summer student waitresses two at a time, a flip to see the beauty of their environment from above.

There we diverted from the historic railway, westerly of the deserted log church to the portal of the proposed tunnel, under Crater Lake, to emerge in the Taiya Valley for access to Dyea.

The summit of Chilkoot Pass is the border between B.C. and Alaska. There traces of the Northwest Mounted Police post hut may be discerned to elate pride in being Canadian. The Mounties watched over the safety of the 'Gold Rush' travellers and barred entry of Soapy Smith's gang who took toll from many who passed through Skagway and Dyea.

Looking southerly down the near precipitous slope, a mental picture may occur of the thousands, of all classes, some never before beyond a city, struggling up with heavy packs, several times, until all was at the top, to be examined by the Mountie on duty to ascertain that the respective owners had sufficient supplies before they were permitted to pass on by the shore of Crater Lake to Lake Bennett and await spring break-up for travel on the great waterway to Dawson.

The view over Taiya Valley to Chilkoot Inlet is breathtaking with the shades of blue-green salt water, foliage of coniferous

and deciduous trees, of stark rock on the mountain slopes and undefiled snow, white on the peaks.

## An Alternative

In endeavour to reduce the distance between Iron Creek and Dyea by about 30 miles, a route was reconnoitred via the Little Salmon and Kelly Creek Canyon. It would bypass Mayo, Elsa and Keno Hill mine without appreciable reduction in overall costs. Therefore, it was dropped.

## Analysis

Carrying maps and profiles of the projected location, and an estimate of cost for construction based on maximum gradient 1.00 per cent compensated against export traffic, I went to R. & D. at Montreal to confer with its specialists and others, particularly the system bridge engineers and officers with expertise on train operation.

Several programs were run on the train operation simulator to ascertain the best combination of car loadings, train tonnage and motive power, also distance between passing tracks, schedules and other factors in relation to estimate the annual cost to deliver 3,500,000 tons of ore to Dyea.

## Winter Conditions

Having noticed during the summer the paths of rock and snow slides from the mountains, across the projected railway route, it appeared provident to view conditions during winter, especially in the Snake Valley and Goz Pass.

Bill Cook and I met at Whitehorse and proceeded to Dawson City. I approached a local pilot, who had a Beaver, to fly us to the projected railway location at Mayo, thence through Goz Pass and Snake Valley to Iron Creek. The fellow eyed me as though he doubted whether he had heard right, and my wisdom, and said, "Why the devil didn't you come in summer?" I replied that I had done so, then he said, "If it is fifty below in the morning, will you wish to go?" ... "Yes!"

Yukon Iron Ore

Before daylight Bill and I drove to the airfield and found a mechanic warming up a Beaver. The pilot arrived and at sunrise we took off; the thermometer registered minus 50 degrees; the date was 17 February, 1965. As it was planned to make landings, snowshoes, eiderdowns and rations were taken as precaution against emergency. There was no wood, even for a meagre fire, in the Pass and upper part of Snake Valley.

All went well in bright, sunny, calm weather; it appeared that we were in luck. The Pass was blanketed with deep snow. I requested to land and examine it. The pilot circled in preparation to run in on one of the two small lakes, straightened and lowered his flaps, skimmed the snow and slush underneath splattered up over the cowling and windshield. With rapid mental and muscular reflex, the pilot gave the gun to avoid settling into the wet snow and be stuck in the remote mountains, far distant from any source of help. We gave a little prayer of thanks.

I had to be satisfied therefore with low level flights to observe the Pass and the mountain slopes to Iron Creek. It was safe to land and gas up from a cache surplus to our summer operation. Locations where snow sheds or tunnels would be required for protection to railway maintenance and operation were noted, then we returned to Dawson at sundown, thankful we were not stranded in Goz Pass.

Maintenance of way and operation during winter would certainly demand special precautions. Official temperature readings record minimums to 74 degrees F below zero at Dawson. However, not far away, at Snag, minus 82 degrees F has been experienced.

Our return to Whitehorse was by highway with a stop at Taklini hot springs, about midnight, to swim in the open under the Big Dipper and North Star.

To observe actual winter maintenance and operation on the W.P. & Y., I travelled in the cab of the leading diesel of a freight during a snow-storm to Skagway. It was an informative experience. Tunnels are protected from drifting snow by doors at the entrances that are opened by patrolmen as the approach of trains is signalled. Maintenance forces with dozers are stationed at the Summit throughout the winter to clear snow; their job demands nerve and judgement, especially tracking across the narrow decks of high viaducts.

Also, I was taken by track motor car to view glaciation, from the upperside of the roadbed, onto the rails; a serious condition to be removed by hand. It was also an opportunity to view the Port during winter; although zero days are said to be rare, forty below has been recorded. A comfortable journey by B.C. Ferry Service landed me at Prince Rupert.

C.N. senior officials approved my final report and it was presented to the Department at Ottawa and to Crest Exploration. This project was the seed that has grown to become Canadian National Railways' and Air Canada's subsidiary -- Canac Consultants Ltd., with world-wide interests.

An agreement was about to be made for sale of Yukon iron ore to Japanese steel corporations when higher grade ore was discovered in Western Australia, much more accessible. Therefore the Iron Creek project was shelved; however, it is safe in the bank for future development.

20. LEISURE PERIODS

It is said, "All work and no play, makes Jack a dull boy." On the other hand, "Too much leisure is conducive to laziness." -- "A happy medium" would appear rational!

Sixty years ago, long service was rewarded, at the most, by two weeks annual holiday, but for personnel on location and construction, never during summer ... the season to 'make hay'.

My first holiday was during Christmas-New Year's, 1912/13, to England. There were no more except for periodical army leaves, until 1920 for a short trip to Vancouver Island; then to England, Christmas 1929, without pay.

After the "Hungry Thirties" and World War II, annual holidays with pay were approved and our family finances improved.

Alaska Cruise

During the hectic period of location and construction to Lynn Lake and Kitimat, Reg. McMillan, V.P., instructed me to take a break and he kindly arranged for a hard-to-get cabin on the S.S. Prince George. Helena and I embarked at Vancouver, 5 August 1952, for Skagway and to go inland by W.P. & Y.R. -- a truly delightful ten days, return trip. The weather could not have been improved. The itinerary permitted taking walks at the coastal towns, all interesting, two in particular:

Juneau -- in the Baronhoff Hotel we were told ice in our drinks was from Mendenhall Glacier; one thing for sure, there was more ice than liquor! Lena was enthralled by a large oil painting of mountains, with an Indian squatting by a tiny fire; then we drove to observe the mass of ice moving inexorably towards the sea.

Skagway -- the "George" docked at 9k. It was but a short walk to board the W.P. & Y. train. The engineer gave full throttle to climb the four per cent gradient from sea level to White Pass. At Dead Horse Gulch, looking down the cliffside, the imprints of heavy boots and horse shoes are clearly visible on the trail of '98; hundreds of pack animals died there. It is said some deliberately threw themselves to death.

At Bennett station, a stop enables passengers to view the old

log church on the nearby knoll, from where there is a magnificent view over the lake, between stark mountains perfectly mirrored in the -- this day -- calm water. The railway hugs close to the shore, there is just room for it at the base of the cliffs.

We detrained at Carcross and went aboard the stern-wheeler steamer, Tutshi, in time for lunch and departure via Tagish Lake and West Taku Arm to Ben-My-Chree by evening; a sail in such sunlight and fair breeze that it will forever be recalled.

Romantic Ben-My-Chree, "Love of my Heart" is a log home, not just a shack, built by a mining engineer for his bride. It is surrounded by masses of flowers which grow in profusion during the long hours of daylight of northern summers. W.P. & Y. hostesses serve wine to continue the open-house hospitality of the original owners.

When we turned about, a full moon shone on the snow-capped mountains and the entrapped lake; a scene to captivate all appreciative voyageurs from turning in.

Again at Carcross -- caribou crossing -- while waiting for the train for our return to Skagway, there was time to chat with George Carmacks whose discovery set off the "Gold Rush". Lunch, implied to be moose meat, was served in Bennett station during the meet with the northward train.

Much history, and old-timers too, are buried at Skagway. The Engineer vigilante and gangster Soapy Smith met on the dock and fired simultaneously; both are under green swathe in the cemetery, shaded by dark spruce trees.

The Arctic Brotherhood Hall is an amazing building, faced with small logs in intricate design. Gardens are bright with varieties of flowers and so are Alaska State flags with the Big Dipper pointing to the North Star.

Evening entertainment was a skit on Robert Service's poem, the "Shooting of Dan McGrew", by actors in authentic period costumes, quite realistic, excepting Dan was slow to fall. 'Can-can' girls and lively songs added to the jovial presentation. Lena and I were reluctant to leave when the whistle blew to reboard the Prince George.

Good weather held for cruising Endicot Channel with bergs

floating about from nearby glaciers, then through Wrangel Narrows to Ketchikan ... city of timber docks, many bars facing on plank roads and sidewalks, also skilfully carved totem poles. Douglas Channel, Gardiner Canal and Devastation Channel, within sight of Kitimat, furnished the most outstanding scenery and fishing of the whole cruise.

## Hawaiian Islands

Warm blue seas, sand beaches, swaying palms and happy brown people lured. Helena and I had three delightful holidays there; we stayed on six islands - Oahu, Hawaii, Kaui, Maui, Lania and Molokai. Visitors are not welcome on Nihau, owned in freehold by ancestors of a Scotch family who wish to maintain the old manner of life; and barren Kahoolave is restricted for bombing practice.

Our first view was from C.P.A. flight, at sunrise, 13th February 1954. Lush greenery showed up approaching Honolulu, then Diamond Head and Waikiki Beach, for a landing at the International Airport.

During the overnight flight from Vancouver, in the first-class section, C.P.A. traffic manager discovered we were CN people and that we would be in Honolulu only long enough to transfer to Hawaiian Air Lines for the 'Big Island'; so he said, "I keep a room at the Moana Hotel, facing Waikiki Beach. I will not be using it today, take the key and freshen up while waiting for your connection. If you are not too hungry, I recommend fruit salad for lunch."

Stepping from the cool room to the verandah, the sea and sand were too dazzling for comfort, until becoming accustomed to it. In the coffee room, each of us was served a large pineapple, hollowed out and filled with a variety of tropical fruits, together with buttered crusty buns and coffee ... as delicious as we had expected.

On the local flight to Kailua, the stewardess was smartly turned out and with a small passenger count she had time to describe special features of island life. I said, "I am going to be rude. What are you!" She laughed and replied, "Mostly Korean, with a few other strains thrown in." The inter-racial mixtures on the Islands result in very beautiful women, handsome men and good fellowship.

Rambling Kona Inn was the only tourist accommodation along the

Kona Coast. The floor covering of the inviting rotunda was a great circular palm mat of intricate design and a highly polished table of koa supported a huge display of exotic hibiscus, antheriums and orchids. When registering, I requested a room facing the sea. That was a 'faux pas', the receptionist said, "All our rooms face the sea." Doors from a long corridor opened to spacious rooms with the entire front sliding windows which were seldom closed; coconuts were within arms' reach.

The dining room set for dinner beckoned; we were assigned to a table, for two, by a low stone wall separating the interior from the lawn and sea front of black volcanic rocks on which the surf broke into white spray, whetting even the dullest of appetites.

Soft warmth and fragrance of plumaria encouraged evening strolls. Naturally sociable people of the village would fall in step and chat about this and that, particularly about Canada. Two churches, the original mission of rough rock, the other a striking edifice of pink coral, were pointed out, with the remark, "That's the Christian Church and that's the Roman Catholic Church," respectively. However, Lena, belonging to the latter, took it with high good humour. They were such happy evening walks.

In the tower of the old stone church, at sunset each day, tunes of hymns were played on a clarion, even reminding me to check my manners and language!

Next door the former king's palace, now a museum, contained many interesting relics of Hawaiian culture. Kings and chieftains were huge persons, 350 or more pounds and muscular; they tossed about solid stone balls, shaped to perfect radii, so heavy that few today could lift them an inch from the floor. Queens weighed no less, but were not redeemed by exercise. It is to be regretted that so few pure blood Hawaiians remain.

Kona Inn was so congenial that we stayed for two weeks before moving to Volcano House, overlooking one of the craters of Mauna Loa which bubbled like a huge caldron of hot porridge. Walking around through tall tree ferns, it was advisable to be watchful not to fall into steaming crevices. In the hotel the natural steam bath was operated by pulling a plug from the floor.

Hilo, the capital of the Big Island, is renowned for the culture and export of orchids. We visited a large commercial operation by a

Mrs. Hill. She appeared to appreciate our interest, so told our driver to take us to her home to see special specimens, some valued at hundreds of dollars, kept under lock and key. The butler showed us through the orchid houses and the home too; a spacious living room, with a huge reclining sofa, the largest I have seen, was wide open to the sea. Her husband, known as "Doc", arrived from the Mainland penniless, pedalled eye glasses and prospered, to become Senator Hill.

A violent electrical and rain storm greeted us on rising the morning of our departure from Hilo. It was surprising that the plane took off to fly by the two volcanoes Mauna Loa, 13,680 ft. and Mauna Kea, 13,796 ft., and across open sea to Honolulu, where we transferred for flight to Kaui, called the "Garden Island". It is indeed, and extremely rugged too, with a 'grand canyon' of its own, also high precipitous cliffs, sheer to the sea.

We had a competent and jolly driver, a girl who had driven for the U.S. Army. Passing a plantation she pulled a wicked looking machete from under her seat, stopped and said, "We will borrow a pineapple," and sliced it up for luscious refreshment on the spot.

Helena, always keen on history, wished to visit the royal residencies and museums in Honolulu, so we sojourned at Waikiki before returning home. This curtailed description reflects some of the culture of the proud islanders; hands were not outstretched for tips; we are thankful to have enjoyed the tranquility of Hawaii as it was in 1954, prior to the influx of tourists en masse.

## Jamaica

Reports about the express train, Panama Ltd., on the Illinois Central between Chicago and New Orleans, interested me to take it, en route to Jamaica, rather than fly the entire distance. It was an overnight run, well patronized, so dining cars were crowded. On arrival, 25 March 1955, walking along the platform, Helena breathed the southern air and said, "Isn't it lovely."

We remained at New Orleans for three days to see the old French quarter, the zoo and botanical gardens. Also, took a night tour; although Lena said nothing, I was apologetic for exposing her to some of the night club acts.

Leisure Periods

An evening flight put us down at Montego Bay after midnight. Our destination was some distance out at Tryall Lodge. The housekeeper was on hand to drive; the scenery along the coast in moonlight was superb. I remarked, "It is very kind of you to meet us in the middle of the night." The lady replied, "We never fail to meet our guests." That was reflected throughout our stay. As we were shown into our room, perfume of flowers predominated.

Tryall had been the home of slave-owning sugar planters, sited on a promontory overlooking Sandy Bay. Sitting with an after-dinner liqueur, it was easy to conjure pictures of old-timers in the dark with few other whites near, amongst blacks who would cheerfully cut their bosses' throats; they must have been stout-hearted gentlemen and their ladies too.

Saddle horses were there for the guests. In the mornings, I rode with the stable boss and had interesting discussions with him. Sometimes he took me up into the hills to camps of descendants of revolutionary slaves who clearly resented intruders. I took the advice to hide my camera. Other times we galloped on the hard sand beach and splashed in shallow salt water. I regret Lena was not well enough to join in these outings; she loved horses and dogs.

Some evenings a buffet dinner was served on the beach and native dancers entertained; their agility, despite loose sand, was amazing. The star performer was the fire-eater, he swigged an inflammable mixture and ignited it in his mouth. Flames shot high. He said, "Me the blow-fire man." He certainly deserved a good tip.

Sunday afternoons there were polo matches. Rum punches were served. Another day, the lady of the house organized a drive to Negril Beach and picnic there. A beautiful crescent of sand with overhanging palms and crystal-clear water; except for a few native fishermen dozing in the shade, we had it all to ourselves. Waiters set up tables, laid out white linen cloths and served rum punch in short order, and brewed tea for those who preferred it.

In a U-drive we circumnavigated the Island. Roads were narrow with sharp curves and steep gradients, but the black-top surface was well maintained. Driving required careful attention at all times to avoid running into inadvertent pedestrians. I was fortunate to avoid a black fellow resting prone on the black road, under the shade of dense foliage.

Leisure Periods

Easter we were at Bonnie View Hotel on the hillside above Port Antonio. The view was bonnie, over the native village to the harbour, where a shiny white banana boat rode at anchor. There was no sleep with incessant singing, dancing and drumming in the village. Breakfast was served on the verandah of our room. Fearless humming birds fed on our jam and white egrets waded in a stream below.

At Kingston, traffic was in such confusion that it was a relief to safely park by our hotel before continuing to Montego Bay for return flight, via Cuba, to New Orleans.

On entry, I was questioned for proof of vaccination; forms had to be filled in. The girl at the typewriter asked, "Colour of hair," I said, "Fair." She looked up and said, "Grey." -- I realized time was catching up!

Lena and I enjoyed Jamaica, but the environment lacked the spontaneous happiness of Hawaii.

To Hawaii, 1962

During the intervening eight years since our first visit, flight time from Vancouver had been reduced. We had a smooth trip weatherwise, but one lady and three gentlemen, feeling no pain, boarded to occupy two seats opposite us and en route they refused none of the liquor so freely served. Antics of the lady, endeavouring to propitiate one of the gentlemen, apparently her estranged husband, amused me but disgusted Helena.

Our hotel was the last stop for the limousine from the airport; luggage had been unloaded on the way by mistake, so we spent some time retracing the route to find it, but it was a pleasant early morning excursion. We stayed at Waikiki until afternoon take-off for Kahului, Maui.

We were fortunate to be given a choice room, with door opening directly to the beach for hopping out of bed and plunge into the sea. There were other attractive features at the Maui Palms. The entire staff was so friendly; after dinner the hostess and her girls kicked off their shoes to dance the hula and sing to the haunting music played by the boys, with the pool and exotic garden for backdrop.

Lena kidded me, with a playful jibe, "You are over the hill, boy," about photographing a very very charming hula girl. I retaliated to Lena with reference to her attraction to the assistant manager, an outstanding Hawaiian of true descent, well educated, ex U.S. Marine Corps Officer, who played the big base cello. He summed up island life, "We have lots of fun." Sleep was lured by an orchid and little verse, placed on our pillows ... a charming gesture. Our maid was Mrs. Kawada, from Japan. She invited us to he to her spotless home to enjoy her native dishes and, on Sundays, we went to worship together with her husband at the United Church, with walls of thick stone and high-arched roof. Cooling sea breezes entered through open doors and windows; services were followed by buffet luncheons of native food ... altogether delightful.

Maui has many points of interest. At the top, literally, is Haleakala, an extinct volcano, with summit 10,015 ft. above sea level. The trail to it is narrow, winding and steep with few passing points. Sunrise there was spoken of in awe, so I started from the "Palms" at 4:00k for a lone drive to arrive before daylight. The morning air was cool, even a little snow and ice at the rim of the crater; not a soul about; it was spooky recalling the legends. I was relieved when the sun appeared above the horizon out to sea, and Hawaii Island, fifty miles distant. Radio reported 55 degrees F at sea level; an all-time low.

Lahaina, the ancient capital and whaling station, was at one time under control of Russia; old cannon remain as evidence. Fishing craft and rakish yachts ride at anchor off the massive rock quay in front of the stone hotel with cool bar furnished in mahogany, dark with age. The speciality is a 'harpoon'; be cautious, they may be dangerous. A giant, pure blood Hawaiian bartender, however, limits the unwary to two.

Entering the Episcopalian Church, Lena and I met the rector, a handsome young man from California. His wife, a beautiful Hawaiian, emerged from the rectory next door, with garden to the sea and soft breezes whispering through palm fronds. I thought, "Boy, you have it made!" With more respect, I turned to the arresting altar, unique with a glorious rendering of Madona, a native girl and babe, centre panel and scenes of the sea with canoes and nets at the sides.

Driving to Hana -- the trail is at the toe of rock cliffs with waterfalls streaming to the sea close by -- demands concentration. Carloads of young Hawaiians swooped downhill and around sharp curves,

laughing at my caution.

This end of the island is ranching country, where Colonel Lindbergh was recently borne by cowboys, in a coffin of local wood, to his grave. The economy of Maui, however, apart from tourism, is principally dependent on production and export of sugar and pineapples.

We stayed at the Palms for nearly a month. When I was paying the account, it was helpful that the room rate was lowered, without request, from $19.00 to $14.00. The youthful manager, Norman Hondo, of Japanese parentage, and his wife, were very hospitable throughout, entertaining us in their personal home.

We took a direct flight to the central island, Oahu, to see more of it and Honolulu city, from a base -- quiet Kaimana Hotel -- at the foot of Diamond Head, yet within walking distance of Waikiki Beach.

Our lanai faced a park where Kodak public relations people stage weekly authentic hula shows. Contrary to general belief, the costume is not a 'little grass skirt' but a formal evening gown, revealing slow swaying hips and sensuous movement of arms and hands right to fingertips ... "Lovely hula hands"; indeed they are.

A Church choir, of plump grandmothers, rendered exquisite songs of the sea, in particular, "Beyond the Reef".

In contrast, Tahitian dancers rotate their entire body in a most sensual manner -- bumps and grinds -- with amazing speed, like an air-operated rivetting gun.

The open Pacific pounds the jagged cliffs of the north shore, to hold artists and ordinary nature lovers for hours. It is difficult to break away from such wild seascapes, but we had obligations waiting at home.

Hawai, 1963

Helena was a good sailor, never had the least twinge of sickness at sea. We had the time for a voyage, so booked first class on the R.M.S. Oriana, of P. & O., to sail from Vancouver, 25 March. When I mentioned this to Prairie Region V.P., he enquired, "How are you going to Vancouver?" "By T.C.A.", I replied. "I will be pleased to assign

my car for you to go by train." This, of course, was agreeable!

'Ninety-two' was one of the better-appointed business cars, with ample room for guests and Jack, the steward, was always out to please. It would be nice to take Eira and our granddaughter, Leslie Anne, with us as far as the Coast.

It was about Easter; we left slush of thawing snow, to break into spring around Kamloops, perhaps glimpse a bear or two toning up on skunk cabbage -- to me a harbinger of spring -- thence alongside the rushing waters of the Thompson and Fraser Rivers, passing Hell's Gate, under the 'Crab' on the face of Jack Ass Mountain, to burst from the half-mile long tunnel at Yale, where the valley widens to lush farm land about Chiliwack through to Lulu Island and the Delta, where waters from far northern glaciers finally merge with the Pacific ... all recalled stirring conflicts with slides and washouts.

Arrival at Vancouver gave a spare day. We took out a U-drive for a trip, by ferry, through Active Pass to Sidney, then drove to Victoria and over the Malahat Drive to Nanaimo and return by the Horseshoe Bay ferry. Next morning we booked seats on T.C.A. for Eira and Leslie Anne to return home. In the evening Lena and I embarked.

The Oriana was on her maiden tour around the World. She called at San Francisco for two days of shore trips and one day at Long Beach before setting course for Honolulu. The weather improved daily but rain was falling when we disembarked and taxied to the airport to take off for Kona.

The Inn was the same inviting place as it was in 1954, except for an addition of a coffee shop which tended to impair its image, but two hideous concrete, so-called modern, hotels had been erected during the intervening nine years and bulldozers were working on the site for another monstrosity. Kona is not the charming village it was.

We stayed a week and enjoyed every day renewing acquaintances there and at Volcana House. "Uncle George" who, as a young man, opened the 'House', hail and hearty at ninety-six, took quite a fancy to Lena.

We visited the Parker Ranch, on a plateau 4000 ft. above the sea. It came into being in a strange manner ... Capt. Vancouver presented the King of Hawaii with cattle; however, they were not cared for so

went wild. Later a sailor, during his ship's call, became enamoured with island life and jumped ship. He heard about the cattle and approached the King for a franchise to round them up. This was granted and the ex-sailor, Parker, over the years, developed the ranch to be the second largest in the world. Cattle are driven to a convenient bay and herded into the sea to swim to ships anchored off-shore and be hoisted aboard, with much bellowing, for export.

A great-granddaughter has written "Born in Paradise" relating her life on the range, even now so heavenly that one can envision the privileged carefree girl.

Hankering to ride an outrigger canoe -- the real thing, not just a common tourist experience at Waikiki, I persuaded a fisherman to take me along. Standing in the surf about to board, he indicated a single life jacket and said, "That's for you, I can swim." By lord, he could swim! Moreover, he dived to wrestle with turtles and hammer off coral, for sale. A heave took us through the surf for several hours at sea, being doused from time to time and hot sun dried salt on our skin.

On landing, this seafaring young man took me to his little home at Keauhou Bay, for introduction to the cutest Phillipino wife -- another 'heavenly' setting. But, not always so. Captain Cook was murdered not far away; the site is marked by a memorial, on one acre of land that is British by treaty and is cared for by New Zealand's navy.

So far in this treatise, something has been said about four islands; there are two others, not so well known to tourists. From the height of a sheer cliff we looked, and shuddered, towards a flat area confined by the sea so the only approach was by boat, where lepers are isolated. Today they receive the best of medical attention, but not so long ago; they were disembarked on the beach to face horrible conditions and exist as best they could, until death released them.

Molokai, however, has a happier side, where shipwrights work under the shade of huge trees with blacksmiths' bellows and tools not often seen in this age.

A short hop to Lanai, owned entirely by the Hawaiian Pineapple Company, permitted us to marvel at acres and acres of pineapples in row after row scientifically cultivated. Before planting, the reddish soil is analyzed and, if necessary, it is fertilized. Then black

paper is rolled on in long rows to be punctured at precise spacing for young shoots to be poked through into the ground. Not a weed was to be seen.

Points of interest we had not time for during 1962 beckoned again to Maui and good friends at the Palms. It was the end of April. Flowers were even more beautiful than earlier in the year. Jacaranda trees, attaining heights to forty feet with spreading branches, were in a profusion of delicate mauve blooms and hibiscus of many hues were everywhere. We were invited by Mrs. Konda, wife of a physician, to view her formal Japanese garden with hanging jade and many varieties of exotic flowers. She gave Helena a bulb of a prize lilly, deep crimson. It gave me a source of fun with Lena; she smuggled her forbidden plant under her skirt to bloom at Winnipeg for some years, although indoors, nevertheless beautiful.

At a higher elevation, conditions were ideal for carnations. A family, father, mother and daughter, told us that in season they consigned several thousand blooms daily to states on the Mainland.

When we could stay no longer, Norman, manager of the Palms, and his wife drove us to the airport and draped gorgeous leis, each made of three hundred carnations -- Lena's white, mine red -- around our necks, with 'Aloha'. At Honolulu, quick transfer embarked us on S. S. Oronsey. The carnations adorned and perfumed our cabin through the voyage, direct to Vancouver, Sunday afternoon, May 5th. Many strollers in Stanley Park watched our ship and outward-bound S. S. Arcadia, also of P. & O., passing each other beneath First Narrows bridge. Press photographers did not miss this memorable scene.

Unknown to us at the time, Helena's health would slowly deteriorate during the ten years ahead. Therefore we were not permitted, by fate or whatever, to enjoy another long holiday together.

21. TAN-ZAM RAILWAY

Northern Rhodesia was declared a republic, Zambia, in the fall of 1965 and desired to cast off dependence on the railway built during the era of Cecil Rhodes, between the Indian Ocean port of Beira and the Copper Belt at the border with the Congo.

Appeal was made for a feasibility survey for an alternative route, principally for the export of copper. Great Britain and Canada answered the call by setting up the British-Canadian East African survey; costs to be borne fifty-fifty.[57]

Canadian Aero Service, Ottawa, was awarded a contract by the Government of Canada to do our part -- select the route, photograph it, plot maps, project a location and estimate the cost for construction. Dr. Zarzycki, V. P. of Aero, Charles Hoefsmit to be financial and office manager, Jim Thompson assistant engineer, and I, chief engineer, met at Montreal, November 22, 1965, for overnight flight to London.

We registered at Hotel Waldorf and called on Livesly & Henderson, Consulting Engineers, our British associates and met John LePivert, a partner, and Robert Busby to be my deputy, and had lunch together. Afterwards we met Mrs. Burman, Secretary to the Honorable Maxwell Stamp, International Economist, who would undertake that portion of the study. George and I were taken to dinner by Mrs. Burman, a charming lady, and her husband in a cozy little restaurant.

In the morning we made final arrangements for our journey to Lusaka, capital of Zambia. I wandered off for a walk along the Thames Embankment and to renew acquaintance with a few other London landmarks, visited with Helena and our children in 1929, when we met my first Chief and mentor, Major L. E. Silcox, D.S.O., M.B.E. Now, with a feeling of pride, I was following his footsteps to East Africa; memories of so many happy times came to me.

It was 19:00k when we Canadians left with LePivert and Busby for Gatwick airport to board the long flight. But we were delayed and it was midnight when the lights of England were left behind.

At 10:00k the craft was fuelled at Entebbe, Uganda, near Lake

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[57] J. L. Charles, "Zambia Rail Situation," Canadian Geographical Journal, LXXV (December, 1967), 206 - 217.

Victoria, with outflow to the Nile. The runways were fresh from overnight rain. In the terminal building a display of native weapons and big game trophies caught my attention and made me eager to see live lions, elephants and others in their natural habitats. It was good to have a short stroll. At Ndola we went through immigration and customs to enter Zambia, 25 November 1965.

John Laing, Maxwell Stamp's resident representative, and newsmen greeted us at Lusaka and directed us to the Ridgeway Hotel, four two-storey buildings forming a rectangle around a large pool bright with lilies and gold fish. There were restful rattan chairs at tables in the shade for patrons to relax with long cooling drinks and good food, altogether a charming environment, reminiscent of colonial life on the way out -- for better or worse.

Next evening a reception was given to officially welcome us. I had the privilege of a chat with President Kaunda, a genial dignified head of state, with great expectations for his people -- 'shoes for every Zambian' -- abstentious of liquor and frugal; some of the other parliamentarians present did not set such a good example to the populace. However, all were very helpful. An office was allocated for Charlie Hoefsmit to establish a base.

Supply of petrol by pipeline, through Mozambique and Rhodesia, was cut off and strictly rationed. A landlocked country, Zambia was in a precarious position and requested a squadron of R.A.F. to be stationed at the capital. Our survey was given special privilege and carte blanche for surface and air travel.

The existing railway within Zambia from the Copper Belt to the southern border, formerly part of the Rhodesian system, was taken over by the new republic. The obvious point for the proposed Tam-Zam line to turn off was near the mining field, adjacent to the border with Congo, somewhere about Kapiri Mposhi, to run north-easterly, some 1200 miles, to connect with the East African Railways and Harbours System for entry to the port of Dar-es-Salaam, the capital of Tanzania, also a recently proclaimed republic.

Apart from these general designations of where the termini should be, there were no political or other suggestions or pressures for the line to be located through certain districts and towns. It was to be entirely on my judgement; I was free to act accordingly.

A light craft was chartered for me to take a general appreciation

of the factors which might affect the survey. One day a storm prevented return to Lusaka. It was necessary to land at Ndola, where Dag Hammerskold, secretary of the United Nations, lost his life in a crash.

The pilot had a small overnight bag, but I was in shorts and short-sleeved shirt. Somewhat to my consternation, the African headwaiter stopped me as I was about to enter the hotel dining room. With obvious pleasure he said, "Sir, you are improperly dressed." There was nothing to do but accept it with good grace, turn about to my room and call for room service for a lonely meal.

Violent storms arose without warning. Another day we were obliged to cross the border of Zambia into Malawi for emergency petrol. Fortunately the local officials were not too officious and permitted us to fuel and return across the border into Zambia.

Then, home through Luangwa valley, plentiful with big game, particularly elephants and buffalo, zebra, wildebeest, elands and others. It is not gentlemanly, but nonetheless exciting, to buzz them -- almost too much so when an eagle flew against the under-carriage; fortunately only a glancing blow but enough to make us more careful.

Before entering the Republic of Tanzania we were required to present our credentials to Government officials. At the time there was no direct commercial flight from Lusaka to Dar-es-Salaam, so we had to go by a circuitous route, with a day long waitover at Salisbury, Rhodesia. A beautiful modern capital, this Sunday the parks were ablaze with flowers; 'White' gentlemen in their correct flannels, played cricket and bowled on velvet smooth grass, and their ladies, beautifully gowned, looked on from reclining chairs under shade trees. No 'Black' dare intrude.

In brilliant sunshine, it appeared strange to see elaborate Christmas decorations -- Santa Claus, Mother Goose and Old Woman in her Shoe!

Another stopover was at Nairobi, Kenya, at midnight. Almost at the Equator, it was surprising to be approached by baggage porters, wearing woolen turtlenecked sweaters, until one realized the elevation was 5,500 feet above sea level. A pleasant drive by taxi took us to the city, with wide streets and flowering trees, which I was to visit many times.

Tan-Zam Railway

After a comfortable night at the New Stanley Hotel, we proceeded to Dar-es-Salaam. Canada's interests were well cared for by our High Commissioner, Mr. McGill, native of Smithers and graduate of U.B.C. We called on him for advice on procedure.

At the impressive entrance gate, a smart sentry challenged and let us pass to drive along the way, lined with gently swaying palms, to the State House -- dazzling white with black wrought iron grilles, a grandiose example of colonial architecture in the tropics, as styled by its German governors prior to being taken over by Britain during World War I. Now native Africans ruled.

It was cool within the thick walls and wide-open windows admitted breezes from the Indian Ocean close by. After an appropriate wait in an anti-room, George, John and I were ushered in to be received by the President. He sat, in simple attire, at one end of a highly-polished table, with a shield and spears on the wall behind him. It was December 6th, 1965.

With quiet dignity, Dr. Nyerere welcomed us and discussed the proposed railway. He expressed he was interested in assistance from Western Powers and/or Communists; it appeared to me that he was inclined towards the latter, as has since been demonstrated.

Mentally I compared the presidents of Zambia and Tanzania; my preference was for Dr. Kaunda.

Mr. & Mrs. McGill entertained us for 'sundowners' on their verandah, facing Oyster Bay and ships riding at anchor. Servants, in immaculate white, served long cool drinks and tasty bits. Before we bade our hosts adieu, a full moon shone on the waves lapping the sandy beach. An environment, for a couple in foreign service, with almost all they could desire, except their children at school in England.

Our hotel was the Kilimanjaro, recently built, fronting on the sheltered harbour and back towards the open sea. A grand place, but patience was required to wait for service by staff in training. From my room, ships from many nations, local yachts and native fishing craft, made an interesting picture. Maxwell Stamp was also at the hotel, a fine fellow to dine with at his expense; he was accustomed to good food and wine. I asked him, "Why are you 'honorable'?" He said, with good nature, "I am the eldest son of a peer."

There was great excitement, parades, dancing and drumming to

acknowledge a state visit by the President of Sudan. The Tanzanian mounted guard of honor, armed with lances, was striking in distinctive uniforms of red tunics, white breeches, high black boots and polished metal helmets.

However, it was a disturbing period. Tanzania broke off diplomatic relations with Great Britain, the Union Jack was lowered, and the High Commissioner departed for London. Depressing to me, except I felt pride that Canada's Mr. McGill watched over the 'Mother Country's' affairs.

At Nairobi for a week to confer with the East African Railway officials, it was moving to me to find a map with signature -- L. E. Silcox. My birthday came around, 15th December; I was seventy-three and treated by E.A.R. and Canadian Aero to a memorable party. Public Relations attended to, George Zarzycki departed for Ottawa. I was on my own.

I left Nairobi by E. A. Airlines for Dar to meet Canadian Aero's Apache, equipped with camera, expected from Nigeria. When it did arrive, repairs were necessary. While waiting at the Kilimanjaro, I met Capt. Cadwallader, an ex-R.A.F., with a magnificent reddish handlebar moustache, Chief Pilot of Tanzania Government Air Fleet. During dinner, he said, "If you are ever in trouble, contact me."

It was 20 December that we, the pilot and I, took off from Dar for general reconnaissance to the Copper Belt; thence to the Ridgeway Hotel, Lusaka, evening of the twenty-third. During the following two months, the controlling features were studied in detail with aid of a helicopter.

Christmas 1965

Lusaka was a city of about 125,000 population. The main thoroughfare is spoken of as the "Cairo Road", six traffic lanes and two for services, divided by a centre strip with flamboyant trees, a blaze of red in season, flanked by modern business blocks. At elevation 4200 ft. the climate is pleasant, and there are well maintained residential districts. In contrast, there are adjacent tin shanty towns.

On a preferred site, the Anglican Cathedral, with its high nave, dominates the surroundings. Busby and I attended midnight service.

Tan-Zam Railway

Being far from home, one might as well work. Early Christmas morning I left by Land Rover on the Great North Road to make contact with a pilot, Jan Patcha, and copter at M'kushi River. At the time, there were no copters in East Africa, so one had to be brought in from Rhodesia; under the circumstances, a ticklish manoeuvre.

Jan and mechanic, Jack Harris, were at our rendez-vous, a quaint little African country hotel of local brick and corrugated iron, in a beautiful site, surrounded by eucalyptus trees, tall geraniums and other gorgeous flowers, facing a waterfall making tingling music over the rocks.

The proprietress was 'white'. She served the usual Christmas dinner -- quite good. I found a lucky little Rhodesian three penny piece in the plum pudding. There were no 'black' guests in the dining room, but later natives from nearby indulged and danced outside. How they could dance! Even small children, full of rhythm; young mothers sat by with a babe at breast and a bottle of beer in hand!

Boxing day, an old retainer with a stable lantern and pot of tea awakened guests for breakfast; by then it was daylight. Jan and I took off to inspect the Zambian Railway, select a take-off point and commence surveying north-easterly for 170 miles and returned.

Standards of the existing railway were good -- rails welded in pairs so joints were 62 ft. apart with treated timber ties on 18 inches of crushed rock ballast, well maintained. Motive power was in process of change from steam to diesel.

M'kushi River is the northern limit of corn and tobacco cultivation, by Europeans living in a gracious manner with African labor well cared for in hut compounds with personal gardens. All 'whites' are termed Europeans -- I was. Natives are 'Africans' and immigrants from India are 'Asian', speaking two common languages, English and Swahili. Newspapers and radio broadcasts are in both, but now, 1975, nationalists are endeavouring to have Swahili proclaimed the official tongue.

We worked forward over moderately rough terrain, fairly well timbered and sparsely settled, to M'pika, a lonely point, and put up at the Crested Crane operated by a Rhodesian couple, the only Europeans in the area. Nevertheless the lady maintained tradition

by insisting on slacks, long-sleeved shirt and tie 'after five' in the bar and dining room -- a pleasant spot with fragrant perfume of plumaria in the evening.

Jack, the mechanic, followed up daily by Land Rover with spare parts, petrol and oil.

As mentioned, petrol was strictly rationed by card system. Last day of 1965, a government official drove up demanding his car be filled up although his ration was exhausted. Of course, the 'white' lady refused, whereupon the 'black' knocked her to the ground. She ran in to her husband and he rushed out threatening to shoot and called the police, without avail. The outcome was he was obliged to apologize to the black official; he had but one option, leave all and go away broke ... a tough situation.

New Year, 1966

As usual, there was open house at the Crested Crane on New Year's Eve. The bar was especially interesting, with mementos and names of South African and Rhodesian troops on their epic march to fight Mussolini's braggard legions into a rout. The proprietors, Jan, Jack and I were the only Europeans in the room; all was jovial with free liquor. The senior local official, the District Secretary, replacing the former District Commissioner, addressed me as 'Old Man' a complimentary term, until he became fairly loaded and demanded to be taken up in our copter. When I offered reasons against this, he challenged our right to fly over his territory; he might have been troublesome next morning, but we were away before he was around.

The day, however, did bring us trouble but of a normal nature. Strong head wind slowed us to consume more fuel, we were out when Ilondola Mission appeared. We landed, causing much curiosity and excitement; it was the first copter seen there. The hospitable 'White Fathers' invited us into their cool, thick-walled quarters to share their lunch. Jack would be waiting and worrying at Chinsali with petrol.

A young Father from Quebec had a motor bike and volunteered to go over the rough bush trail to redirect Jack. We waited to late in the afternoon without word, so decided to chance some bike petrol to reach our aviation brand. Luck attended this and all was well.

The terrain was becoming more rugged and there were several possibilities to be investigated. We moved to Kasama where there was a former Northern Rhodesian Government guest house. Sitting on the verandah, I witnessed one of the most violent electrical storms I have seen.

At times we would prepare to land in the copter where it appeared there were no natives about, but were seldom successful. They would come running from all directions and surround us, endangering themselves and us during take-off. As the engine reved up and the machine rose, then swooped down and forward, terrified onlookers would drop prone to the ground, children clutching their mothers, sometimes in mud; pathetic, but no amount of warning prevented it.

Once when forced to land by violent rain and wait it out, Jan and I sat in the bubble, resembling two monkeys in a cage at a zoo, with the curious, dripping wet, looking in. A bright young man said, "We are happy for you." I think that we landed safely.

A heavy ascent took us to a summit, elevation 5430 ft., at the border between Zambia and Tanzania. Fortunately, there was a European official inspecting Customs and Immigration; he passed us through promptly, otherwise we would have been delayed perhaps for days. On the Great North Road, trucks were backed up for a mile or more each side of the barrier.

In the village, Tunduma, an old Scotty and a retired Australian nurse operated a simple but quite comfortable small hotel. After dinner we chatted by an open fire. The building was owned by a dedicated lady doctor, who lived next door in her personal bungalow with a monkey for company. She was a gracious person and had devoted forty years to aid the local natives.

The "Border" range broke off sharply into Tanzania. I spent some time studying it easterly to the head of Lake Malawi, 2000 ft. deep, and the Livingstone Mountains on the far shore, rising to 8000 ft. above sea level.

After unravelling this, our base for a time was Mbeya, an interior administrative centre and coloured native market nestling under the peak, elevation 9270 ft. Hotel windows had disfiguring burglar bars, comfortable nonetheless and the fare was good. Homes of former European occupants and their well-tended gardens were

being let go to weeds by the new African tenants. The country club was not what it had been, yet hospitable for a sociable evening. Once, when approaching during heavy rain, I was suddenly challenged by a watchman with a wicked long spear.

Banks and other important buildings, even in the city of Nairobi, were guarded by natives armed with spears. They wore old army great coats and sat on the sidewalk by a brazier of charcoal against cool night air.

Scouting on a rough trail by Land Rover, in four wheeled drive, towards Mt. Mbeya led me to a coffee plantation, with a ranch-style stone bungalow, masses of roses and swimming pool. Such a surprise. A lady came out from the front door and invited me in. A spacious room resembled a fabulous Hollywood setting, with game trophies, including gorgeous leopard skins, spears and so on decorating the walls.

The charming owner, of German lineage, gave me an insight to the political situation; how long she would be permitted to continue there was in the 'Hands of the Gods'. More regulations and taxes were being levied. If she had to give up, her workers, I am sure, would be no better, if as well off and the tidy rows of coffee shrubs would deteriorate.

Thirteen miles ahead of Mbeya is Salaga Pass, elevation 5900 ft., the highest point on the railway route. It is through the Poroto Mountains, with deep erosions in the volcanic soils. Our next petrol cache was at Makumbako Mission. A jovial rotund Italian 'brother' manned our portable pump while curious children gathered around and watchful white-robed nuns stood in the background.

After a bottle of the brother's cool home-brewed beer, we went on to the Tanganyika Tea Estate to seek accommodation. The manager, Mr. Christan, very kindly offered to take us in as guests. Apprehension of Tanzania's rejection of the British High Commissioner caused our host to send his wife and children to England, therefore we would cause no inconvenience; his cook, house-boy and gardener would care for all of us.

The site was 6350 ft. above sea level, overlooking Mufindi Escarpment. My room, with open fireplace and picture window, was in the front with a view to miles and miles of country with few small plots of cultivation. After evening dinner we relaxed, with liqueurs,

by the living room fireplace, burning eucalyptus logs. Topographical and other conditions thereabout caused us to accept this gracious living for two weeks ... not hard to take at all.

Jan was becoming a bit jittery taking off at this elevation with a full load. I got around that by moving the fuel cache 1000 ft. lower, on the escarpment.

From Makumbako, a descent of 4400 ft. had to be developed, along the face of the escarpment -- very rough terrain, subject to excessive erosion and pock-marked with landslides in the red lateritic soil -- to the Kilombero Valley. Several possibilities were surveyed.

## A Diversion

Soil conditions were so unfavourable for deep excavations and high embankments, that I was happy to have Dr. Tia Laing, specialist in tropical soils, come from Cornell University to proffer his advice. We went over it together, then, in order to reduce the load, I sent Tia alone with Jan. The first day they returned, but by nightfall the next day, they did not. What had happened? Were they down in the jungle? It was my responsibility to find out.

That evening, visits to landing areas which could be reached by Land Rover, enquiries to the Police and long distance phone to Nairobi Air Control were negative. As a check to "Control" in the morning revealed nothing, my thoughts turned to Capt. Cadwallader at Dar. Fortunately he was there and when assured that I was really troubled, he said, "I have to take the President out tomorrow, so have not much time. Will take off now for Sao Hill, meet me there."

There was not much more than time for me to drive to the rough emergency strip, barely safe for a posh fast plane to land on. The Captain came alone; he did not cut off, waved to me to board and we were away. He enquired as to what Jan and Tia had set out to do. After following the route I described, we widened our search to remote Lugala Mission and there was the copter, so we landed.

Jan appeared and said, "Yesterday afternoon my engine was about to fail. For safety I landed here." I asked for Tia and was told that he had left that morning. A young Danish nurse had an old Rover and offered to drive Tia to Mufindi by a round-about trail, 350 miles, whereas the air distance was only 80 miles. It was Thursday. Tia was

due to lecture at Cornell Monday morning.

Captain Cadwallader was indeed true to his word. He returned me to Sao Hill; said there would be a nominal charge, but no bill was ever submitted -- an officer and gentleman.

Tia and his courageous nurse-driver arrived at Mufindi about midnight. Tia, tough and accustomed to travel under all conditions, said, "I do not know how that girl got me through mud holes and over rickety pole bridges. I could not have made it."

After breakfast the nurse left in her old, but faithful vehicle with mechanic Jack as passenger to return to her Mission. Tia went to Iringa to catch a flight at 14:05 hours for Dar and make connections through Nairobi for New York, on time to deliver his scheduled lecture Monday morning.

When Jan arrived, he had a story of troubles. We had a confrontation. Jack informed me there had been little wrong with the copter engine; it would have been safe to continue flight without landing at Lugala. Jan boiled over, "I fly no more." But he was not in a position to take this stand, so he then said there was a crack in the tail rotor. Jack and I could not discover it. Jan was responsible for operation so I sent him by Land Rover to Lusaka for a new rotor, feeling sure that he would not return.

In the meantime, Busby arrived to pick up maps on which I had delineated corridors to be photographed and ground controls surveyed. This occupied our time until a relief copter pilot, Fred Wilcox, ex-Royal Navy, arrived with a new rotor. After an examination with Jack, Fred said he could not discover a flaw. He took the copter up, as was, for a flip or two, landed and said, "Let's go."

The new rotor was not installed. I have flown with many pilots, Jan was the only unpleasant one. It was said that part of his anxiety was that he was aging and had a charming wife in London. Later, Tia told me he had had trouble with Jan in Australia and would rather not have gone up with him. However, as no one was injured, it was an exciting diversion.

Fred was excellent at the controls and a good companion too. There were tricky landings in elephant grass eight feet high to select a bridge site to cross the Mpanda River. We hovered over a family of elephants. A helicopter would appear to be about the only thing that

elephants will run from; nevertheless when a youngster fell, an old bull turned to help it, frightened as they all must have been. This exhibition of devotion impressed me deeply.

Taveta Mission, built of native made bricks, on a knoll overlooking the Mpanda, resembles a miniature castle by the Rhine, excepting it is so isolated. During the rainy season it is cut off, except to travellers on foot, November through to April. We landed there January 24th to be warmly received by the only Europeans, a priest and lay brother from Switzerland. Growth is luxuriant -- oranges, tangerines, mangoes, papaya, bananas, coconuts and casia nuts; flowers are also prolific. Our lunch sandwiches were supplemented with delicious mangoes and we were pressed to stay overnight. These two dedicated men had a one-way radio receiver but no means of broadcasting to the outside.

Kilombero River valley was the next definite feature. It is a giant river with a flood plain thirty miles and water table close to the surface at all seasons, so the native huts are built on stilts about eight feet high. We landed near one to examine the soil. The family head approached and, in fair English, said, "Are you in trouble? Can we help you?" To me this was so magnanimous, especially from one with so little; many with so much could well emulate his example of brotherhood.

Many in this valley, it was said 60 per cent, suffer from bilharzia; infection from snails in stagnant water affects the liver, frequently fatal. At the time there were no injections to be taken against it. Also, there was no immunity against sleeping sickness caused by tsetse flies; one just had to be careful.

Kilombero Sugar Company, with British and Dutch capital, carved out an estate and built a refinery in the valley at Kidatu, the end of an E.A.R. branch line which we tied to, 929 miles from our point of commencement, Kapiri Mposhi.

But there was a 'fly in the ointment'. Zambia Railway was built by the British with gauge 3 ft. 6 ins., whereas E.A.R. was built by Germans, 1 metre gauge, a difference of approximately 3 inches to 'throw a monkey wrench'. Transfer of goods and other methods were studied, finally it was decided to continue the 3 ft. 6 ins. gauge through to dock sides at Dar-es-Salaam, making the total length of

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The Rhodesia Railway was constructed under direction of Cecil Rhodes, circa 1905, for export from the 'Copper Belt' to the Port of Beira, Mozambique. The border between the Republic of Zambia and Rhodesia is the centre of the Zambezi River. This span across the 'Gorge' is 650 ft. long, at a height of 360 ft. above water level, below Victoria Falls. J.L.C. February 1966.

Tan-Zam Railway

Tan-Zam Railway, approximately 1200 miles.[58]

Personal Offsets

Mighty rivers and falls have always acted as magnets on me. Certainly I had to visit Victoria Falls on the Zambezi River, at the border between Zambia and Rhodesia. There are several falls, in all nearly one mile wide, with a drop of 355 feet, discovered by Dr. David Livingstone, 18 November 1855, and named in honour of Queen Victoria. Indigenous natives call it "Mosi-ou-tunya", the smoke that thunders. In sunshine it is arched with kaleidoscopic rainbows.

Rhodesia Railways cross the gorge below the Falls on a span 650 ft., rail level 360 ft. above the water. There is an entrancing view of this from the luxurious colonial style hotel on the Rhodesian side.

Another must was a visit to my only nephew, Keith Charles, retired Lt. Commander Royal Navy, officer i/c Intelligence and Security, Malawi Republic, stationed at Zomba, the beautiful capital at the base of mountains clothed in luxuriant forest growth. The journey was indirect, through Salisbury. Keith resided with his wife and pre-school aged son, also the customary house boys in a pleasant bungalow surrounded by shrubs and flowers. They gave me a very enjoyable long weekend with excursion and picnic by a mountain lake, a grand champagne party and a lunch at the East African Rifles Officers' mess. He remarked, with candour, "The reason I am here is I could not afford to live with this style in England." So true of many retired officers.

Keith was certainly well informed. He knew I had made an unauthorized helicopter landing by the north end of Lake Malawi, and related some weird tales about his duties. For example, a bandit revolutionary raided country stores and was apprehended for trial, and sentenced to be hanged. This generally meant in public, however, the European officials advised it might result in a bad foreign press report, so there was a compromise. Guests would be brought in without fanfare and dispersed in the early morning. Afterwards, during

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[58] J. L. Charles, "Zambia - East Africa Railway Location," Engineering Journal, LI (March, 1968), 21 - 29.

parliamentary proceedings, disposal of the body was discussed. One member suggested the skull should be scraped out and all drink from it; another idea was to tan the hide and hang it in the museum. Calmer heads prevailed, but that was Africa just ten years ago.

## Safari

Although I had seen and photographed herds of game at close range during the railway survey and had no wish to kill -- what would one do with a lion or an elephant? -- I did desire to make a specific photo safari.

When booking at Nairobi for a driver-guide and Land Rover, the girl at the desk remarked that it would be expensive for one person only. I joked, this could be rectified if she would go along with me; the response was a look at my grey hair and a turned up nose!

On arrival by air at Arusha, a smart driver with a nearly new Rover was ready to set out immediately, portending good days ahead.

Soon we saw giraffes, the gentle animal of the plains, stretching their long necks to nibble choice bits on high acacia branches; their long stride, as of slow motion, is very graceful.

Overnight stop was at Lake Manyara, in the famed geological fault Rift Valley. There were many of the common big game, also extraordinary lions relaxing on branches of shade trees. An impala buck, with his shy companions, in the soft rays of sunset presented a delightful picture.

Confusion reigned on the road we left by. Masai had made a night raid on the locals' cattle. Owners and sympathizers milled about, with all manner of ancient weapons, to organize a party to retrieve their animals.

On through great rolling hills, almost mountains, a peak over 10,000 feet, we drove across expanses of open country -- where herds of zebra grazed, keeping a wary watch for hungry lions -- to Ngorongoro Crater, 2000 ft. deep; an extinct volcano; an ideal habitat for most species, also storks and the ever-present scavangers, vultures and hyenas.

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Zambia:- Housing for native workers on an extensive farming estate at Mkushi River, 25th December 1965. J.L.C.



Northern Zambia - a typical native homestead.
J.L.C. photo.

(71) Tanzania:- We established a cache of petrol at Makambako Mission, this jolly 'brother' assisted us to refuel and invited us to partake of his homebrewed beer, 10th January 1966. J.L.C.


LEGEND
RAILWAYS
PROJECTED LINK
Tangier
Algiers
Tunis
Madeira
Canary Isds.
MEDITERRANEAN
Alexandria
MOROCCO
ALGERIA
TUNISIA
LIBYA
Cairo
EGYPT
Aswan
SPANISH SAHARA
SAHARA
RED SEA
Port Sudan
Wadi Halfa
Dakar
MAURITANIA
MALI
SENEGAL
Timbuktu
NIGER
CHAD
Khartoum
SUDAN
Aden
Djibouti
Niger R.
VOLTA R.
Niamey
Fort Lamy
GUINEA
IVORY COAST
GHANA
NIGERIA
CAMEROUN
CENTRAL AFRICAN REP.
Addis Ababa
ETHIOPIA
SOMALIA
Nile
SIERRA LEONE
Monrovia
LIBERIA
Abidjan
Accra
Lagos
Congo River
UGANDA
KENYA
Nairobi
Libreville
GABON
Kisangani
Port Francqui
Kinshasa
Mombasa
Zanzibar
Kidatu
Dar-es-Salaam
Pt. Noire
CABINDA
Matadi
Luanda
Lobito
ATLANTIC
ANGOLA
CONGO
TANZANIA
ZAMBIA
Lusaka
MOZAMBIQUE
Zemba
Salisbury
RHODESIA
Zambezi
Beira
SOUTH WEST AFRICA
BOTSWANA
MADAGASCAR
OCEAN
Lourenco-Marques
NGWANE
AFRICAN REPUBLIC
SOUTH
Cape Town
INDIAN
OCEAN
1. GAMBIA
2. PORT GUINEA
3. TOGO
4. DAHOMEY
5. RIO MUNI
6. RWANDA
7. BURUNDI
8. MALAWI
9. Lubumbashi, Ndola and the "Copper Belt"
AFRICA
MAIN RAILWAYS
AND PROPOSED
ZAMBIA - EAST AFRICA
RAIL LINK, 980 MILES.
BRITISH - CANADIAN
SURVEY 1966.
Plate I
20° W
10°
0°
10°
20°
30°
40°
50° E.
10° E.
20°
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SCALE
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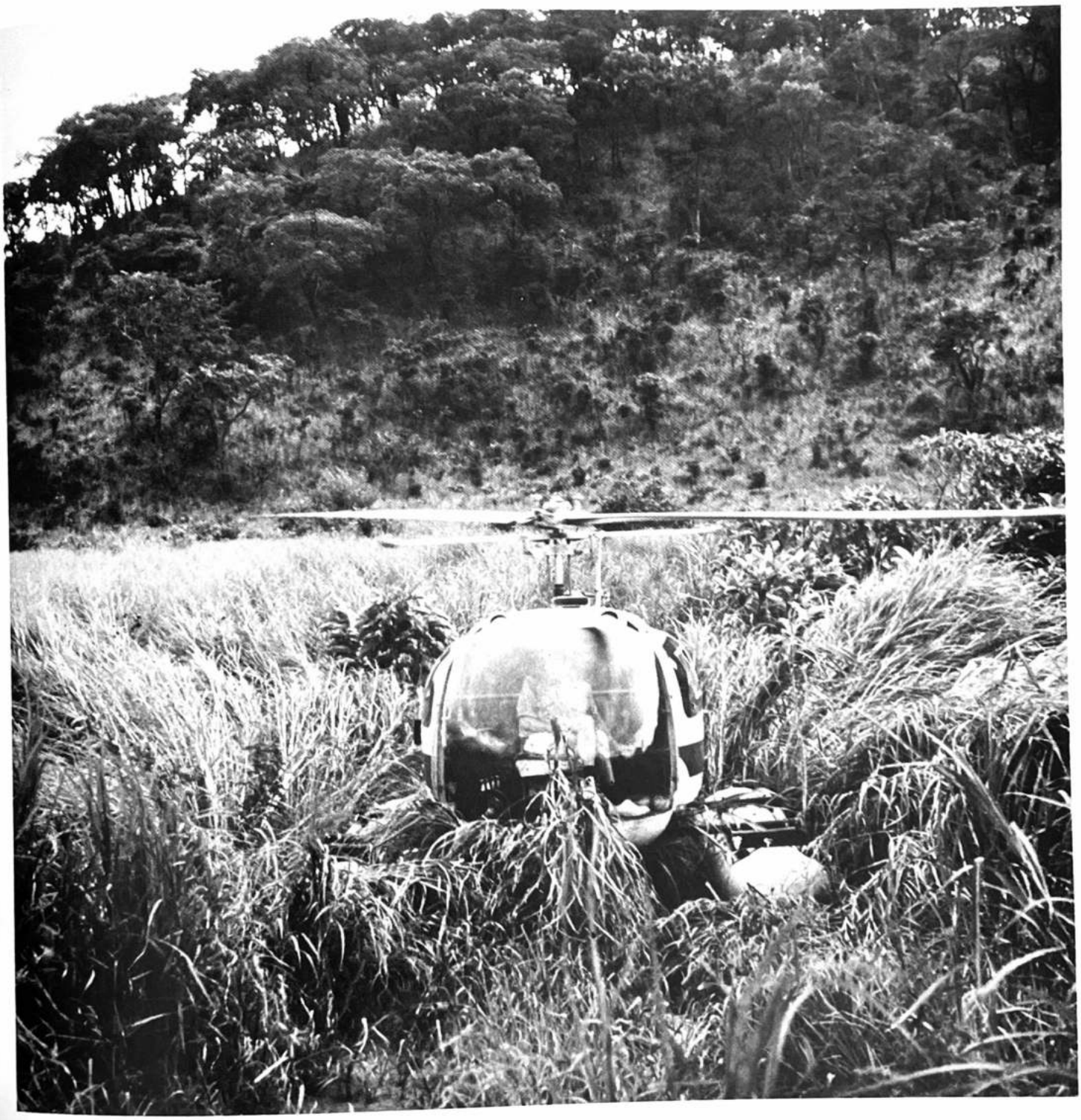
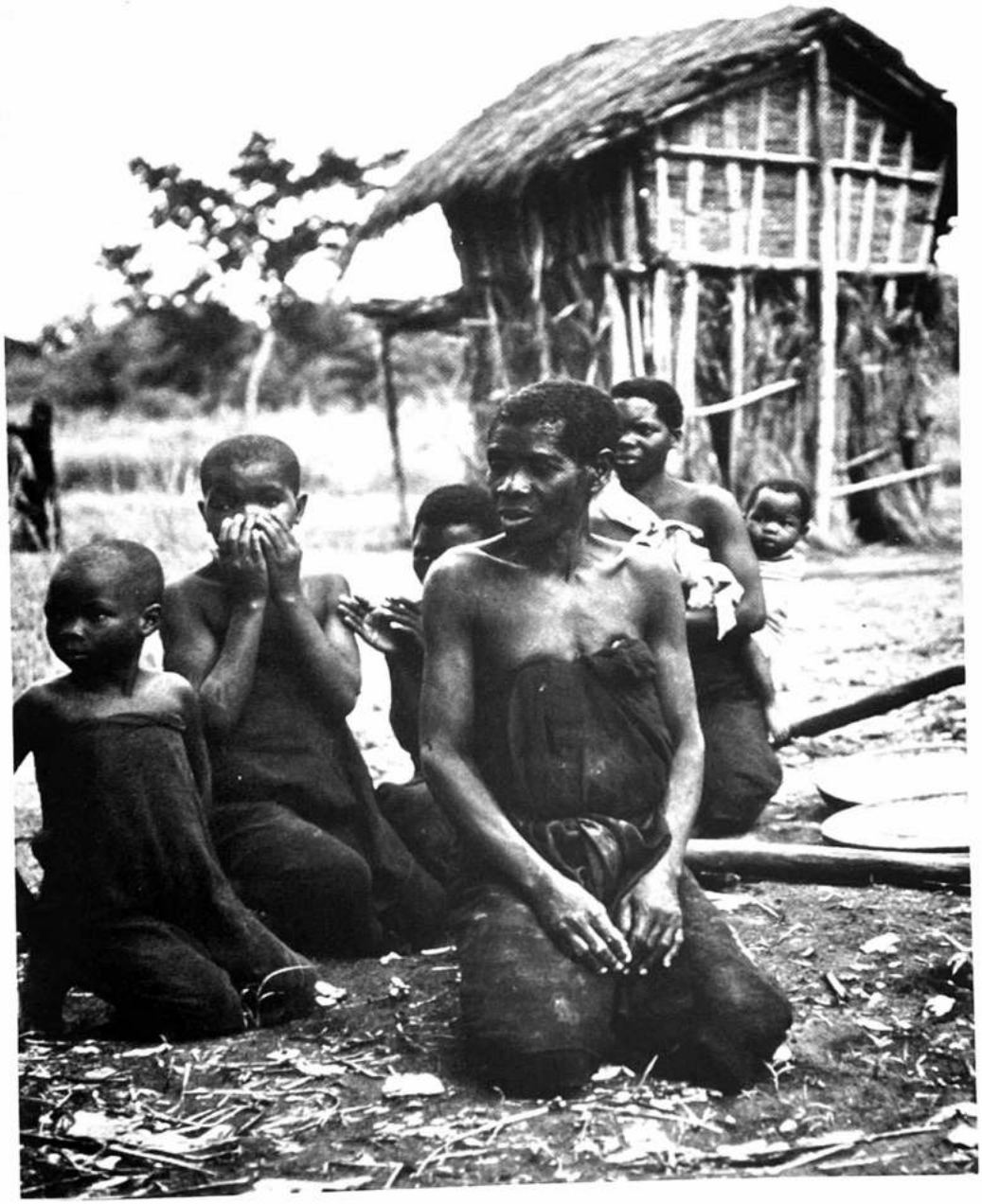
1000
MILES



(73)

Tanzania. Mpanda River Valley, a tricky landing in elephant grass, January 1966. Fred Wilcox pilot. (J.L.C. photo.)

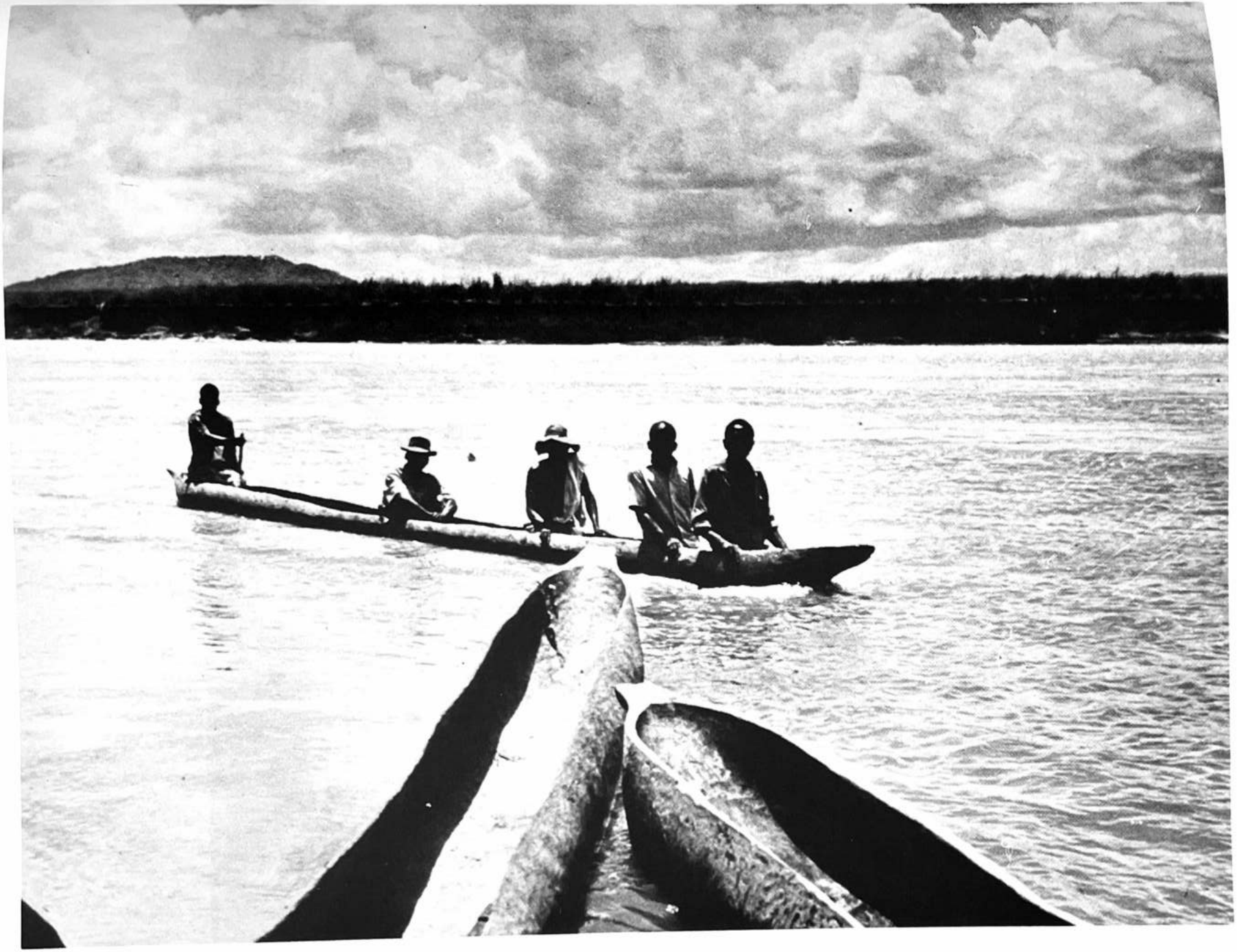
(74) *Tanzania:- It is advisable to be respectful to elephants, expecially large bulls, give them right of way. J.L.C.*



(75)

Tanzania, the Kilombero River Valley is inundated annually and at all seasons the watertable is close to ground level, so family huts are on stilts.
When we landed to examine soil conditions, the 'headman' advanced to greet us saying "Are you in trouble, can we help you" - unforgettable good fellowship, especially considering that these people had so little.

J.L.C.



(76)

Tanzania, Kilombero River, natives fish and hunt crocodiles. J.L.C. photo.

(77) Kalambo Falls a sheer drop of 700 feet into a beautiful gorge thence to Lake Tanganyika, Photo by J.L.C. 31st January 1966.

(78)

Dar-es-Salaam harbour is well protected from the open sea.
Photo from bedroom in the Kilimanjaro Hotel, 4th December 1965.

Tan-Zam Railway

Masai, proud tall warriors, had a compound -- strangely low mud huts within a protective thorn fence. They consider themselves superior and refuse to integrate. They are indeed splendid physical specimens, courageously armed with only a spear. Single-handed, a young warrior will kill lions and also grumpy dangerous rhinos. We saw the near extinct white rhino, a female and calf.

Great herds of wildebeest, up to 40,000, and the pretty little Thompson gazelle graze and migrate over Serengeti Plains, wide open for miles and miles about the south shores of Lake Victoria. Ostriches are very fast, it is just possible to pace them with a Land Rover over rough ground, but fun. My driver was keen at scanning with binoculars; he would spot some lions, throw into gear and race towards them.

During the heat of mid-day, 'prides' sprawl in all manner of positions -- similar to teenage humans on a chesterfield -- in the shade of thorn trees, stomachs distended from last night's kill. Lions hunt in pairs, the lion circles the victim for his mate to kill; then he walks up, cuffs her away and gorges; then she may have some and afterwards it is the cubs' turn -- 'male Utopia'. They permit a vehicle to approach quite closely to regard the occupants with haughty mien. Mature males, with dark manes, are indeed majestic.

Leopards are being ruthlessly poached for their valuable hides, so are difficult to find. Diligent search rewarded us with sight of a female and two cubs; she stood on a branch above them as though posing for the camera. Cheetah, the fleetest runner of all, range widely; it was a disappointment not to come on one, however, the safari was successful in every other respect.

Mr. MacDonald, a Scot born in Tanzania and loving it, said to me at tea in his isolated station near Mufindi, "The mystery of Africa has captivated you too." "Yes, indeed it had!"

Return to Canada

Nairobi airport is a scene of activity. A signpost with arms, shows distances to all important world centres. What we call the observation deck is the waving bay; very descriptive. Passengers of many diverse races come and go in colourful attire; hours may be pleasantly spent there.

Tan-Zam Railway

Cairo was spotted in clear moonlight and the morning was fair for landing at Rome. I stopped off for three days, too brief, to study some of the historical buildings and works of art, also for a tour to Naples and Pompeii.

Departure from Rome was at 5:00k, another fair morning, with short stops at Zurich, London and Prestwick, to take off via the Polar route for Winnipeg, arrival in the afternoon, 16:00k, March 7th, 1966, for a happy reunion with Helena and our family.

Air Photo Study, Mapping and Estimating

Mid-March it was off to Ottawa. In the meantime, aerial photos had been processed for me to study, in stereopairs, and delineate strips to be mapped, project the location and, with the assistance of Jim Thompson, estimate quantities and costs for construction of proposed Tan-Zam Railway. Dr. Tia Laing came for air photo interpretation of soils; and he invited me to describe the project to his students at Cornell.

I wrote of Canada's part in the project for incorporation with economics by Maxwell Stamp, of London. The final report, including twenty-five of my coloured photos, was produced at Ottawa. As to be expected, analysis of potential traffic and revenues was not too favourable with respect to investment, but there were other matters of consequence to be considered -- "In summary therefore, we believe the railway is a feasible and economic proposition. The net additional cost compared with other means of providing transportation facilities which will be required over the next two decades is not all that great compared with the development and political advantages which will accrue."

Presentations made to the World Bank and Western Powers were rejected. The field was wide open for Communism, reference Business International, 22nd September 1967, "Mainland China, Zambia and Tanzania agreed last week that China would foot the whole bill for the Tan-Zam Railway -- Zambian acceptance of the Chinese deal (after cool responses from the World Bank and Western Countries) underlines Zambia's determination to end its dependence on Rhodesia - China's influence in Zambia and Tanzania will be sustained at least until 1975, when the railway is to be completed."[59] This has come about, aided by maps

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[59] "Tan-Zam Railway: Will Red China Pay?" Business International, XIV (September 22, 1967), 299.

and data prepared by the British-Canadian East African Survey.

Chinese have a firm foothold to influence Africans -- what has fate in store for Europeans?

## 22. RAILWAY TO THE ARCTIC

It is a dream of mine that some time the Great Slave Lake Railway may be extended -- as development of resources justify -- from Enterprise, 28 miles south of Hay River, to the Arctic Sea.

This is also envisioned by a group at Queen's University, the Canadian Institute of Guided Ground Transport, under leadership of Professor C. E. Law. His idea is bold -- extend the G.S.L.R. along the Mackenzie River valley to Fort Macpherson, thence westerly along the shore of Beaufort Sea to Prudhoe Bay, Alaska, to transport oil by railway rather than by pipeline to southern markets.

Cecil Law requested me to be associated with his group as Special Consultant. My initial reaction was one of doubt that transport of oil by rail would be viable in comparison with a pipeline. As this was delved into, several features appeared to be favourable to a railway. It would not be limited to carriage of only one product; it could serve the region as a whole and be a trunk for branch lines to mining developments, which it is hoped will come about; construction and operation would be on the surface, not buried in permafrost which would be thawed by hot oil; and more local employment would be created on maintenance and operation.

Also, from experience on the H.B.R. to Churchill, a railway would not damage the ecology -- it has not jeopardized caribou migration. Extensive research and surveys have been conducted, culminating in a comprehensive report, 2 July 1973.

The length of line is estimated 1380 miles, of which 1240 miles would be double track, with capacity equal to a 48-inch pipeline, some two million barrels of oil daily. Bridging would be heavy, other items per mile would not be extraordinary. Climatic conditions are severe but not more so than on the Barrens approaching Churchill. However, the westerly 200 miles would be exposed to winds from the Polar Pack and the terrain about Prudhoe Bay is but a foot or two above high tide, entirely barren of trees, in the condition of permafrost; no more desolate terminal site could be conceived.

### Gas Arctic Northwest Project

Six companies, including Canadian National Railways,

co-operated to form a group, as described in a brochure, "Gas pipeline research in the Arctic Environment". A party of twenty-eight consultants, representatives of respective disciplines, were invited to take part in an aerial tour and surface examinations, to depart from Calgary, 2nd August 1972.

Nordegg Research Site, west of Edmonton, was the first exhibit, then flight over the existing pipeline to Grande Prairie, point of commencement for the proposed pipeline via the Mackenzie River Valley to Prudhoe Bay, Alaska, 1550 miles and contemplated branch line to Canadian Arctic Islands.

Our first overnight stop was at Yellowknife for early take-off next morning to a view, in good visibility, of the Mackenzie, which recalled my earlier journey by tug. At Norman Wells we landed to be shown two research stations, comprising sections of pipeline laid entirely below grade; laid in a shallow ditch half below grade, half above covered with an earth berm; and, entirely on piles above grade; also experimental vegetation plots. Then we continued over the River to Inuvik for a night with but twilight.

Next morning flight took us to Tuktoyaktuk and to drilling operations on islands in Beaufort Sea; then westerly along the foothills of the Brook's Range, parallel to the coast, to Prudhoe Bay, for examination of the elaborate test installations; also to see the huge stockpiles of 48 inch oil pipe and idle heavy equipment awaiting authority to lay the oil pipeline across Alaska to the Pacific Coast port of Valdez -- an investment of millions bringing in no return; on the contrary, demanding millions in interest charges daily.

As mentioned before, the landscape about Prudhoe Bay is indeed ghastly. Offshore, ocean tugs and barges from the Mackenzie River and Tuk-tuk were being discharged; but although August, heavy ice off Point Barrow obstructed passage from the Pacific Ocean and there was little hope that any ships would arrive from West Coast ports this year.

This was a very informative exercise with specialists in a variety of interests and it gave me an opportunity to review Arctic land forms -- permafrost, polygons and pingos -- I saw on reconnaissance, 1963/64.

## 23. SURPRISE!!! - TO BRAZIL

Winnipeg airport, January 1974, returning from a short assignment for Mannix Ltd. in the Foothills west of Rocky Mountain House, Eira met me with news that Vic Cox, V.P., Canac Consultants Ltd., had phoned requesting me to call him. When we got together, I was exhilarated to be asked, "Would you be interested to go to Brazil for three or four weeks, to advise on a railway location project?" My answer was an immediate, "Yes!"

Canac and a Brazilian Engineering Company, Lasa, in a consortium known as Lasa-Canac, had contracted with an agency of the Government of Brazil and United States Steel Corporation to survey the location and estimate the cost for a proposed railway, approximately 900 km, to transport iron ore from a recently discovered deposit, said to be forty billion tonnes of high grade hematite, at Serra dos Carajas in Amazonia.[60]

Being alone, little preparation was necessary. I made a trip to Montreal, had the required shots and was ready to lock my apartment and depart.

It was February 10th that I travelled to Montreal and next afternoon on to New York for transfer to Pan Am overnight flight, nine and a quarter hours. At sunrise, as the Equator and Rio Amazonas were crossed, I had my first view of the vast rain forests of Northern Brazil. After breakfast, hills and suburbs of Rio de Janeiro came into view and at 8:40k landing was made at Galean Airport, hot under cloudless sky. Immigration and Customs officials were not too inquisitive; my passport was stamped "Tourista 90 dias".

Noel Smith, of G.S.L.R. days, now Canac's local manager, was at the exit to take me for an exciting taxi drive, with no regard for safety through congested traffic -- drivers all honking at one another and suddenly changing from lane to lane -- to Hotel de Bret, on Av. Atlantica, parallel to Copacabana Beach. A pleasant suite, two rooms and the largest marble bathtub ever, was made up. Noel advanced me some cruzeiros then left so that I could settle in.

On the beach, hundreds of sun worshippers and devotees of physical culture, with colourful umbrellas, made an attractive picture. The giant statue of "Christ the Redeemer", arms outstretched,

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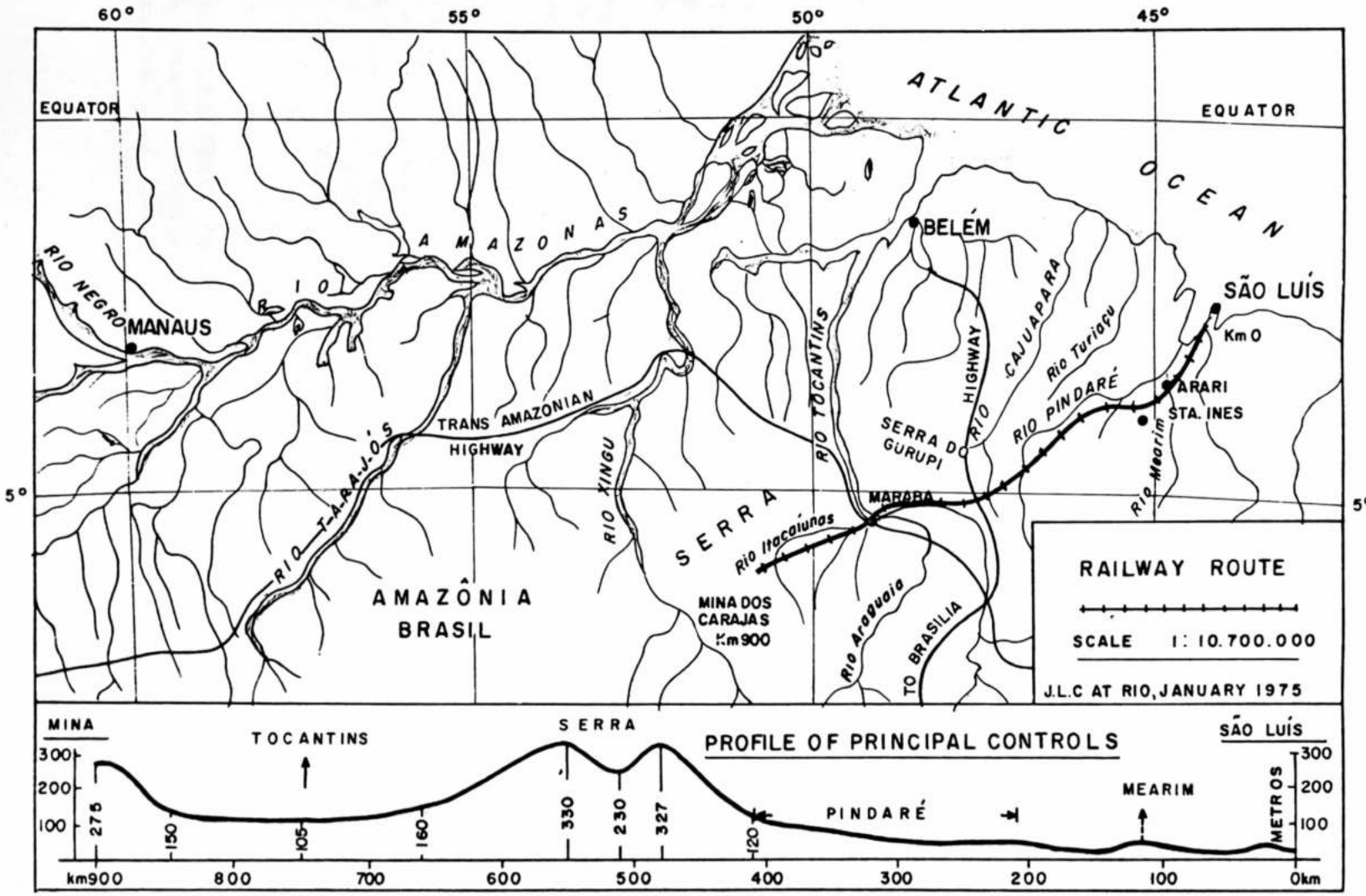
[60] Tonne - metric ton, 2206 lbs.


60°
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EQUATOR
ATLANTIC OCEAN
BELÉM
SÃO LUÍS
Km 0
MANAUS
RIO NEGRO
AMAZONAS
RIO SOLIMÕES
TRANS AMAZONIAN HIGHWAY
RIO TOCANTINS
RIO XINGU
SERRA DO GURUPI
HIGHWAY
RIO CAJUAPARA
Rio Turiaçu
RIO PINDARÉ
ARARI
STA. INES
Rio Mearim
MARABA
Rio Itacaiunas
SERRA
AMAZÔNIA
BRASIL
MINA DOS CARAJAS
Km 900
Rio Araguaia
TO BRASILIA
5°
RAILWAY ROUTE
SCALE 1: 10.700.000
J.L.C AT RIO, JANUARY 1975
PROFILE OF PRINCIPAL CONTROLS
MINA
TOCANTINS
SERRA
PINDARÉ
MEARIM
SÃO LUÍS
METROS
300
200
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dominated all from the Corcovado Peak, 800 meters above the sea.[61]

## The Project

Noel returned, accompanied by Charles Plank, project engineer, to brief me with aid of map produced by a Brazilian Company, using the most up-to-date method, with photographs taken from a satellite. My part in the exercise was to assure that the proposed railway route would be in the most practical location with respect to overall economy of construction, operation and maintenance. This would require study of thousands of aerial photographs, in stereo pairs, and examination of ground conditions, with aid of a light plane and helicopter for observation and landing at specific points. Also, projection of the railway centre line and profile.

It was reassuring to be with former associates ... Noel Smith and Charles Plank, also Andy Brasok, the accountant, and their wives and children. All were very thoughtful and kind, assisting with Portuguese and in other ways too, as when a minute insect bored into my ankle to deposit its eggs. At first it appeared as though I had overexposed on the beach. A red streak advanced up my leg to the groin, then a doctor had to be consulted. He said, "It is delightful here, but there are inconveniences." That was the only one I bumped into. Intestinal parasites are common and may be difficult to dislodge. The Smiths and Brasoks were infected.

In Brazil it is fruitless to be frustrated by delays. A month went by before Noel, Charles and I took off from Rio for Sao Luis, the proposed port for export of ore, kilometre zero of the railway route.

The first 225 km to Santa Ines are through low terrain influenced by tidal flats of Rio Merriam, vast areas are inundated every year. Long hauls will be required for delivery of competent materials for building embankments, also for rock rip-rap to protect the slopes from wave action. A fair proportion of this area is under cultivation, and cattle are raised; water buffalo thrive. A colony of Japanese immigrants are making headway.

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[61] Copacabana Beach is a crescent of sand, 5 km long, between rock points with coastal defence forts. Joggers may time themselves by posts at intervals of 200 metres.

Surprise!!! - To Brazil

Beyond Santa Ines the route ascends the valley of Rio Pindare, a meandering waterway, with lazy flow through dense tropical forest, and is the only access to villages along its banks. The natives subsist on fishing and garden patches. Malaria is prevalent, members of survey parties had to be taken to hospital by helicopter. Most Brazilians do not take preventative medicine, saying it has adverse effects on the liver.

To surmount Serra do Gurupi, between Rio Pindare and Rio Tocantins -- 300 km of extremely rugged terrain, subject to heavy erosion and a watercourse divides the summit into two relative heights -- presented the most difficult problem. It would appear that the original reconnaissance went astray by turning down Rio Cajuapara instead of going over the second height and steep escarpment directly to Rio Tocantins' valley.

I recommended the latter and further that the maximum rate of gradient against outward traffic, loads might not exceed 0.40 per cent compensated and no curve in excess of 3 degrees. This low rate of gradient was attained and the rate of curve bettered, with no curve having a radius of less than 849 metres -- 2 degrees.

Serra do Gurupi is heavily timbered with hardwoods rising to 60 metres, striving for sunlight; under them are secondary trees and entanglement of trailing vines and other dense growth, impassable to travellers on foot without slashing a path with machetes.

And there are very few natural openings to permit landing helicopters. When essential to obtain data, horizontal and vertical positions, for photogrammetry, young bushmen were lowered, by rope, with tools and rations to clear pads; next day we would return to land and lift out the agile axemen.

To avoid cutting miles and miles of traverses to establish the positions of control points, 'Geofix' system -- which operates in conjunction with signals provided by five polar-orbiting navigation satellites, utilizing a receiver, mini-computer and peripheral equipment to establish accurate position fixes -- was employed to supplement generally known survey methods.

The actual railway location, of course, had to be staked on the ground. Cut lines were veritable tunnels through the undergrowth, revealing many exotic plants; however, it is no place for unwary persons.

It was so dense that animals and reptiles slipped away unseen, except when skilfully hunted for their pelts and the pot; the gorgeous jaguar is protected, nevertheless poachers take a chance, to obtain such valuable contraband pelts.

Overhead, colourful butterflies, as large as some birds, flit about the blooms of trees that have pushed up to sunlight and flocks of parrots and lesser birds are prolific.

At the break off from the escarpment, the view of giant Rio Tocantins, flowing towards Amazonas Delta, is a feast for imaginative developers and for artists the blending of colours is superb.

Brazil nuts that appear in our stores for Christmastide, are a product of the rain forest; they grow in fibrous pods the size of a small coconut, eighteen nuts in each pod. When ripe, they fall and are gathered by natives, to be delivered by boat loads at Maraba, a picturesque riverside town, dependent on river transportation, agriculture and logging thereabout.

The railway will cross the Tocantins, a mile upstream from Maraba, with a bridge not less than 2400 metres long. We were fortunate to see this river in full flood. Much of Maraba was inundated, people were being ferried around in gaily-painted dugout canoes, amidst happy confusion as of a country fair; they are river people accustomed to floods.

Not far ahead, the terrain became very rugged and densely forested, approaching the mine site on Serra dos Carajas -- jumbled up country, difficult to recognize particular points. During one reconnaissance by helicopter, clouds obscured everything to force a landing. The Brazilian pilot had extensive experience navigating just above the jungle tree tops. He spotted a native family camp and skilfully landed in the confined area with barely clearance for the rotor blades.

The primitive people offered us water from freshly opened coconuts, also several varieties of fruit, picked then and there, very welcome in the humid heat. They subsisted on fishing, hunting, cultivating a garden patch, a couple of pigs and a few chickens. Their protection against the weather was merely a thatched roof of palm fronds, without walls, however, they had mosquito nets above their hammocks to ward off malaria-bearing mosquitoes. It was interesting to see their hunting gear -- bows, arrows, spears, nets and dugout canoe -- the genuine things far from tourist routes. Jurez, the competent pilot, was also a jolly fellow with entertaining tales of his exploits, not all in the air;

some would be out of place in print!

Before dark, conditions permitted take-off; although visibility was restricted, Jurez avoided hills clothed in mist, to land safely at the mine as darkness closed in.

Iron ore is exposed on the surface. There was a sign, "Welcome -- more iron for the World, more wealth for Brasil." Development activity was all around. United States Steel operated a first-class camp for employees and an excellent guest house built above a sheer cliff, with views of extensive jungle valleys and surrounding heights, habitat of monkeys, gorgeous macaws and many other creatures of the wild.

Aerial photographs were processed and strip maps of the railway route were plotted at Rio and Lasa head office was there too. This was the reason for Lasa-Canac's base being at Rio, 3,140 kilometres from Sao Luis, the point of commencement for the location survey; however, there were daily jet flights between these two cities.

When I became woozy from close application to air photos and contour maps, it was a relief to gaze from my front room to study topography of a different character -- anatomy of hundreds, some days thousands, of alluring humans of all shades, ranging from white through browns to deep black.[62]

Delivery of maps for me to project on was so slow that I was able to take a break to attend the Investiture of the Order of Canada at Ottawa, 3rd April 1974. There was so much spare time that I took a very circuitous route from Rio.

## A Circuitous Journey

The first course was to Brasilia. Although I had had several aerial views, during flights to and from field work, of this new National capital, I wished to drive and walk its streets. The site was selected inland to be more central than Rio and encourage development of the interior towards Amazonia. Virgin jungle had to be cleared before

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[62]There is no colour discrimination, but it is noticeable that street cleaning, delivery of ice to hotels and similar menial jobs are done by 'blacks'.

(84) *Rio Parauapebas flowing through jungle, Serra dos Carajas in the distance; below survey line, a veritable tunnel, cut through dense jungle on Serra do Gurupi, Amazonia.*

(85)

(86) Native boy with a freshly caught predacious piranha; below J.L.C. at the base of forest giant, March 1975.

(87) J.L.C. in Amazonia March 1975

building could be commenced. Subdivision, street planning and architecture are of the highest order, designed for free flow of traffic and outstanding governmental and private edifices, including the president's palace.

Notwithstanding all of this, Brazilians say, "It is a city without soul" and for several years they stubbornly refused to move in until given an ultimatum; as of 1975 the population is approaching one million. The overall scheme is of course very impressive and functional. I was most attracted to the cathedral of circular design, with the roof entirely translucent and but one superb figure suspended above a comparatively plain altar.

At the confluence of Amazonas and the Niger, Manaus, a busy port 1400 km direct airline distance, from Amazonas Delta, was my second stop. The river is about six kilometres wide and sixty metres deep, ocean ships are at the docks and anchored off shore. There are such extremes in seasonal water levels that the wharves are floating.

The rubber barons of the early nineteen hundreds ruled from Manaus. So wealthy that they built an opera house, rivalling some of Europe, and brought in world-renowned artists for their pleasure. After collapse of control of the rubber trade, the majestic structure was not maintained, but recently it has been renovated. The city population is 350,000.[63]

The immensity of Amazonas may be best appreciated from a small boat at the "Meeting of the Waters", where black and beige are absorbed into the whole, and then to a huge backwater "January Lake" for transfer to a canoe to explore some of the thousands of by-channels where the real native life is to be seen.

Giant trees with vines, some with exotic blooms, overhang the waterways, colourful birds and butterflies flit about. At clearings, family huts are on stilts above highwater. Hunting and fishing provide subsistence. Some fish have horrible armour-plated scales. The flesh-devouring piranha swim in schools and strip unfortunate victims to bare bones within seconds. Alligators, boa constrictors and other large snakes are killed for their skins.

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[63]Loren McIntyre, "The Amazon," National Geographic, CXLII (October, 1972), 445 - 495.

Surprise!!! - To Brazil

Waterways break out from deep shade to vast swamps of tangled reeds, so dense as to snarl an outboard motor to a stop, causing unfamiliar travellers to ponder, "How the devil will we get out of here," both wading and swimming would be out of the question. Giant water plants flourish, with circular floating leaves up to two metres across and angelic blooms.

For contrast to the lowlands, of forest and water, I took off for Lima, Peru, parched -- never rains -- at the base of the Andes and facing the Pacific. It was a long way around, through Bogota where officialdom quized my papers, seeming suspicious of a lone Canadian, whereas U.S. citizens were passed without a word. I was obliged to stay overnight, luckily not in jail.

In the morning it was a relief to be given the last vacant seat on the only daily flight south through Quito, with a thirty-minute stop for a bracing walk around the field, 3000 metres above sea level -- for Lima.

It was Saturday afternoon, streets, with high-class stores, were crowded with well-dressed shoppers under surveillance of at least two heavily-armed policemen in each block -- bit of a shock to a Canadian! Apart from the architecture of cathedrals, government buildings and statues, also sentries in magnificient scarlet and white uniforms, brass helmets and black jack boots, Lima did not impress me.

A comparatively short flight with sharp climb of 4,000 metres lands at Cuzco, the old capital of the Incas, in a bowl surrounded by Andean heights.

Splendid examples of Spanish colonial buildings form a square about a well-tended park. The cathedral dominates this far-off mountain city; the altar, a blaze of gold, holds one spellbound. Mass was in progress. I entered a pew and at one juncture was deeply moved when a little old Indian woman, in native shawl, with odour of camp fires, turned around from the pew ahead to embrace me.

Walls of buildings, along typical narrow streets and passages of steep steps, are a blend of incomparable Inca stone masonry and of colonial Spain.

A local railway, with switchbacks to overcome steep gradients, runs daily over the summit of the Andes, then alongside a roaring torrent through a narrow verdant valley to Machupicchu, the "Lost

City of the Incas".

Stepping from the train, there is a feeling of confinement by the almost sheer rock faces, then a rush for seats on vehicles to climb the switchback trail to the ruins high above the valley. The scene is breathtaking. One wonders at the skill of the builders, cutting great blocks of rock and fitting them together so precisely that a sheet of paper cannot be inserted between them; also how they subsisted in such an environment, and ruled until Spaniards ruthlessly conquered them.

It is a spooky place. Had I known accommodation might be available, I would have stayed overnight to ponder on the history -- that the High Inca was tried for being an infidel and sentenced to death by fire, or, by strangulation if he accepted Christianity ... what an option -- and view the ruins and surrounding mountains at night. To return would be worthwhile but there are so many other exciting places to go to and time is closing in.

Back to Cuzco -- another gaze at the golden altar -- and to Lima, then to Mexico City, Toronto, Winnipeg, Ottawa and Montreal, for re-entry to Brazil, 15th April -- "Tourista 90 dias".

## Life in Rio de Janeiro

At Hotel de Bret, apt. 1101 was again assigned to me. Breakfast of fruit juice, eggs, rolls, tropical fruits and coffee was served in the little bar on the second floor, with large sliding plate glass panels facing the ocean. Everyone was so congenial, a grand manner to greet each day. Snacks were served at noon. There was no dining room in the hotel but several close by.

Smiths, Planks and Brasoks invited me to dinner, very thoughtful of them. Smiths' apartment was the entire sixth floor of a block with views of both Copacabana and Ipanema beaches; a cocktail on their verandah was unqualified relaxation. To Planks was an enjoyable walk of nearly three miles, through high-class residential districts; when going, maids were giving children and dogs an outing before sundown; when returning, the maids would be in dark corners with boy-friends.

In contrast to wealth there is dire poverty. Individuals and some families sleep on sidewalks without shelter. Consequently, theft is not uncommon; although I was not held up walking alone at night,

Surprise!!! - To Brazil

Mrs. Plank had 800 cruzeiros snatched at midday in a high-class shopping district. And near her apartment, a young Canadian was shot; when it was reported, the police officer remarked, "That's the sixteenth today."

Rio's population is about five million, squeezed between the sea and rugged hills which subdivide the city into districts linked together by traffic tunnels and viaducts. The popular diversion is sunbathing on the sand; it is impressive that alluring young women, alone, almost nude, are not annoyed by whistles from ill-mannered males.

In Guanabara Bay, the harbour, Ilha Paqueta, with no automobiles, offers quiet relaxation. Excursion boats carry hundreds to and from this haven. On holidays the boats are crowded with working-class people out for fun, singing and dancing; their ability to produce music with anything, just pounding the palms of hands on a wall, is amazing.

Carnival time is February. I was fortunate to be at Rio for two. The city seethes with excitement, day and night, non-stop, for a week. An extravaganza of music and dancing by paraders in gorgeous costumes, in many styles from little more than a string to ornate. Competition runs high between the 'Samba Schools'; they spend months and large funds in preparation.

Jaunts afield

Eduardo Cordeiro and his gracious lady invited me for weekends at his hacienda, in rugged wooded hills, 120 km north of Rio, where he raised cattle and tenants cultivated field crops, principally oranges and bananas; they also produced charcoal.

An ideal layout, around a creek dammed to form a pond, a large central kitchen and dining hall always pleasantly cool even though a wood-burning stove was used; Eduardo's parents' bungalow, and the foreman's home, also two bunkhouses of white masonry and red tile roofs. Eduardo's personal residence was of timber, wide open, no glass in the windows; large shady verandahs for hammocks faced a full-sized swimming pool. Below all, were stables and cattle sheds; milk cows grazed in a green pasture and dignified geese strutted after their leader.

Surprise!!! - To Brazil

Brazilian families are very close knit. Children, brothers, sisters and parents drove out from the City for good companionship and to enjoy country life, with retainers almost part of the family.

Eduardo took me on rides along steep narrow trails through forest and banana groves, across swift running brooks gurgling over rocks, to inspect his cattle on high ranges and to visit his tenants. They were isolated, with no access other than the footpath uphill and down; living quarters, although primitive, were clean. We were served coffee while business and personal matters were discussed; it appeared that Eduardo was highly respected. Prior to the initial ride of four hours, I had not mounted a horse for twenty years, so it was a relief that no stiff muscles nor sore seat developed.

Foz do Iguaçu

Great waterfalls are magnetic, the power of nature inspires imagination. I must view Iguaçu, where Rio Parana constitutes the border of Brazil with Paraguay and Argentina. It may be reached by highway or air; I took a combination of both. From Rio through the industrial city Sao Paulo, pop. 8,000,000, to Curitiba by air to join a group travelling by bus to the Falls and about the region of coffee, sugar, cattle and lumber with several prosperous cities of 500,000 to 1,000,000 population. A larger percentage have pink complexion and fair hair than in the North. At Londrina, a warehouse held one million sacks, each 132 lbs. of coffee.

At Iguaçu there are several high-class hotels and motels. The most lavish is of colonial decor on the Brazilian bank with spectacular views of the horseshoe brink. A river man rowed a fellow traveller and me across the rapids above the falls especially to land on a small island to look directly down, 70 metres, into the roaring cataract, Devil's Throat, with constant rainbow, and the gorge beyond.

Well-maintained foot-paths lead to viewpoints on both the Brazil and Argentina banks. Although the volume and fall are not as great as at Victoria Falls on the Zambezi River, the number of falls, lush tropical growth and overall beauty are as compelling. Time for departure came all too soon.

After dinner the tour crossed Rio Parana into Paraguay. Sunday evening, but all was wide open for business, every store sold liquor, duty free, from Europe. Acaray Casino, on the river bank, hummed with

players -- local and tourists. Croupiers, in black suits, white shirts and narrow black ties, with expressionless countenances, raked in fortunes. Outside, mist from the river and armed soldiers standing in cover of palms and shrubs, created a spectral scene.

The group on the bus, 28 passengers, driver and conductor, was merry with a record player, games and a running discourse of bunkum from the conductor; however, he also gave an insight into the economy of the prosperous south, very interesting to me in contrast to the less developed north, especially the forests of Amazonia.

## Return to Duty

Back at Rio a series of aerial photos and contour maps were at Hotel de Bret for my study before going on another periodical trip to check how the projected line and relative profile fitted on the ground. To me this was the most rewarding phase of our project. Each trip revealed some new aspect.

The air route, 3140 km, between Rio and Sao Luis -- the Atlantic Ocean terminal of the proposed railway -- could be inland via Brasilia or coastal through the port cities of Recife and Fortleza, with views of miles and miles of sand beaches for swimming and sunning.

Sao Luis is a fine example of a colonial port city. It thrived during the era of low cost slave labour but is presently 350,000. It is known as the "City of Tiles" by reason that many buildings are faced with richly-designed ceramic tiles imported from the Netherlands two or three hundred years ago. But, the ordinary red roof tiles are covered with a thick layer of mildew and other fungi from the effects of high temperature and humidity so close to the Equator. Even the once splendid cathedral shows decay. Narrow streets are congested with traffic; carts drawn by emaciated donkeys, goaded by blows from equally miserable drivers, mingle with modern automobiles. Railway traffic and modernization of the port facilities for export of iron ore, will revitalize this city to its former importance, or more so.

Inspection of the Brazilian survey parties staking the projected location usually necessitated travel by highway, light aircraft and helicopter, also sometimes by river boat and, of course, on foot.

Professional engineers are highly respected; all, even new graduates, are addressed as 'Doctor'; on the other hand, run-of-the-mill rodmen, chainmen and axemen, etc. are regarded as mere labour.

Camp accommodation was minimal, just overhead shelters of either canvas or palm fronds on poles to which hammocks were slung. Cooking equipment and supplies were meagre; at one camp, parrots were being eaten. In the dense forest on Serra do Gurupi, water had to be delivered by helicopter.

Consequently, production is relatively slow, an average of 500 metres per day by one party of twenty to thirty men. Procedures are frustrating to observe. Although chaining along a cut line, with stumps and limbs about, is understandably not too accurate and elevations result from where the rod is held, all records were noted to one millimetre and sent to base office to be calculated. Transitmen and levelmen seldom make calculations in the field; so results are slow to obtain. This is the custom so it is advisable for foreigners to accept it gracefully, but it was damned hard to stand by without blowing one's top!

## Tourista 90 dias

As I was unable to obtain a working visa, my stays were restricted to 90 days. This necessitated three round trips to Canada between original entry to Brazil and final departure. One, via Peru, has been described. The next was direct. Another was brought about by CN requesting me to make a joint inspection with Dr. Hardy, renowned soils specialist, of repairs to the Alberta Resources Railway, where extensive sections of track were washed out by the Smoky River.

My departure from Rio was at midnight, 14th December 1974 -- mid-summer, direct to Winnipeg, mid-winter. I changed clothes and continued to Edmonton. Ron Bailey, Regional Chief Engineer, met me and had a helicopter chartered for next morning. Dr. Hardy met us to fly via Edson to inspect repairs, especially rip-rap on the A.R.R., Mile 109 to 170, and return to Edmonton by sunset. Weather conditions could not have been better.

Dean Hardy and I agreed that the works were adequate for future protection of the railway, however, we suggested minor channel diversions of the Smoky River. We submitted our report through Ron to Vice-President Armstrong, to support his rebuttal to the Provincial Government's charge that the rip-rap was not strong enough to withstand possible future floods.

Surprise!!! - To Brazil

I was able to enjoy Christmas dinner with Eira and family at Winnipeg, then left on Boxing Day for Montreal, New York and Rio. A long journey for a four-day job, but which, I trust, has been of service to Canadian National. It will be memorable to me. Views from the helicopter of the Rockies, mantled with fresh snow, like cut jewels in the sunlight, were magnificient and renewal of associations with Bob Hardy and Ron Bailey recalled earlier interesting projects.

Also, my eighty-second birthday, 15th December, was aboard the first-class section of VARIG flight, Rio to New York; dinner was indeed gourmet, from soup to nuts, with excellent champagne and Drambuie liqueur -- a good introduction to another year!

Rio, New Year's Eve

Brazil adheres to the Roman Catholic religion but practices 'Macumba', a combination of Christianity and Paganism, to worship IEMANJA, Goddess of the Sea. Members of this strange, nevertheless fascinating, cult may be seen in groups and individually any evening on the beaches making offerings of flowers and little shrines of lighted candles.

Thousands and thousands gather on Copacabana, Ipanema and other beaches, as far as the eye can see, for special New Year's Eve rituals. Practitioners are all dressed in white, women in voluminous dresses and men in trousers and shirts. Groups of 50 to 100, urban and rural, stake out areas on the sand to erect beautiful shrines of masses of flowers, predominantly white roses, and lighted candles, where they worship, dance and sing, accompanied by African-type drumming to become consumed with ecstasy; it would appear that their convulsions might tear them apart. Some will rush, in a trance, into the surf in danger of drowning but others have more control.

At midnight, each group under direction of its High Priestess or High Priest forms in a procession to carry a small blue and white sail boat -- up to ten feet long, decorated with flowers, candles and nautical flags, loaded with offerings of food and wine -- into the surf and endeavour to launch it, hoping that waves will take it with their wishes for the New Year out to Iemanja at sea.[64]

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[64]Pale blue and white are Iemanja's colours.

During the procession, bottles of champagne are popped; my hair was dowsed. It appeared very wasteful as very little was imbibed, although drumming, dancing and singing continued through the night. The participants are of all ancestry -- white through shades of brown to coal black -- and of all social status. It is a deeply entrancing ceremony.

## Additional Controls Required

When Air Photo produced maps of Serra do Gurupi, between Rio Pindare and Rio Cajuapara, the contours did not appear to represent the topography correctly, so Charles Plank and I went to review the situation. We made our base at Imperatriz, a small town of old-time colour on the bank of Rio Tocantins, with a good landing field and gas cache for our helicopter.

We traversed the densely forested area in question, confirmed our opinion and decided that additional horizontal and vertical controls should be established. No landmarks were visible and no openings for landing. Bushmen, with tools, rations and water, would have to be lowered by rope through the tree tops and vines to clear pads for the helicopter to land us with instruments.

The pilot with us considered this would be too risky with his small helicopter, so Charles and I had to wait at Imperatriz for Jurez, more experienced in such manoeuvres, to arrive from Mina dos Carajas with his more powerful machine. This all required careful planning and to reconnoitre the situation to pin point positions to ensure the safety of the men to be dropped.

After some delay, all was ready. Charles Plank was excellent to assist Jurez in navigation over the sea of tree tops and I was very impressed with the nonchalant manner of the two young Brazilians to be landed by lowering themselves down a dangling rope to the ground. If anything went amiss, there would be little we could do for them. However, all went as planned, and we returned in two days to land, take observations and lift the boys out -- my hat off to them.

At Imperatriz for nine days we had ample time, too much, to look about. The giant Tocantins, with powerful current flowing towards Amazonas Delta never failed to be interesting. Women washed clothes, boys fished and craft took on freight, including cattle, goats and pigs with much shouting, then cast off for up or down river.

Surprise!!! - To Brazil

Streets in town were filthy with gutters, when wet, full of green slime or, when dry, germ-ladened dust was blown around. High temperature prevailed during the two seasons -- rainy, and not so wet.

However, there was one hotel with comfortable rooms and a few miles out of town a restaurant -- just a roof of palm fronds under huge trees, quite picturesque -- specializing in meat. Waiters served, direct to patrons' plates, huge helpings sliced at the table, from roasts on long sword-like skewers, and rice. Although good, there were no varieties and no desserts, just tiny cups of strong sweet coffee -- and, of course, any amount of liquor desired and paid for.

We heard of a restaurant on a river raft, reputed to serve excellent fish. For a change, we took a chance; that was a mistake! During the next two days I used a lot of toilet paper. Malaria was prevalent too, but it could be guarded against by taking pills regularly; I had no trouble.

Our next stop was at Maraba, a similar town farther down river; then we went on to the Mine to enjoy the luxury of the guest house mentioned earlier. We planned to take off at daylight but awoke to hear torrential rain, so were grounded, admiring two gorgeous macaws, until afternoon for flight to Belem, the busy port with population of one million, by the southerly channel of Amazonas Delta, not far upstream from the Atlantic Ocean.

Being almost directly at the Equator, the climate is hot and humid; however, there are modern hotels with air-conditioning and Charles knew of a restaurant on the twenty-eighth floor of a high-rise block, with irresistible view of lights of the city and ships at anchor in the vast river. Next morning we boarded a regular flight to Rio. This terminated my final inspection of the proposed railway location -- March 1975.

Last weeks in Rio

Revised strip maps of Serra do Gurupi were plotted, then it was up to me to project the location and profile. This completed my participation in the project. However, there were a few things to attend to.

One was to consult travel agents in the heart of the business district, alive with people bustling on wide streets and sidewalks

from place to place. Suits and neckties are worn in contrast to the carefree attire of Copacabana. Stately old churches are amongst modern high-rise buildings, some very striking. The office I visited was on the thirty-fourth floor with outlook to the old masonry aqueduct, alongside the new majestic cathedral nearing completion, and beyond to the rugged hills ringing the city.

Of course, there were gifts to be purchased. High-class dealers in the many brilliant gems of Brazil are handy along Av. Atlantica facing Copacabana Beach; just to view these displays is a feast for one's eyes. Eventually their beauty will compel buying, might as well, as cruzeiros are worthless to take away; however, there are means to exchange them without heavy loss. A jeweller from whom I bought a teardrop aquamarine, 14 carats of captivating ocean blue, set in white gold as a pendant, offered me U.S. travellers' cheques he had accepted from tourists, at a discount of 10 per cent, a reasonable deal. Also, package tours may be paid for with cruzeiros.

From my window, the beach and surf always beckoned; one day especially with temperature 40°C. Foolishly I went in bare feet. Av. Atlantica consists of six paved traffic lanes, with wide median and esplanades each side. They were burning! To cross I threw down my towel and beach mat, alternatively, and likewise to return to the hotel. The waiters in the bar watched my ludicrous antics, hopping from foot to foot, like a cat on hot bricks; they were friendly fellows and had much fun mimicking and kidding me.

So that I would carry away thoughts of life on an hacienda, Eduardo picked me up to drive for another visit with his family and to ride with him to see more expansive views, from hilltops, over forests and vales. We were caught by violent rain but what matter, it was warm and light clothes dry quickly. It was a delightful weekend.[65]

On my last day, Andy and Carol Brasok took me to lunch at their club with beautiful swimming pool and gardens in the lush tropical forest high on the hillside overlooking residential areas to the sparkling ocean. Noel and Sheila Smith invited me to have a cocktail

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[65]Dr. Eduardo Barbosa Cordeiro, civil engineer, was manager of Lasa-Canac; he regularly lectured at two Rio universities, also conducted a private practice and his hacienda -- a gentleman of substance and charm, under forty.

on their verandah, with shipping passing by, and dinner. Charles and Margaret Plank kindly accompanied me to the airport.

"Cariocas" are indeed entitled to call their home, Cidade Maravilhosa, watched over by the giant statue of 'Christ the Redeemer' on Corcovado Rock, which will be a vision to me for the years I may yet be granted.[66]

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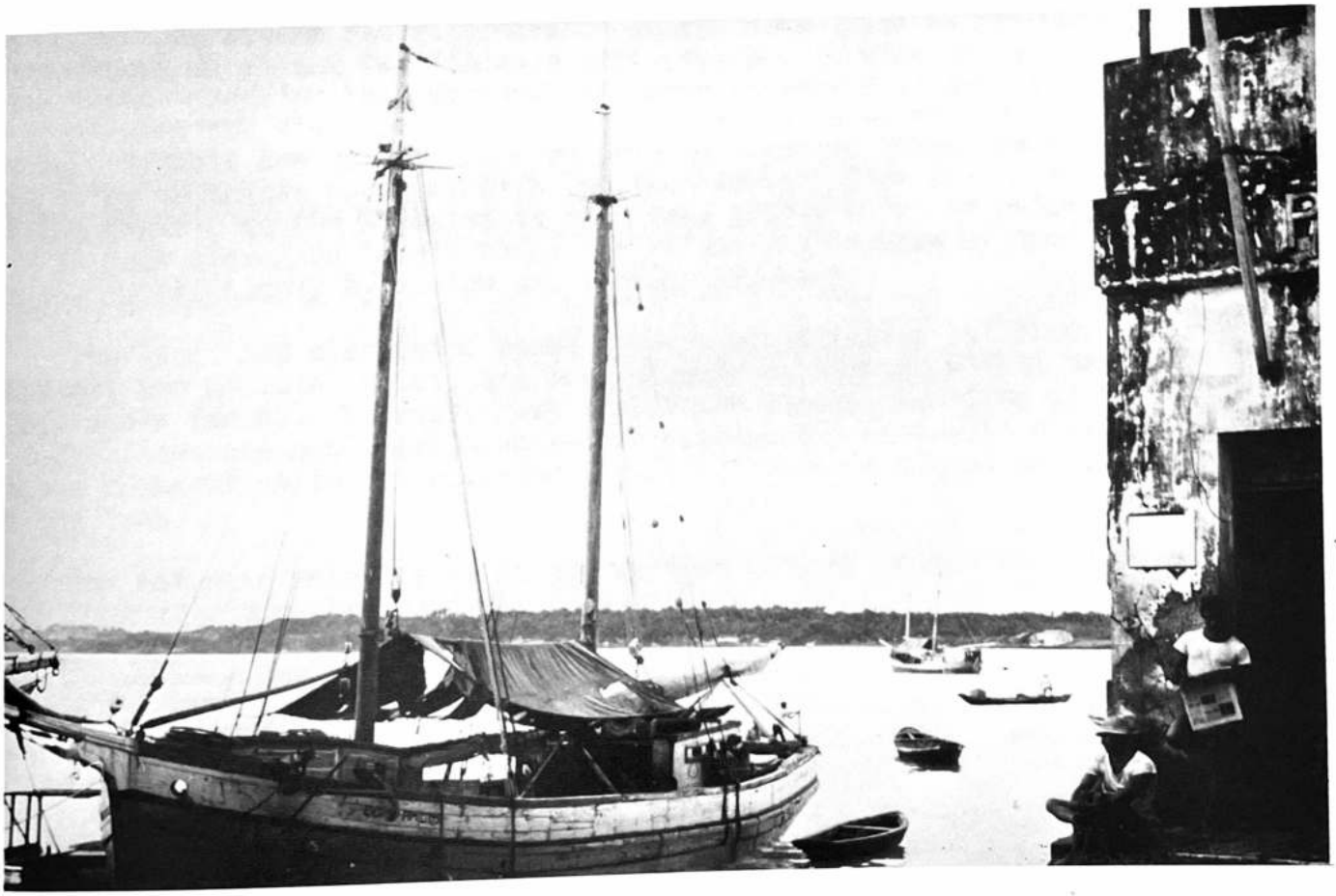
[66]Residents of Rio are termed "Cariocas".

(80) Dr. Eduardo Barbosa Cordeiro, Engenneiro Civil, inspecting his frezenda; above one of his tenant's homestead central Brasil. The following seven photos taken by J.L.C.

(81)

(82) Sao Luis inner harbour, latitude 2 degrees south, effects of high temperature and humidity discolour buildings; above Rio Tocantins one of the giant tributaries to Amazonas Delta.



(83)

## 24. FROM BRAZIL TO CANADA

Homeward journey made it possible for me to fulfil a long-awaited desire to see the Panama Canal and the Mayan Pyramids in Guatemala, without much additional airfare.

### Panama

Flight departure from Rio was midnight; at dawn the plane set down at Caracas, Venezuela, where it was necessary to transfer for Panama City, arrival about noon. A smart military guard was at attention and the band played; I thought,"This is a special welcome," but my ego was deflated when it was evident that it was not for a lone Canadian, but for presidents of other Central American States gathering for a conference.

After luncheon, a school teacher, part-time taxi driver, gave me a brief, nevertheless, informative tour of old Panama. Henry Morgan, later Sir Henry, certainly gave the Spaniards a working over there, but the gold altar was saved and is to be seen in an old mid-town church, but it did not impress me as much as the gold altar at Cuzco, capital of the Incas, in Peru. We drove through up-to-date residential districts too; as it was the annual dry season gardens were parched.

Next morning, my guide called with his late model Impala to take me to Balboa, at the Pacific entrance to the Canal, and to the Canal Zone, where excellent facilities enable visitors to view the gargantuan locks. Earlier that morning the Queen Elizabeth II passed through with but five inches to spare within the walls of Miraflores Locks. Vessels are guided and propelled by electric locomotives operating on tracks parallel with the lock walls. From deep water of the Pacific to the Atlantic is 50 miles, thirty miles of which are 85 feet above sea level; ships are raised and lowered by operation of the locks, simply by inflow and outflow of water.

The locks and everything about them, administrative buildings, barracks and official homes, are scrupulously maintained within heavy steel chain fences. Whereas, just across the street, old-time stores and dwellings are neglected. No wonder Panamanians look with envy at the comparative luxury accorded to U.S. citizens assigned to duty in the Zone.

The Atlantic entrance is at the ancient city of Colon, not very

attractive and said to be infested with thieves, so much so that it is not safe for strangers to walk the streets at any time.

## San Blas Islands

From Panama City, a flight by light aircraft for thirty minutes, across the Isthmus and over Colon, lands on Provenir Island; the strip cleared of palms, water to water, is barely enough for safety. In fact, I watched one incoming pilot attempt three times before he made it.

A native took me for a ten-minute ride in a dug-out, with out-board motor, to Anai where I was to have room and board at Posada Inn -- two flimsy storeys of bamboo and palm with kitchen close by, joined by overhead shelter of palm; underneath hammocks swung wide open to the sea. However, each bedroom had a shower and flush toilet, but use was restricted to certain times. In between, if calls of nature became urgent, there was a typical outhouse, on stilts; action was direct; fish in the crystal clear water scattered in all directions!

These islands are of sand, no more than four feet above high tide, covered by coconut palms. They number, in all, 366 within a distance of one hundred miles towards Colombia. About fifty are populated by 21,000 Cuna Indians.

Their skill sailing dug-out canoes, without keel or outriggers, and only a paddle for rudder, tacking into the wind is amazing. They subsist on fish -- barracuda, lobsters and other species are plentiful; also, they tend their coconut palms and a few chicken and pigs. Inter-island traders call for the copra produced.

Fifty years ago the Cunas revolted against Panamanian Colonial Police and are determined to resist outside interference. Women dominate Cuna society, they have prestige and authority; the eldest woman conducts the family business; lineage is through the mothers and daughters are considered economic assets.

They are faithful to traditional costume and their needlework is very skilful, especially on 'molas', unique rectangles of cotton fabrics worked in colourful designs reflecting events in Cuna life -- animals, birds and fish -- to decorate the breast of blouses, sought by collectors.

Features of Cuna women are favourable; all have a black stripe painted from their forehead to nose tip and wear a gold nose ring, multicoloured bead necklaces, and they sheath their naturally delicate forearms, calves and ankles. Savings are converted into huge ornaments, bangles and earrings of hammered gold.

Excursions in dug-outs were made to several islands. One, quite distant, with some rough sea to cross, was a miniature dreamland of white sand with graceful swaying palms overhanging the bluest and clearest water imaginable. Only one family lived on this heavenly isle, but the waters about are not always serene; ghosts in steel hulks rusting on coral reefs bespeak tragedies.

About fifty families occupied Wichub-Wala. Some had albinos, called moon children, so strangely different from their brothers and sisters. Where there are so many families, grade schools are opened and graduates may go to high school in Panama City.

At last I was physically in a pure environment of tropical sea, sand and palms with friendly Indians, to sail, bask, swim, eat, drink and sleep, as had been a dream. A week passed all too quickly. I was loath to leave and would have stayed longer if I had not had reservations ahead.

## Taboga Island

Back in Panama City, school teacher-taxi driver took me early in the morning to the docks at Balboa to queue up with passengers, of all degrees of society, some for a day excursion and others going home to Taboga, off the Pacific entrance to the Canal.

Weather was perfect but otherwise everything was so different from San Blas. Taboga is a sophisticated resort with modern hotels and people found anywhere. The range of tide is much higher and water temperature was not so warm.

It was enjoyable but not for more than one day; however the return passage was memorable ... to view ships making for the Canal, and to pass under the Thatcher Bridge to dock at Balboa at sunset.

From Brazil to Canada

Guatemala

From Panama City, a daytime flight took me to Guatemala City, with an intermediate stop at San Jose, Costa Rica. At the western region of Panama, there are mountains eleven to twelve thousand feet high, and the same range extends into Costa Rica, all very interesting.

There is no reason to question the six million people of Guatemala, that it is, "Land of Eternal Spring". This was confirmed as I was shown into my 'luxury' hotel room; the entire front wall was window, facing a large swimming pool surrounded by gorgeous flowers and majestic trees. I could not have desired more, and it was a relief to note the rate, including breakfast, was 22 quetzals.[67]

The site is on Paseo de la Reforma, with wide boulevards, well treed, between traffic lanes and sidewalks and statues in the circles at main intersections. A pleasant prospect for a stroll, either midday, when it is moderately hot, or in the warm evenings of this city 4900 feet above sea level.

As it was Holy Week, most business was at a standstill. On the other hand, the religious processions and obvious devotion of the populace were very moving.

On the Saturday I took a day drive, through rugged wooded hill country, uphill and down, to the former capital, Antigua, 7000 feet above sea level, in shadow of extinct volcanoes rising to 12,000 feet. A vision into Colonial Spain, cobblestone streets with massive walled one-storey houses built around a central patio with masses of flowers and, inside, splendid furniture and works of art.

Churches of exquisite architecture galore, some in decay but two or three in good repair. In one I witnessed preparations for a procession. The participants, of dark Indian countenance, robed in deep black, shouldered a massive altar with a figure of Christ bearing a heavy wooden cross. They proceeded to the street followed by women and girls, also entirely in black, and a band playing a dirge.

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[67] Currency is named for the beautiful national bird Quetzal, about the size of a pigeon, green with a red breast and extraordinary long tail. 1 quetzal equals 1 U.S. dollar. Canadian money was refused.

The dark skin of the bearers in black habits, and their dedicated mien, was somewhat frightening. They made a circuit of the city, on streets where intricate designs had been laid with coloured sand and sawdust by fervent artists for hours, to be destroyed by hundreds of footsteps within minutes.

The square adjacent to the cathedral was jammed with merchants' booths displaying all manner of souvenirs and snacks. Young women with babies, in traditional multi-coloured costumes and men too, easily pleased with a few small coins, willingly posed for camera enthusiasts.

Conditions in the countryside are excellent for production of high grade coffee. An excellent buffet luncheon was obtainable at reasonable price in an inn built about a quadrangle with central fountain and radiant flowers. Rate for a single room was but fourteen quetzals in this luxuriant situation, perhaps a good place to retire in if fluent in Spanish.

The northern region of Guatemala, the lowland, was the home of Mayan culture and construction of the massive complex of temples and stelae, huge stone pillars inscribed with hieroglyphics about year 700 After Christ. To see these ancient wonders, which were suddenly deserted by their builders -- no one knows why -- I went by bush plane, reminiscent of northern Canada, with passengers and cargo together, 200 miles to Tikal, discovered to the world outside in 1852.

Temple No. 1, known as the "Great Jaguar", 45 metres high, and Temple No. II face one another across Plaza Malfor; they, and relative structures on the other side of the Plaza, are cleared from dense jungle entanglement, and the heads of Temples III and IV may also be seen. It is an astonishing experience. Why the Mayans -- advanced in mathematics, astronomy and arts -- abandoned their amazing works is but speculation.

Facilities at Guatemala air terminal, for arrival and departure, are the most convenient I have encountered; every move is arranged in logical sequence. I had a direct flight to New York for transfer for Montreal where certain formalities -- medical check against tropical diseases, etc. -- had to be conformed with, then to Winnipeg, 5th April 1975, completing the assignment expected to be for three or four weeks, actually extended to thirteen months... all enjoyable and informative.

25. RETIREMENT

Four senior officers of the Western Region, Gavin Baird, Manager of Real Estate, Les Fonger, Freight Traffic Manager, Frank Keefe, General Manager and I reached the age of 65 years, normal for retirement about the same time.

The late Mr. Wm. Burns, Engineer of Construction, whom I admired, served the C.N.R. until he was seventy; I hoped to emulate him. Fortunately, I was given that privilege, plus two years -- fifty-five years from entering the Engineering Department of the G.T.P.R. at Edmonton, 1st April 1910.

Many friends from coast to coast honoured me at dinner in the Hotel Fort Garry, April 7, 1965. Looking about at the familiar faces, flashes appeared of co-operative hard work and good times; also I had thoughts of ones gone to happy hunting grounds, especially L. E. Silcox, L. C. Gunn, Wm. Burns, H. A. Dixon and E. M. M. Hill, who gave me so much professional guidance and in general propriety during early years -- I certainly needed it.

Mr. S. F. Dingle, System V. P., spoke of many personal events and brought felicitations from President Gordon. Stan did not forget Helena -- he praised her devotion, foregoing much normal family and social life, which permitted me to pursue my career.

Bill Walkden welcomed me into the ranks of pensioners. Alton Johnston, System Chief Engineer, spoke for the profession. A letter from Charlie Smith, V. P. of the B. of M. Employees, regretting he was unable to be present, was read, together with many other letters and telegrams wishing good health and happiness to Lena and me.

Nine one-time Western Region district engineers -- Ben Chappell, Joe Conrad, Ed English, Jack Cann, Jack Spicer, Frank Farish, Ray Fisk, Ron Bailey and Doug Worby jointly prepared a unique epitome "Closing the Traverse", quoting Robert Burns,

> "O wad some Pow'r the giftie gie us
> to see ourselves as other see us!
>
> It wad frae mony a blunder free us,
> and foolish notion."[68]

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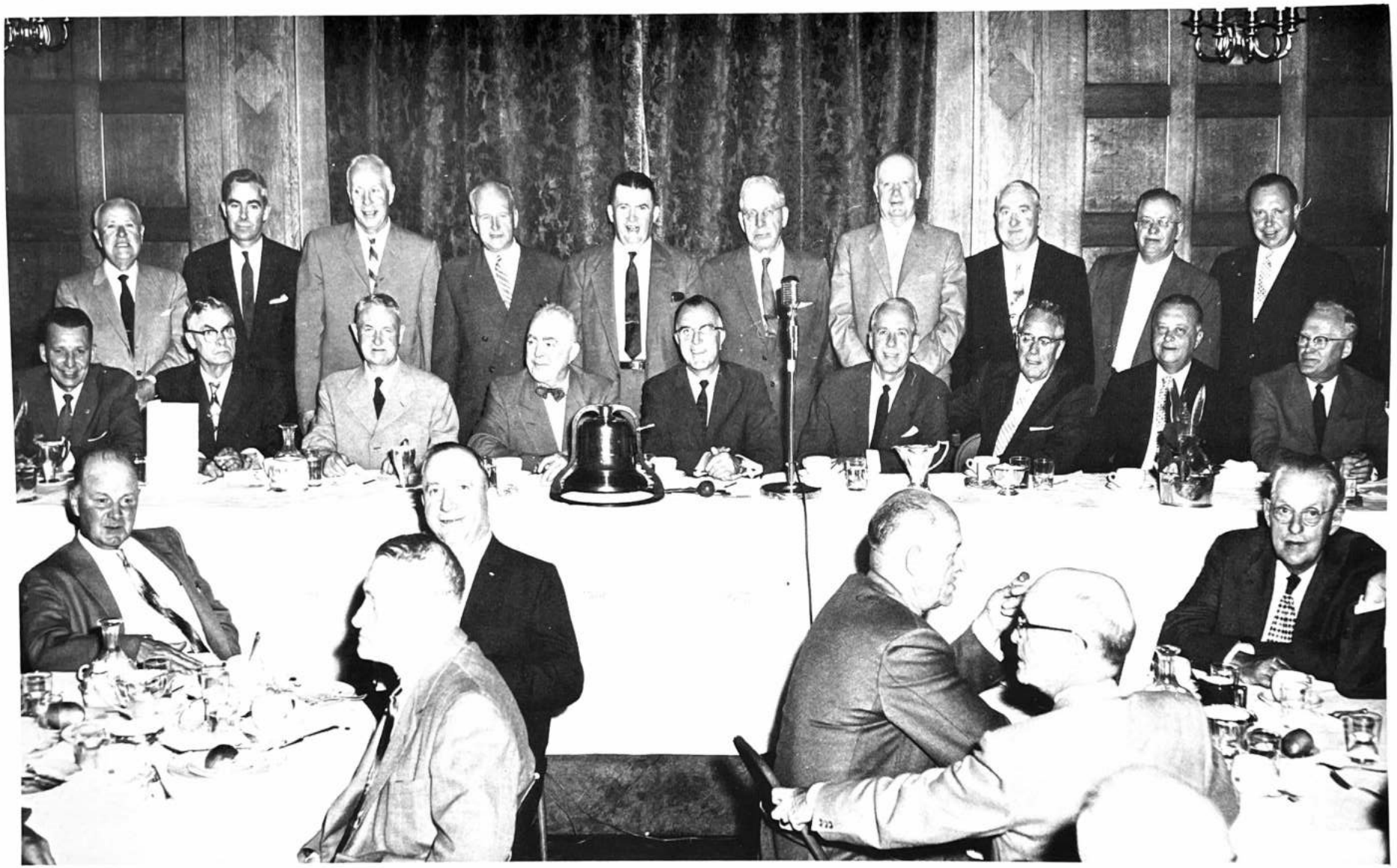
[68] Robert Burns, "To a Louse, On Seeing One on a Lady's Bonnet at Church," Poems and Songs (New York: Oxford University Press, 1969), 156.



(53) Dinner in honour of Mr. F.H. Keefe, General Manager Western Region, at Winnipeg, 26 June 1958; the 'Gang' was there in force. standing left to right - H. Baker, G. Keefe, B. Chappell, O.E. Berringer, W. MacPherson, W. McSparron, I. Lucas, C.C. Williams, R.A. Graven D. Healy. seated - H. Hutton, F. Musgrave, J.L. Charles, F.H. Keefe, J.R. McMillan (chairman), S.F. Dingle, D.G. Robb, F.N. McKenzie, L. Fonger and many others.

Retirement

This little volume contains a photo of each contributor and his recollections of our work together, all artistically bound for presentation. I value it very much and trust it will be a family heirloom. Helena knew these fine young fellows and had many a laugh with them during inspection trips and appreciated their comments and reference to Robert Burns' homely verse, which she, too, often quoted to deflate my ego.

A Browning, over and under, 12 gauge shot gun -- a superb example of gunsmiths' craftmanship -- was presented by Ron Bailey on behalf of all my friends within and associated with the Canadian National Railways. This gun is so highly finished and engraved that I 'feel' for it when in a muddy goose or duck blind, however, it is carefully cleaned and oiled after each outing. The perfect shot patterns, from both barrels, bring down the birds, if my aim and lead are accurate. Indeed it will be treasured; guns have been dear to me from boyhood. I thank all for such thoughtfulness.

And, too, the survey instruments and snowshoes, set about the table, were significant of life I enjoyed so much, with the assistance of many staunch fellows, a number of whom joined the Western Region after demobilization in 1945; it gives me heartfelt satisfaction to congratulate them on the degrees of responsibility all have attained; two are Regional Chief Engineers and four are Vice-Presidents.

Also, I am grateful for,

Friendship of fellow railroaders; and, that I retired as Chief Engineer of the Western Region before it was divided into two.

Freedom along the trails and waterways amidst the exhilarating scenery and wildlife of our wide open lands, prairies, forests, tundras and mountains.

Fellowship at Norwood Masonic Lodge and at St. George's Anglican Church; also, with 'Old Soldiers' at the Legion, Valour Road Branch, and as member of the Executive Committee of the Board of Governors, Corps of Commissionaires.

Being elected to President of the Association of Professional Engineers of the Province of Manitoba and Chairman of the Winnipeg Branch of the Engineering Institute of Canada. And, being awarded 'Honorary' Life Membership in A.P.E.M.; also, for being granted Life Membership in E.I.C. and the American Railway Engineering Association.

Retirement

The Julian C. Smith Memorial Award, for "Achievement in the Development of Canada", from the E.I.C. at the annual banquet, Halifax, 1968.

Honorary degree, Doctor of Laws, from the University of Manitoba, at the Fall Convocation, 1973.

Invested to be an "Officer in the Order of Canada" by Governor General Rt. Hon. Jules Léger, at Ottawa, April 3, 1974. In protocol, this is senior to the "Distinguished Service Order" which I received from King George V at Buckingham Palace during World War I.

Good health to practice engineering, in the field at age 82 years.

Above all, for the loving direction by Helena throughout our fifty-seven years of marriage. It is lonely without Lena; however, our daughter Eira (Babs) and Rhiney, her husband, together with grandchildren John, Bruce, Gordon and Leslie Anne bridge the chasm with kindness.

Each Fall, a third-year student in Engineering or Geology, entering fourth year at the University of Manitoba, is presented with the "Canada Northlands Development Award" -- interest on a fund established together with my late wife, in memory of our son John who gave his life in action with the R.C.A.F., over Cologne, 31 May 1942. This is administered jointly by the Association of Professional Engineers and the Faculty.

Heeding the slogan, "Go West, Young Man, Go West" has given me all I dreamed of at that time but the urge to travel strange by-ways is not quenched.

Subject to the will of the "Great Architect", I plan to head out from Vancouver to have my eighty-third birthday by a palm-fringed beach on Bora-Bora, thence by way of other South Pacific Islands to New Zealand and visit engineer grandson Bruce and wife at Perth, Australia.

And, if inflation does not cut off my means, complete the 'Circle' -- through Indonesia, India, the mid-East, and Europe -- to revisit Rheinberg Cemetery with respect to John, and then my own niece, Priscilla Rose, and her family in the Western Highlands of Scotland.

(88) Major John Leslie Charles, O.C., D.S.O., LL.D., P.Eng.

## PART II

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