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October 14, 1952

GEOLOGICAL RECONNAISSANCE OF A PORTION OF THE HESS MOUNTAINS AND  
STEWART PLATEAU, YUKON

Introduction

PROJECT

During the summer of 1952, between June 24th to September 17th, the area between the Canol Road at mileage 260 from Johnson's Crossing and Mayo Landing was traversed. This area breached the gap between E. D. Kindle's map sheet (Geological Survey of Canada, Paper 45-21) and that of H. S. Bostock (Geological Survey of Canada, Map 890-A). The purpose of this expedition was to attempt to find areas into which prospecting parties might intelligently be sent in the future, as well as to investigate the Hudson Bay Exploration and Development find on the Canol Road.

The party that undertook the project consisted of a trapper that had travelled over a portion of the area, two native packers and the writer. Transportation was supplied by ten pack horses. Our food supply was replenished at midseason on Niddery Lake by aircraft.

The route followed was via the Canol Road to Jeff Lake (Mi.260), along the valley of Moday Creek to William Lake over the mountains to the north branch of the Selwyn River, to Sunset Mtn., Niddery Lake, Hess River Valley, to 5 mile Canyon, to headwaters of Husky Dog in Cache Creeks, Fairweather Lake, Barr Creek, Russell Range, Russell Creek, Hess Big Bend, Stewart River, Mayo Landing.

The mountains in the area traversed, with the exception of the Russell Range, consisted of clusters of peaks separated by broad rolling uplands, rather than distinct ranges. The Russell Range is composed of a considerable area of mountains, all of

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approximately the same elevation (6,000') and separated by narrow v-shaped valleys. Some of the individual peaks in the rest of the area attained elevations in the neighbourhood of 7,500'. The peaks with elevations greater than 6,000' feet contained alpine glaciers. This was particularly true of the peaks near the continental divide.

The tree growth varied from large spruce and poplar in the flood plane of the Hess through stunted spruce and balsam up to an elevation of 4,700'. A thick growth of alders and willows, growing from a deep mat of moss, persisted on most slopes but appeared to be thickest on the north hillsides. Black and red currants as well as high and low bush cranberries were found in abundance along the Hess River, while blackberries and mossberries were encountered on intermediate uplands.

The wild life throughout the area is not plentiful, certainly not sufficient for a reliable meat supply. During the summer, four grizzly bears and one black bear were seen, as well as twenty-four caribou, six moose, ten sheep and one wolverine. Arctic greyling were plentiful in some streams below 4,000', and one lake containing Lake Trout was found. No salmon were found as it is impossible for them to migrate above Fraser Falls on the Stewart River.

#### General Geology

The area traversed is composed for the most part of sedimentary rocks that are classified in ascending age from the

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Carboniferous along the Canol Road (E. D. Kindle G. S. C. Paper 45-21) to the lower Paleozoic and/or Pre-Cambrian in the Mayo area (H. S. Bostock G. S. C. Map 890A.) As detailed stratigraphic work would be necessary to ascertain the exact geologic age of the sediments over the area, and time would not permit this, the rocks were classified as Yukon series, Paleozoic, and Cretaceous (?) Granites. With respect to the age of the sediments, one fact did appear quite evident - the rocks become progressively older as one proceeds from the Canol Road to the Stewart River. The intrusive granites in the area were observed to be younger than any of the sedimentary strata present.

Yukon Series

This group of rocks is a highly metamorphosed assemblage consisting of graphite, chlorite and sericite schists and quartzite. It has been highly tilted and folded, and generally speaking they dip at angles close to vertical and vary greatly in strike. The one marked exception to this is the Russell Range. These mountains consist of chlorite and sericite schists that are lying horizontally. The Hess River, as far up as the junction of the Selwyn with it, had cut down to this series of rocks. One characteristic feature of this series is the abundance of quartz stringers that seem selective of this group.

Paleozoic Series

Rocks of this group encountered were relatively unaltered and strike from east west to N.70°E. They dip generally at

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angles of less than  $40^{\circ}$  to the S. except near intrusives where they become complexly folded and distorted. The older group overlying the Yukon series unconformably consists of quartzite, grit, conglomerate and slate with one narrow limestone band. This type is well exposed in the mountains between Triad Mtn., and the headwaters of Husky Dog Creek. The conglomerate of this age is a grey blue type that is quite siliceous and, due to its competency, forms the backbone of many of the mountains in this area.

Proceeding easterly from Husky Dog Creek to the Canol Road the sediments appear to be younger and principally of carboniferous age. The rocks consist of conglomerate, slate, shale, hornfels and greywacke with several small horizons of limestone. This strata is only little disturbed and is very fresh in general appearance. This is particularly true of the conglomerate member that is well-exposed in the cirque valleys near the Canol Road. The conglomerate oxidizes very readily, due to the ferruginous cementation agent, producing a rusty red horizon.

#### Cretaceous (?) Granite

The only intrusive rock type encountered throughout the map area was a fresh grey biotite granite. This intrusive was younger than any of the sedimentary rocks observed and has been classified as cretaceous or later. The granite appears to have undergone practically no fracturing or alteration since

its introduction and seemed to have no later phases such as porphyries and pegmatites associated with it.

#### Economic Geology

In the area traversed no ore deposits of obvious economic significance were encountered.

The Yukon Series contained numerous quartz stringers that, for the most part, were barren of visible mineralization. A grab sample of quartz bearing heavy chalcocite was taken from a canyon along the Hess River near the mouth of Springbuck Creek and gave the following results: Au-Tr, Ag-Tr, Cu-3.5%. Here the individual veins were irregular and varied from a few inches up to a foot in width. They were conforming to the shistosity which gave them an east-west strike and an average dip close to vertical. The copper mineralization was not present in all veins, but occurred in localized zones in three veins observed. It is interesting to note that the channel from the Hess River up Springbuck Creek was called "the White Way" by the Fort Norman Indians; this may indicate the presence of considerable quartz up this channel as the name is said to come from the presence of white rocks there.

The quartzites of this series that are best exposed in the Russell Range and along Russell Creek showed no evidence of mineralization, although in places they had a great many quartz-filled fractures. All the members of the Yukon Series within the map area I believe to be younger than the productive series in the Keno mining camp.

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The remainder of the mineralization encountered appears to be closely related to the granite stocks that form the core of many of the mountains examined. This mineralization for the most part was small quartz veins mineralized with pyrite and chalcopyrite. Two pieces of quartz floats found in a cirque valley on the north-west side of Sunset Mtn. ran 0.28 and 0.6 oz. in gold. These pieces of quartz were well mineralized with pyrite and chalcopyrite, although no visible gold was in evidence. A specimen of highly altered sedimentary rock from near the contact of this stock that bore pyrite and pyrrhotite gave .08 oz. in Au. Samples taken from mineralization of the same nature around the remainder of the granite stocks gave only traces of gold values.

The only indication of basic rock types found in the map area was encountered on the west slope of Barr Mountain. Here a considerable amount of basic float containing pyrrhotite and chalcopyrite was traced up the mountainside only to disappear under a hill of granite talus. On assaying a grab sample of this material a value of 1.1% Cu. was returned.

An outstanding feature of the area running from approximately Mi. 270 on the Canol Road north west toward the headwaters of the Rogue River, is the presence of rust-stained paleozoic sediments. These rocks for the most part are slates that are altered to hornfels near the intrusives. It appears that this rock has been so influenced by the presence of the granites exposed as stocks and those that are a short distance

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beneath the surface that the iron that was an inherent part of this horizon has been chemically re-organized and has left it susceptible to oxidation. The rock itself although very red on the surface was found to contain no primary iron mineral except a few flecks of pyrite.

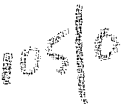
The panning of sands and gravels in creeks and rivers did not bring to light any information concerning the presence of placer deposits. The only indications observed of such workings in the past were several test pits that had been sunk some years ago along the upper part of Barr Creek on the periphery of the Russell Range.

#### Recommendations

As the mineralization throughout the area traversed does not appear to be of economic worth, I do not believe further work along the line of detailed prospecting would be advisable at this time. The area around Sunset Mtn. did disclose some interesting gold values from float material, but as there appeared to be no large structural feature in the immediate area that would make for a large gold ore body I believe time could be spent to greater advantage elsewhere.

For future reconnaissance work the intrusives between Keele Peak and the headwaters of the Rogue River might turn up some interesting information. Mr. Ted Skonseng, foreman of the United Keno logging operation on the Stewart River, and one-time trapper, told me that there are silver-lead occurrences on the south fork of the Rogue River, so his story might stand checking.

The area around Mt. Osgoode and Mt. Selous, between the North and South Macmillan Rivers, contains intrusive rocks. They



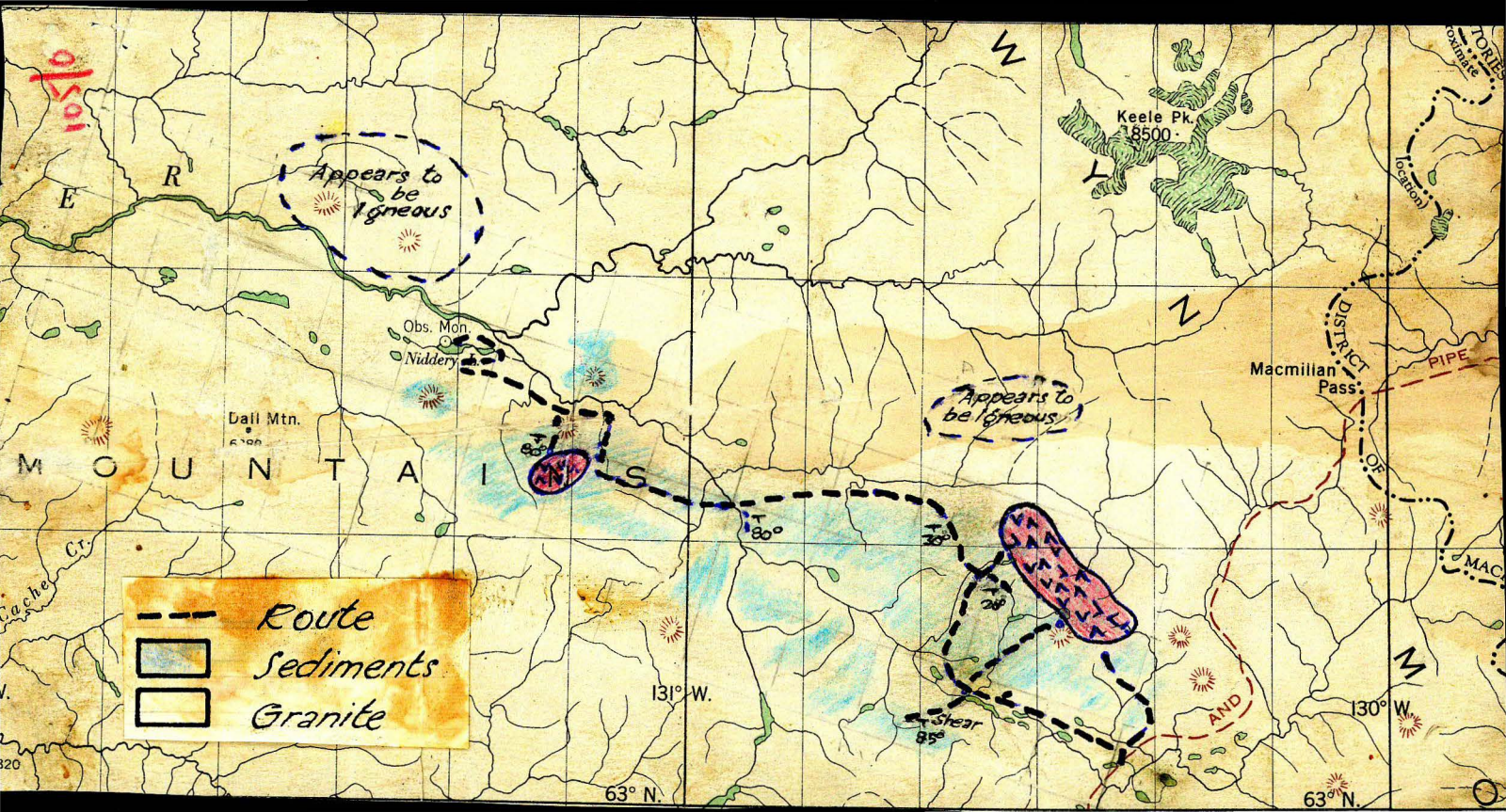
appeared from a distance to be granites similar to the type observed in the map area. In the future, this observation might be verified by closer study of this area.

Of the rocks present the laminated limestones horizons of the paleozoic group have the greatest possibility of containing lead and zinc mineralization. My reason for saying this is purely theoretical. I believe that because of the fetid nature of this rock type, hydrogen sulphide is given off readily when the rock is heated, thus producing ideal conditions for the deposition of stable lead-zinc compounds. This type of rock was host to the lead mineralization on the Hudson's Bay Exploration and Development property south of Mi.274 on the Canol Road. The details of the examination of this property are contained in a previous report.

The efficiency of the summer's work was decreased greatly by the presence of ten pack horses. Although they were most essential for travelling, fewer horses and more plane trips would in the future be advisable. Generally speaking, two horses per man per month are required by a prospecting party in the Yukon. I believe a rubber raft would provide excellent transportation down some of the major rivers such as the north and south branches of the Macmillan River. If such a method could be employed, it would be less expensive and more efficient than horses for reconnaissance work of the area adjacent to the rivers.

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6 c.c.  
October 14, 1952.  
Toronto, Ontario.

F. A. CAMPBELL, P. Eng.



COPY  
4 c.c.

10510  
August 2, 1952,  
Niddey Lake,  
Yukon.

Prospectors Airways,  
Suite 1616,  
44 King Street W.,  
Toronto 1, Ont.

Dear Sirs:

On July 21, after some difficulty making connections with the fourth member of our party (J. Dewhurst), we left Jeff Lake and proceeded Northwesterly on a reconnaissance of a portion of the Hess Mountains. As we were to make connections with an aircraft at our present position by Aug. 3, this leg of the journey was rather rushed and did not allow much time for lateral exploration. With this time factor in mind, I have attempted to cover the topographic features that, from mountain top observations, appeared outstanding.

Enclosed you will find a sketch of our route to date, as well as some of the geologic features observed.

The sedimentary rocks appear to be the same as those encountered along the Canal Road near Jeff Lake and classified as Paleozoic (Carboniferous?) by Kindle. In general, they strike East-West and dip south at dips varying from horizontal to vertical. The undisturbed beds in most cases are some distance removed from the later intrusives, while the highly folded and contorted beds appear in the vicinity of the intrusive stocks. A considerable amount of iron oxide is evident in the sediments near the intrusive contacts.

This oxide appears to arise from iron that was inherent in the sediments. At the time of their formation, particularly one conglomerate member observed, the iron hydroxide may have been the principal cementation agent. The only minerals observed in the sedimentary rocks were pyrite and marcasite. Although they are doubtless responsible for some of the oxide, they were not present in large enough quantities to account for the amount observed.

The only structure observed within the sediments that was not directly associated with an intrusive, was a shear zone s.w. of the more easterly granite stock. This zone had an east-west strike and dips south at 30°, which is steeper than the sediments at that point. The shear could be observed for about 1/2 of a mile, some oxidation had taken place, giving it a yellow and red appearance. The only mineral found in place to give rise to this was nodule-like pieces of marcasite.

The granitic stocks investigated to date are very outstanding mountains, bearing small alpine glaciers. They consist of typical biotite granite that has been dated as Cretaceous and/or later by Kindle. Some of these peaks that have been employed by myself as observation stations attain elevations of around 7,000' and afford a great opportunity for anyone inclined toward alpine gymnastics. The more easterly stock showed some malachite stain with some very fine chalcopyrite in evidence in a north east cirque valley, outside of this Tourmaline and large quartz crystals were the only mineralization observed. The more westerly stock appears to date to be the more

interesting. Associated with it are several porphyry dikes that appear to cut the sediments surrounding the stock. Although more work is necessary to determine their relationship to the intrusive (if any), and to determine if they have any economic significance, they do indicate some activity in the sediments near this stock. A considerable amount of pyrite was in evidence near the contact of the granite and several chalcopyrite, pyrite, galena-bearing pieces of quartz were found directly below the glacier in one cirque valley. None of the mineralization is obviously of economic worth but an assay may cast more light upon this aspect. Furthermore, the areas have just been briefly visited and appear to be worthy of more detailed prospecting.

My future plans, after the arrival of the aircraft, are to investigate the mountains north of Niddery Lake, then proceed to the Dall Mtn. Area, along the headwaters of Cache, Husky Dog, and Barr, Creeks to the Russell Range, thence over to Mayo. The date we will arrive in Mayo and the amount of country we can cover are dependent upon the season and how long our food lasts. As each crossing of the Hess River would necessitate a considerable loss of time in raft construction etc., I only anticipate crossing it to get to the mountains directly north of Niddery.

The following is an estimate of the expenses to be met on our arrival in the fall. I am assuming that we are out until Sept. 15.

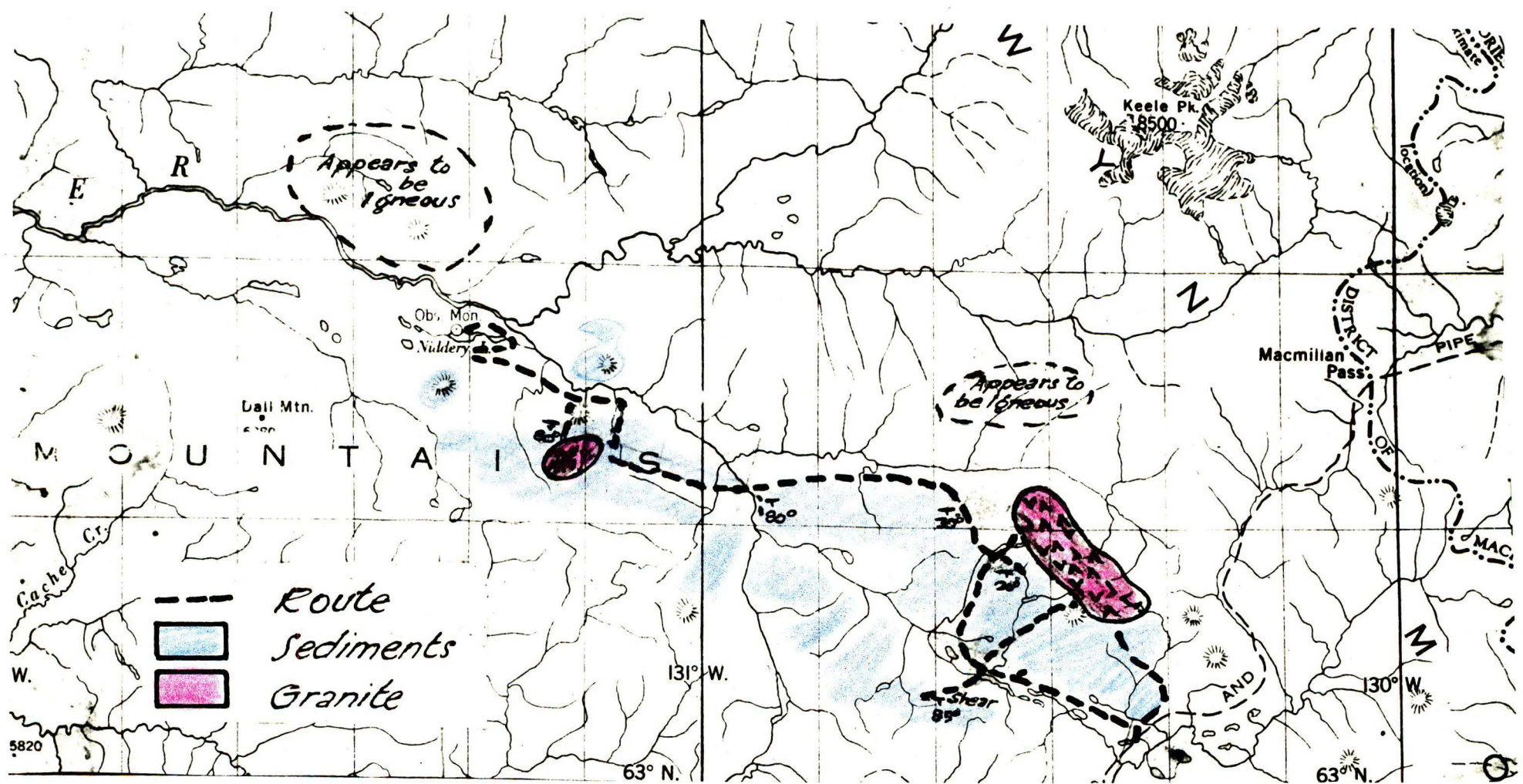
Horses	-	for 64 days @ \$20.00	-	\$1,280.00
2 Packers	-	for 74 days @ \$20.00	-	1,480.00
J. Dewhurst	-	69 days @ \$10.00	-	630.00
Horse Trucking	-		-	<u>400.00</u>
<b>Total</b>				<b><u><u>\$3,790.00</u></u></b>

This is very approximate but may be of some assistance to the accounting department.

The weather to date has definitely left something to be desired, since the 25th of June there are only 3 days that we have not been rained on while travelling. Our food at present is rather low, but we have been doing very nicely on trout, greyling, caribou and sheep, so no one is losing weight.

I would appreciate it, if you would have word for me in Whitehorse in the fall, concerning my next move, and also about the remuneration for the use of my car by Ted Ghisholm in the Klavane Lake Area.

Yours very truly,  
(signed:) F. A. CAMPBELL (P. Eng.)



Copy to: Mr. Coleman, North Hatley  
(1 copy for your file is in office.JK)

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July 14, 1952  
Jeff Lake,  
Mile 258 from Johnsons Cr.  
Yukon Territories.

Prospectors Airways Co. Ltd.,  
Suite 1616,  
44 King St. W.,  
Toronto 1, Ont.

Dear Sirs,

Kindly excuse the use of a pencil in this epistle, but my only pen fell pray to an over-spirited trotting horse somewhere along the Canal Road.

Our present geographical position was arrived at on July 9, 1952. The trip from Johnsons crossing, which is at the junction of the Alaska Highway and the Canal Road, to the Pelly River consumed two and one half days' travelling time under present road conditions. This distance is approximately 140 miles and although we were transported in a 5-ton Tandem International truck, the horses had to be walked the last 18 miles to the Pelly due to bridge washouts and eroded road bed.

The Pelly River was crossed by the simple but arduous method of swimming the horses across the 200 yard expanse of water and manually transporting all the equipment over a very substantial suspended foot bridge.

From the Pelly to our present position is a distance of 120 miles. This leg of the journey was covered on foot and horse-back in 9 days in all. Two of these days were lost to travel due firstly to my being recalled to Ross R. by Mr. E. O. Chisholm to discuss a change in plans and secondly to the loss of horses for one day. The only major obstacle in this section of the road is the crossing of the south branch of the Macmillan River. At the point where the Canal Road crosses, this river is very rapidous due to a steep grade and a preponderance of large glacial boulders. As the bridge no longer existed some other means of crossing had to be found. The classical Yukon method, I am told, is to build a raft, and by using this vessel, transport all the equipment across, then swim the horses. The only difficulty in this method was that there were no trees in sight along the river valley that were over three or four inches in diameter. For this reason it was decided to proceed upstream to possibly locate a more suitable crossing point or larger timber with which to construct a raft. As we travelled along the bank of the Macmillan, E. D. Kindle's explanation of the stunted growth in this valley was brought pointedly home to me. The valley was filled with grey boulder clay that was in a semi-plastic condition and commenced gravity creep on the slightest provocation. Several horses became mired and one rolled down a fifteen foot embankment. After travelling in the rain over four miles of this terrain, the horses were exhausted, and as it was one A.M. we decided to camp and wait for better light. The following day we took the entire train across under full pack getting only our feet wet. That morning we arrived at Jeff Lake, where I found a message from Mr. E. O. Chisholm telling me not to go any farther until one J. Dewhurst, newly employed by him, arrived to accompany me through the Hess Mountains. To date he has not arrived, although the Hudson's Bay

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aircraft has been in once since that time, the only word I received is by word of mouth from the pilot who stated he should be in on the 15th, weather permitting, and for me not to budge till he arrived.

I have investigated the first part of our route for a distance of about 7 mi. north of our present camp. The travel will be very difficult by pack train due to swampy ground and numerous east west trending glacial valleys that are filled with loosely packed moss-covered glacial boulders that provide very poor footing for horses. Also I anticipate accurate mapping, even of a reconnaissance nature, between here and just west of Midway Lake will be greatly hampered due to the lack of photographs of this area.

This season mineral exploration in the area already traversed is being undertaken by the Hudsons Bay Exploration & Development Co. and Comvest Exploration. The latter have a prospecting party of two men who will be working in the Sheldon Lake area till August 15.

The current activities of the Hudsons Bay Co. are more extensive. I will enclose a rough sketch map covering the areas I believe, from information gleaned along the road, that they are covering this season.

The location and activity of their parties are as follows:

(1) Diamond drilling operation 1.5 miles east of Mileage 274 from J. Crossing. I visited the property on July 10, 1952 and found a well established camp consisting of bunkhouses and cookery constructed from Canal Road buildings. The property is serviced by aircraft to Jeff Lake and from there by jeep down the Canal and 1.5 miles in on a bulldozed road constructed for the drilling operation. At that time there were two drills on the property, both working around the clock. As the geologist in charge of the camp (Ken Gandy) was in Whitehorse at the time of my visit I had some difficulty securing any specific data on the mineral occurrence, outside of what could be ascertained from an examination of the surface with no knowledge of assay results.

The visible mineralization is very fine galena that has formed as a replacement deposit along selective planes in a banded limestone. The limestone horizon is between 15' to 20' wide, strikes N30°W and dips at about 85° in a south westerly direction. The country rock enclosing the limestone is a carboniferous slate that appears to have the same strike and dip, although this rock type gives rise to a heavily talussed slope that makes a detailed examination of the bedrock difficult. In the three trenches across the limestone that were examined the mineralization was not impressive. No sphalerite was visible although zinc values are said to exist. The mineralization is not consistent and in places the laminated limestone appears, to the eye with the aid of a hand lense, to be barren. A piece of float encountered by myself on the talus slope did bear much heavier mineralization than seen in the trenches so it is possible that pods of concentrated mineralization may exist.

(From Finley Campbell)

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The favourable limestone horizon appeared to be 600' long but did not persist into the surrounding hills. A specimen of the best mineralization found is being forwarded to your office. See also the enclosed sketch.

(2) Party of 2 prospectors in the vicinity of Keele Mountain. They have left this area for the present and gone out to the Burwash Landing area.

(3) Party of 2 prospectors covering area from around 270 mi. on Canal through Ross Mountains to Midway Lake.

(4) Party of 2 prospectors going north of Canal Road from Mi. 241, possibly to investigate limonite occurrence reported by E. D. Kindle and to explore area around the small granite stock shown on Kindle's Map.

We have been experiencing a very rainy season to date which has greatly hampered the field activities of everyone in this area.

I would appreciate it if you would have a copy of this report typed and returned to me for future reference.

Yours very truly,

(Signed) "F. A. Campbell" P.Eng.

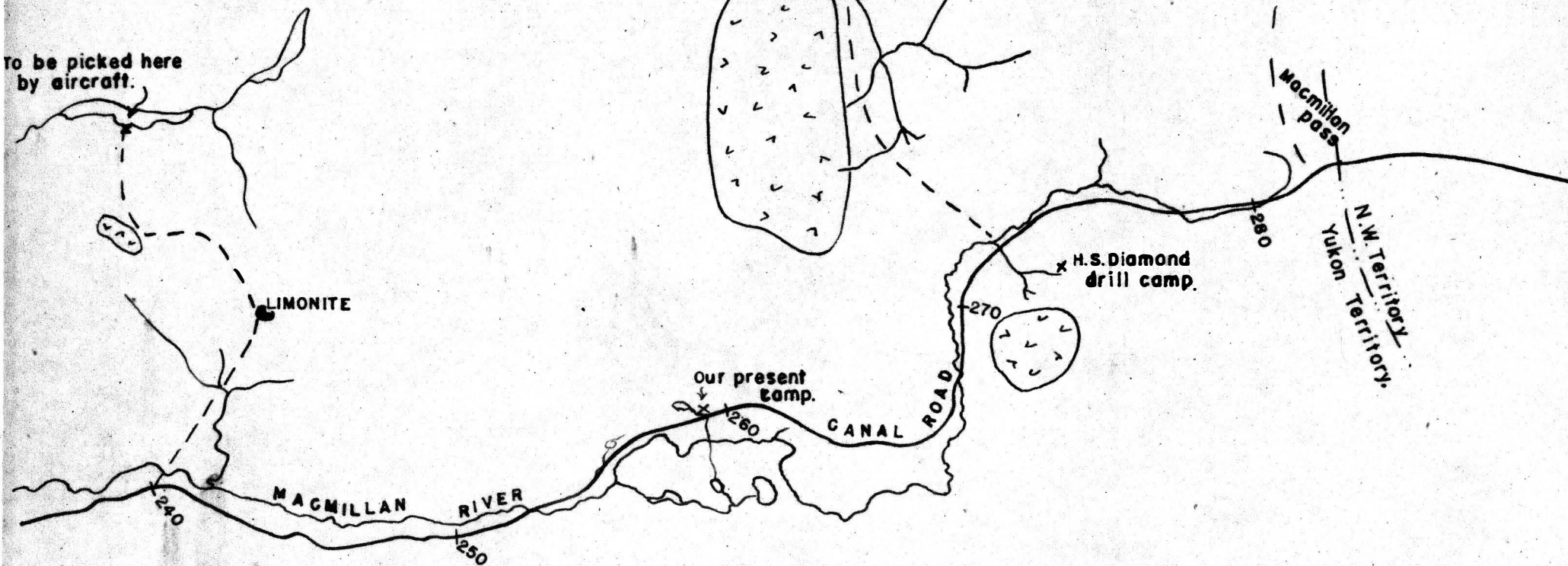
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To be picked here by aircraft.

To Niddery Lake

To around Keele Mtn.



----- Presumed route

Sketch showing areas to be covered by H.B. Co. Prospectors. Copied from E.D. Kindle's Map.

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Scale 1" = 4 Miles.

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N.



85°

Banded Ls. bearing Pbs  
App. elevation 4900'

slate

App. site of D.D.H.  
at 35°

slate

Cirque-like  
valley head.

Talus  
slope

slate

Drift.

Drift.

slate talus slope

Elevation app.  
4500' •

Sketch of H.B.Co. showing  
1.5<sup>mi</sup> East of Mi. 274 Canal Road

Scale 1" = 200'

July 14/52

F.A.C.

