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010450

May 16, 1961.

Dr. Glenn E. Rouse,
Dept. of Biology and Botany,
University of British Columbia,
Vancouver 8, B. C.

Dear Glenn:

Many thanks for sending me a copy of your letter to Mr. Rennie dated May 12th, together with the reprint of your joint paper with Dr. Mathews. For our part, we are grateful to you for making this examination of coal and shale, and for its interesting results.

Since my letter to you on April 24th, we have received from the Geological Survey of Canada a result of age-dating the biotite of a sample of argillized andesite lava of the Kingsvale Group from about 4,230 feet elevation in the open pit at Craigmont mine. This rock, which was collected by me from about 50 feet above the unconformity overlying the Nicola group, is dated as 80 m.y. This upper Cretaceous age for a rock located about 1 mile westward of and nearly 2,000 feet higher in elevation than your coal sample of apparent mid-Eocene age suggests the possibility of geological complexities not hitherto recognized in the Craigmont area. It seems desirable that in the near future we try to sample any biotite-bearing rocks which may exist (i) at the underground locality of the coal seams at Craigmont (ii) at or above the plant-bearing beds at the Kingsvale type-locality. You would appear from your writings to be as interested in this kind of correlation as we are, and you may therefore prefer to follow this up yourself. If not, I shall look for suitable biotite-bearing samples when in the Merritt area next month. The Geological Survey of Canada have expressed interest in the possibility of obtaining palaeontological correlation with the dated Kingsvale lava, and we expect to inform them of the results of your examination of the Craigmont coaly material. Before

we do so, you may wish to add to your comments, for example, on the extent to which the micropalaeontology of the Kingsvale group is known. We should be grateful for any such comment that you are able to provide.

With regards,

Yours truly,

J. M. Carr,
Geologist.

JMC/tr
c.c. Mr. C.C. Rennie,
Senior Geologist,
Craigmont Mines Limited, Merritt.

THE UNIVERSITY OF BRITISH COLUMBIA

VANCOUVER 8, CANADA

Age Det^n file

DEPARTMENT OF BIOLOGY AND BOTANY

May 12, 1961.

Mr. C.C.Rennie,
Senior Geologist,
Craigmont Mines Ltd.,
Box 399, Merritt, B.C.

Dear Mr. Rennie:

The analysis of your coal and carbonaceous shale has revealed the following plant microfossils:

Alterosaeptites rudforthii Rouse ,	Burrard fm.	Mid-Eocene.
fungal spores W_{26}. W_{27}. W_{29}.	"	"	.
cf. Quercus granopollenites Rouse,	"	"	.
Hills 4-58 tricolpate.	Princeton beds.	"	.
Hills one-porate grains(Juniperus?)	"	"	.

The microflora is relatively meagre, but the forms that are present occur only in Eocene (or early Tertiary) beds as far as I am aware. On checking slides from the plant-bearing beds from the type locality of the Kingsvale volcanics, I could find no identical or even similar species. From this, I can only conclude that your coal and shale specimens are Tertiary in age, and very probably Middle-Eocene.

I am enclosing a reprint of a recent paper by myself and Dr. Mathews on several recent datings of the Tertiary. Since this publication, we have obtained several other dates for plant-bearing beds in the Interior which fall in the same time range, viz. Mid-Eocene. From this it appears as though the scattered Tertiary basins are essentially contemporaneous, and the Coldwater beds very probably form another locality of the same age.

If there are any questions on this problem, please don't hesitate to write.

Yours very truly,

Glenn E. Rouse
Assistant Professor.

c.c. J.M. Carr,
Geologist,
Dept. Mines and Petroleum Res.
Victoria.

COPY.

DEPARTMENT OF GEOLOGY. Geochemistry

University of Alberta

AK No. 194 (Other No.) K-mineral Orthoclase

Source Material: Mineralized rock Collector: C.C. Rennie Date: Jan. 1961

3500' level, Craigmont Mine, Merritt, B.C. Mineralization is in Upper Triassic Nicola sediments adjacent to south end of Guichon batholith (186 m.y. old at Bethlehem Copper property - biotite).

Location: 3500' level, Craigmont copper property, Merritt, B.C.

Separation Procedures:

Magnetic - None (sample as submitted was very high in magnetite content)

Heavy liquid - Less than 2.6 (bromoform-aceton, centrifuged)

Other - Crushed and screened, 35-100 mesh fraction used for dating

Notes: In a biotite-orthoclase pair we obtained an age of 82 m.y. for the biotite and 64 m.y. for orthoclase feldspar in a veinlet cutting the granodiorite (Kain Quarry, Montana). This would be a pair closely analogous to Guichon biotite-Craigmont orthoclase.

Orthoclase, considerable staining from iron oxide gives it a pink to reddish appearance. A little fine sulphide and magnetite as inclusions in the orthoclase.

No twinning.

Analytical Results:

Run No.(s)	208	A^{40}/gm. sample	5.67_3	x 10^{-5}	cc. STP
% K_2O	15.46	A^{40}/K^{40} =	0.00653		
%K		Calculated Age(s)	108 x 10^6 yrs		
Comments:		(140 x 10^6 yrs with 35% A^{40} leakage from feldspar)			

See Folinsbee's quoted comments in letter from Rennie 21st April 1961.

DEPARTMENT OF MINES AND TECHNICAL SURVEYS

CANADA

GEOLOGICAL SURVEY OF CANADA

GSC 61- (921), Biotite, K-AR age 80 m.y.

Published GSC paper 62-17 (1963).

K 6.97%, Ar^{40}/K^{40} .00479. Radiogenic argon 93%. Concentrate; clean light to dark red-brown biotite with a small amount of greenish brown flakes. Some flakes are zoned and many of the flakes contain small inclusions of quartz. Chlorite not detected.

From argillized vitrophyric biotite-andesite lava. Between forks of Birkett Creek at almost 4,230 feet elevation, British Columbia, 50°12'N, 120°55'W. Map unit 6, GSC Map 886A, Sample JMC 60-110. Collected and interpreted by J. M. Carr, B.C. Dept. of Mines and Petroleum Resources.

Interpretation;- The sample is from unmineralized volcanic strata which unconformably overlie mineralized Nicola rocks forming a low-grade halo around the Craigmont orebody. Orthoclase from veins in the orebody has been dated as not less than 108 m.y. (recent unpublished determination by the Department of Geology, University of Alberta).

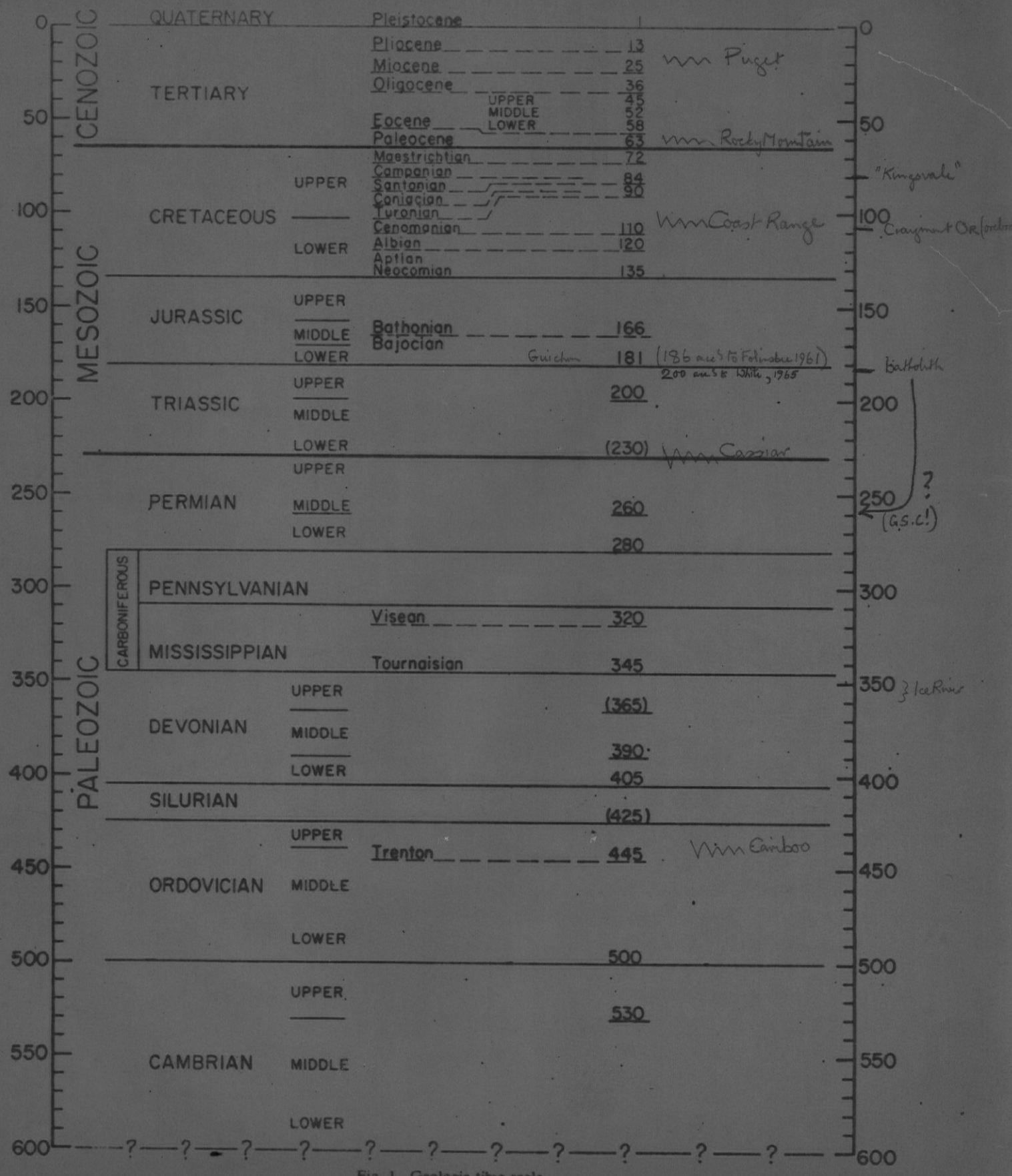


Fig. 1. Geologic time scale.

Helen, copy of letter & attached, please. H. Carr.

attached is record of age - dated Craigmont Ck.

CRAIGMONT MINES LIMITED

(NON-PERSONAL LIABILITY)

MINE OFFICE MERRITT, B. C. CANADA

21st April, 1961.

Dr. J.M. Carr,
B.C. Department of Mines,
Parliament Buildings,
VICTORIA, B.C.

Dear Mike,

Thank you for your letter of April 18th. We have collected specimens of the coal and coaly material and would be pleased if you contacted Dr. Rouse regarding age dating the coal. I have been checking over Cockfield's Memoir 249, and note on Page 30 that he states that G.M. Dawson placed these volcanic rocks on Promontory Hill in the Kamloops group. Seems possible that the coaly sediments could represent the Tranquille beds of Tertiary age, and the Coldwater coal measures could be beneath the 2400' level. If contact with the Nicola rocks is steep, the 2400' level could continue in this sequence to 4000' from the portal. We have already passed through this thin band of coaly sediments which have a true thickness of approximately 30' and have driven another 200' in agglomerate. Time will tell whether we will encounter Coldwater beds or not.

Previous letter from Cliff Rennie (Apr 13th) said the coaly seams were not 2000' from portal, & dipping 30° E?

Attached is a copy of Folinsbee's age determination on the orthoclase. The following is an excerpt from his letter:-

"The date, 108 m.y., is based on very good analytical data - the feldspar is extremely rich in potassium and there was an abundance of argon-40 for the mass spectrometric run. Potassium feldspar may leak a certain amount of its argon-40 and the actual age of mineralisation might be about 140 m.y.; it is certainly not younger than mid-Cretaceous, 100 m.y. The vein material then may represent a late phase of activity related to the Guichon intrusive (186 m.y.); more likely it represents mineralisation related to mid-Cretaceous orogeny."

N.B. G.S.A. Bull April 1961 p. 651 gives 186 m.y. as an U. Triassic age.

We will be very pleased to receive the age date on the volcanics, and in return will keep you informed of new geology.

Yours truly,

C.C. Rennie.
Senior Geologist.

Enc.

CCR:hh

WHEN REPLYING PLEASE REFER TO

FILE No. 92ISE35

THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF MINES AND PETROLEUM RESOURCES
VICTORIA

May 3, 1961.

Mr. C.C. Rennie,
Senior Geologist,
Craigmont Mines Limited,
Merritt, B.C.

Retyped sent.

Dear Cliff:

Thank you for your letter of April 28th, with its information. We have heard from the Geological Survey of Canada that they expect to have an age-date available shortly for the Kingsvale sample from the open pit.

Dr. W.R. Danner has made a preliminary study for this Department of Nicola fossils collected mainly by him, and we enclose a copy of his report herewith. He identifies the pelecypod, Halobia, at Lookout Point and various corals in the north branch of the limestone belt No. 3, south of the Hank No. 30 showing, and suggests the Halobia horizon, of Karnian age, is older than this coral horizon, which he thinks is Norian. Dr. Danner informs us that, in his opinion, it might be possible to divide the Nicola by fossil study, but poor preservation and present lack of knowledge of U. Triassic faunas will make the task difficult. I am sure that Danner would be pleased to receive additional fossils from the Nicola rocks of this area, accompanied by an identification of their locality on, I suggest, a partial tracing of our 1000 scale geological map, a copy of which I am sending to him. He is attempting to build up a collection of these fossils at the University and is retaining the fossils previously collected as the nucleus of such a collection.

I expect to be at Merritt from June 2nd for two or three weeks and look forward to seeing new developments and filling-in gaps in my existing work.

Yours very truly,

J.M. Carr,
Geologist.

JMC:ln
Enc: Report

cc: Dr. W.R. Danner, Dept. of Geology, U.B.C. Vancouver 8, B.C.

OPEN PIT

WASTE DUMPS

WATER TANK

PRIMARY CRUSHER

PIT SHOP

3500 LEVEL PORTAL

3000 LEVEL PORTAL

CABLE BELT CONVEYOR

WATER TANK

SECONDARY & TERTIARY CRUSHER

STACKER

STOCKPILE

FINE ORE BINS

GRINDING

FLOTATION

CONC. STORAGE

ASSAY & RESEARCH

WAREHOUSE

DRY

OFFICE

WATER TANK

SUBSTATION

POWER HOUSE

SHOP

2400 PORTAL

12" FRESH WATER LINE FROM NICOLA R.

12" RECLAIM WATER LINE

66000 VOLT POWER LINE

4TH STAGE PUMP

RECLAIM WATER PUMP

TAILINGS POND

RECLAIM WATER DITCH

TAILINGS TOE DAM

TAILING THICKENER

TELEPHONE & TELETYPE

NATURAL GAS LINE

PARKING LOT

inches
0 1 2
0 1 2 3 4 5
centimetres

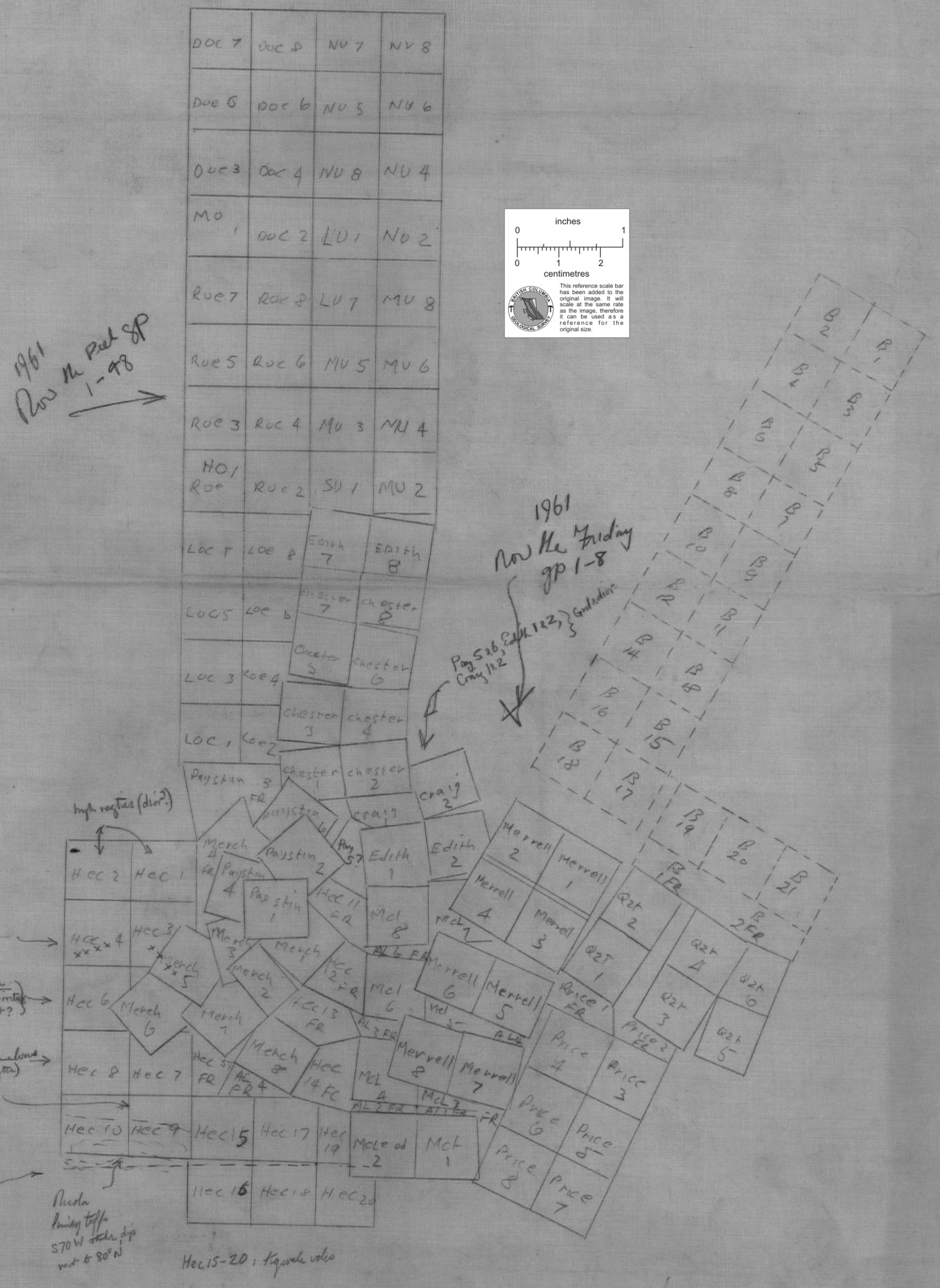
BRITISH COLUMBIA GEOLOGICAL SURVEY

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

CRAIGMONT MINES LTD (NPL)

MINE & CONCENTRATOR

MERRITT, B.C.



Mineral claim map

Crayfmont Mines Ltd.

Scale: 1" = 25·00'

inches
0 1 2
0 1 2 3 4 5
centimetres

BRITISH COLUMBIA GEOLOGICAL SURVEY

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

Noranda

Noranda

Noranda

Creek

Noranda

Craigmont

Rio Canadian Exploration

Forestry Lookout

I.R.9

Canadian Exploration

Centennial

Centennial

Noranda

Centennial

Guichon

I.R.1

N

Lower Nicola

Canford

Nicola

0 1 2 3
MILES

Nicola River

PRINCIPAL CRAIGMONT ROCK GROUPS RECOGNIZED BY DEPARTMENT OF MINES, JANUARY, 1959.

1. **Field Name Used in 1958:** pale siliceous tuffs.

   Field Appearance: tough fine to fine-medium grained light grey and grey-green rocks; moderately well laminated; somewhat banded; tendency to fracture conchoidally like quartzite; most has easily-visible irregular quartz grains seldom exceeding ½ mm. in length; quartz-epidote veinlets; pyrite disseminated; garnet seams occasional; little or no free calcite.

   Proposed Name: greywacke

   Remarks: rocks probably equivalent to these occur in outcrops at Look-Out Point, Promontory Hills.

   Drill-core specimens: Hole #19 at 314 ft. & 430 ft. (JMC58-265^S)
   Hole #21 at 450 ft. (JMC58-270 ; RL.H21-450)

2. **Field Name Used in 1958:** dark siliceous tuffs.

   Field Appearance: rather tough fine-grained dark grey or dark green rocks; laminated and partly foliated, with pink, light green and light grey foliae in a dark matrix; may contain dense, fine-grained, pink, angular fragments up to 2 inches; contain little free calcite though may be interbedded with heavily skarnified or mineralized sections.

   Proposed Name: quartzofelspathic tuffs.

   Remarks: some of the rocks are lithic tuffs or volcanic greywackes with vitrophyric andesite fragments. Others may be hornfelsed greywacke. The pink fragments and lenses consist almost wholly of alkali-felspars in granular mosaic. Some of the rocks carry fine-grained epidote and actinolite and are skarny.

   possibly equivalent rocks occur in outcrop at Promontory Hills, some being pebbly or agglomeratic.

   Drill-core specimens: Hole #7 at 20 ft. and 656 ft. (JMC58-277^S)
   (JMC58-272^S)
   (RL.H7-20')

3. **Field Names used in 1958:** dark limey tuffs, greenstone, andesite

Field Appearance: dark green or dark grey-green fine to fine-medium grained rocks; actinolitic and/or chloritic; mostly without conspicuous lamination; may contain grey or pink, fine-grained, sub-angular volcanic fragments up to 2 inches; may have a blotchy texture due to uneven distribution of the principal mineral components; free calcite generally present as streaks and patches; red-brown garnet if present may be either heavily disseminated, in isolated crystals or aggregates, or in seams and layers; heavily mineralized sections occur preferentially with rocks of this group.

Proposed Names: limey tuffs, skarnified tuffs, skarn.

Remarks: in thin-section, potash-felspar is a common component of many rocks and also occurs as a principal component in the pink fine-grained fragments, which are similar to those in the quartzofelspathic tuffs. Tourmaline was noted in one rock. An unusual type in this rock-group is skarnified agglomeratic limestone (JMC58-278^S (at end of hole #7). At Look-Out Point, the outcrop includes nearly pure limestones, pebbly limestones and limey tuffs. The apparent sequence of these rocks includes some quartzo-felspathic rocks.

Drill-core specimens: Hole #7 at 489 ft, 625 ft. and 750 ft. (JMC58-274^S) (JMC58-276^S & RL.M7-630') (JMC58-278^S; RL7-750')
Hole #15 at 1125 ft. (glomero-texture garnet-skarn. JMC58-326^S; RL15-1125')
Hole #21 at 748 feet and 778 ft. (JMC58-281) (JMC58-282^S; RL.21-778')

4. **Field Name Used in 1958:** micro-quartz-diorite. (or "diorite")

Field Appearance: fine-medium grained, holocrystalline, mesocratic rock of felted texture and with white felspar and chloritized biotite the most conspicuous minerals; magnetite disseminated; the pink felspar content is variable.

Proposed Name: as above. Not named andesite in order to prevent confusion with vitrophysic flow-rocks and tuffs of this composition.

Remarks: is partly quartz-monzonite in composition.

Drill-core specimen: Hole #19 at 145 ft. (JMC58-279^S)

ADDITIONAL COMMENTS ON CRAIGMONT ROCK-TYPES

(a) Diorite was logged in 1958, distinct from micro-quartz-diorite. Some of the so-called diorite may be of metasomatic origin, e.g., veins in Hole #21 at 617 ft. (JMC58-280s ; RL 21-617)

(b) Rock type at 935 feet (JMC58-287s) in Hole #15 was logged as ~~tuff~~ "m/porph andesite" but in thin-section is classified as porphyritic micro-quartz-diorite; may be meta-tuff. Is andesite, judging by re-exam of core 16 June

(c) In general, distinct pyroclastic textures are wanting and most of the stratified rocks were probably water-deposited. The name "tuff" is retained for convenience. A more correct terminology would be difficult to obtain and even more difficult to use in the field.

(d) Some specimens have a texture resembling mylonitic texture, e.g., in Hole #7 at 656 feet.

(e) The prevalence of potash-felspar (probably orthoclase) is of interest. It was not seen in specimens collected from Look-Out Point.

(f) Mineralized sections were classified according to (i) presence or absence of unreplaced fragments, (ii) whether these fragments are limey or quartzo-felspathic, (iii) relative proportion of specularite and magnetite (or ~~the~~ magnetic ~~pseudomorph after~~ specularite), (iv) abundance of pink felspar in the ore-section.

Department of Mines,
Victoria, B.C.,
January 21st, 1959.