

ULTRA Property

M 562

and

REPORT ON

CUB (TELLURIDE) CREEK PROPERTY

KLUANE DISTRICT, Y.T.

for

AQUITAINE CO. OF CANADA LTD.

J.G. Abbott and R.J. Cathro

September 30, 1977

0123-96560
TN27. Y8
C4
C8

TABLE OF CONTENTS

	<u>Page</u>
Summary and Recommendations -----	1
Introduction -----	3
Location and Access -----	3
Claim Data -----	4
History and Previous Work -----	5
Geology -----	7
Geomorphology -----	7
Surficial Geology -----	7
Stratigraphy and Structure -----	9
Mineralization -----	16
Exploration Potential -----	21

TABLE OF FIGURES

Figure No.

- 1 Geology 1:12,500 ----- in pocket
- 2 Photo showing view southward across Telluride Creek
 and up Cub Creek.
- 3 Typical Ruby till along Telluride Creek.
- 4 View southward along Cub Creek towards Cairnes Glacier.
- 5 The major massive sulphide boulder in Cub Creek.
- 6 View looking northwest across Cairnes Glacier.

SUMMARY AND RECOMMENDATIONS

The Cub Creek (Telluride Creek) property is an old float occurrence of Kuroko-type massive sulphides that was intensively explored on many occasions before it was restaked by Archer, Cathro and Associates Ltd. as the Tell claim group in September, 1976. During August, 1977, Aquitaine Co. of Canada Ltd. financed a short program of remapping and additional prospecting by an Archer, Cathro crew led by Grant Abbott that resulted in the discovery of the probable bedrock source, which is only 30 m long and 1 to 2 m thick. It occurs near the top of an almost inaccessible cliff at an elevation of about 8300 feet, approximately 5000 m from the main cluster of float.

The sulphide float is concentrated in a medial and terminal moraine of St. Elias Advance till near the junction of Cub and Telluride Creek. This till was deposited during an earlier advance of the Cairnes Glacier and is easily distinguishable from valley glacial till and post-glacial lake sediments of the older Ruby Advance. The andesite, which is the host rock for the float in the moraine outcrops at the head of the Cub Creek valley within an assemblage of Cambrian to Carboniferous age that has been named the Alexander Terrane by the GSC. The Alexander Terrane, which also includes phyllites and carbonates, is separated to the north-east by the northwesterly trending Duke River Fault from mainly Mesozoic sedimentary and volcanic rocks of the Taku-Skolai Terrane that underlie the sulphide float occurrence.

Numerous assays by various companies over the years have shown that three distinct types of copper mineralization occur on the property - (a) massive pyrite containing appreciable chalcopyrite and sphalerite and a trace of galena; (b) a disseminated pyrite-pyrrhotite-chalcopyrite assemblage; and, (c) native copper in volcanics. The first type occurs in the float boulders and was found in place in 1977. It is distinguished from the second type by its lead-zinc content and the absence of nickeliferous pyrrhotite. An average assay for the Kuroko-type mineralization is about 5 per cent Zn, 2 per cent Cu, 0.5 per cent Pb, 1.25 oz/ton Ag, 0.005 oz/ton Au and less than 0.01 per cent Ni.

The closest textural and mineralogical resemblance and similar metal ratios and host rocks make it virtually certain that the occurrence found in 1977 is the source of the float that occurs near the junction of Cub and Telluride Creeks. This occurrence lies off the Tell claim block to the southwest on unstaked ground but has no economic potential because of its limited size, difficult topographic setting and proximity to the boundary of Kluane National Park. It is recommended that no assessment credit be filed and that the Tell claims be allowed to lapse on their normal expiry date.

The discovery of the source of this float provides very little regional exploration potential because most of the Alexander Terrane rocks in this region lie within Kluane Park. A possible exception is in northwestern B.C., south of the Park, where mapping is incomplete and rugged topography and extensive glacial cover make exploration unusually difficult.

INTRODUCTION

The Cub Creek (Telluride Creek) property is an old float occurrence of Kuroko-type massive sulphides that was intensively explored on many occasions before it was restaked by Archer, Cathro and Associates Ltd. as the Tell claim group in September, 1976. The showing consists of a few large fragments of Kuroko-type massive sulphides in glacial till. The 1977 field program included an airborne EM survey by Scintrex Ltd. on July 29, mapping and prospecting by a two man crew led by J.G. Abbott between August 19 and 29, and a Max-Min orientation survey by Grant Hendrickson of Aquitaine between August 27 and 29. Financing for the 1977 work was provided by Aquitaine under an option agreement. The geophysical results are not yet available and will be reported on separately by Scintrex and Hendrickson.

LOCATION AND ACCESS

The property is situated on Cub Creek, a short tributary that enters Telluride Creek about ten miles above its junction with Jarvis River. The Jarvis drains in turn into Kaskawulsh River and finally into Alsek River, which flows through the Alaska Panhandle and empties into the Pacific Ocean. The claims are centered at $60^{\circ}54'N$ and $138^{\circ}14'W$, within claim sheet 115B/16, and are situated about 27 air miles ^{south} ~~northwest~~ of the nearest community and helicopter base at Haines Junction (milepost 1016 on the

Alaska Highway). Haines Junction is connected by a 158 mile gravel highway to the seaport of Haines, Alaska. The Alaska Highway passes within six air miles on the north side of the property and a bulldozer trail some ten miles long connects the property to milepost 1050 on the highway. Mt. Cairnes, at the head of Cub Creek, lies on the northeast boundary of Kluane National Park. For the 1977 work, access was by means of a Trans North Turbo Air helicopter based at Haines Junction and a Transwest helicopter based at a GSC camp 10 miles west on Kluane Lake. A location map at a scale of 1:1,000,000 (about 16 miles to one inch) is included in the upper right corner of Figure 1 in the pocket of this report.

CLAIM DATA

The property consists of 62 contiguous claims recorded in the Whitehorse Mining Division as follows:

<u>CLAIM NAME</u>	<u>NUMBER</u>	<u>TAG NUMBER</u>	<u>EXPIRY DATE</u>
Tell 1-6	6	YA8239-YA8244	30 September, 1977
Tell 7-62	<u>56</u>	YA8912-YA8967	31 May, 1978
	<u>62</u>		

The claims are owneded by Archer, Cathro and Associates Ltd.

HISTORY AND PREVIOUS WORK

The original discovery by placer miners of "crushed copper and pyrite zones at the head of Telluride Creek" was first reported in the GSC Annual Report of 1904. As far as is known, the first lode claims were not staked until August, 1955 when the Cub group was recorded by Gaymont Prospecting Syndicate (which included Teck Exploration and Iso Uranium) following the discovery of the large massive sulphide boulders in glacial till near the junction of Cub and Telluride Creeks. These boulders constitute the showing and all subsequent work was directed towards locating their source. The regional geology and details of previous exploration have been derived from the sources mentioned below, including unpublished assessment reports.

Between 1955 and 1977, repeated geochemical and geophysical surveys, prospecting, and drilling were performed in the immediate vicinity of the float discovery, as shown on Figure 1. This included a resistivity survey and three shallow diamond drill holes (108 m) that failed to reach bedrock in 1956 by Gaymont; a Turam-type EM survey in 1961 and two rotary holes (about 122 m) in 1962 by Canex Aerial Exploration; and limited prospecting in 1964 by Meridian Syndicate (Canex, Noranda and Asbestos Corp.). The most extensive work began in 1965 when the property was restaked by Coranex Syndicate (Frobex, McIntyre Porcupine, International Nickel, Dome Mines and Denison). Their program included another Turam survey, a geochemical survey and more prospecting in 1965, 1966 and 1967 followed by additional prospecting, EM and geochemical surveys and three diamond drill holes (216 m) in 1970 by a joint venture between Dynasty Exploration, Atlas Exploration and Canadian Industrial Gas & Oil working under an option from Coranex Syndicate.

The regional geology was mapped locally by J.O. Wheeler of the GSC from 1953 to 1955 (Map 1134A) and has been further defined by other GSC geologists in adjacent mapsheets - E.D. Kindle in map-area 115A between 1946 and 1950 (Map 1019A and Memoir 268), and J.E. Muller in 115F & G between 1946 and 1950 (Map 1177A and Memoir 340). A valuable stratigraphic correlation and more detailed study was conducted by P.B. Read and J.W.G. Monger of the GSC in 1974 to 1977 as part of Operation St. Elias. Their earlier work was released in late 1976 as Open File 381 "Pre-Cenozoic Volcanic Assemblages of the Kluane and Alsek Ranges" while Read kindly made his 1977 mapping available to the Archer, Cathro crew in advance of its formal release. The remainder of the preliminary data collected by Operation St. Elias in 1974, including a study of the Tertiary volcanic rocks by J.G. Souther and C. Stanciu, was released in Paper 75-1A, pp. 51-70.

The surficial geology and glaciation in the St. Elias Mountains has been studied by Muller, in connection with his 1:250,000 scale regional mapping, and by the Icefield Ranges Research Project of the Arctic Institute of North America and the American Geophysical Society in 1964. Those results were published in the American Journal of Science in October, 1966 as follows:

Neological Chronology, Northeastern St. Elias Mountain, Canada by

George H. Denton and Minze Stuiver, pp. 577-599.

Late-Pleistocene Fluctuations of Kaskawulsh Glacier, Southwestern

Yukon Territory, by Harold W. Borns, Jr. and Richard P. Goldthwaite,

pp. 600-619.

GEOLOGY

Geomorphology

Cub Creek drains an alpine cirque glacier, named Cairnes Glacier by Denton and Stuiver, on the northeast flank of the Kluane Range. Local relief exceeds 4600 feet, with peaks at the head of the valley reaching elevations of 9000 feet. The lower half of the glacier is surrounded by thick lateral and terminal moraines but elsewhere outcrop exposure is greater than 90 per cent.

The lower half of Cub Creek enters the Shakwak Valley, which forms a rolling, northeasterly-sloping upland. Overburden is extensive and outcrop is confined mainly to deeper stream cuts. Buckbrush is common below an elevation of about 4300 feet to the north of Cub Creek but is restricted to isolated patches in sheltered areas above this elevation, where vegetation consists mainly of grass, flowers and lichen. There is little soil development and organic cover is light, even in timbered areas.

Surficial Geology

The surficial geology in the vicinity of Cub Creek is shown in simplified form on Figure 1. The glacial history is complex and three distinct types of surficial deposits have been recognized. Regionally extensive boulder till and post-glacial lake sediments are the oldest recognizable deposits and these are probably related to the latest period of regional glaciation, called the Ruby Advance by Muller. Morainal debris

along the lower half of Cub Creek is younger and is apparently related to a stage of valley glaciation called the St. Elias Advance by Muller. The sulphide boulders occur within these St. Elias deposits. Modern, active glaciation is confined to the upper half of Cub Creek.

The older deposits of the Ruby Advance are characterized by the presence of fairly well rounded boulders of foreign granitic rocks, primarily granodiorite and diorite, many of which are weakly pyritic and rusty weathering. All material seen within this till is less than one metre across. Granitic boulders are consistently present up to an elevation of about 5300 feet, which corresponds to an abrupt concave break in slope. Most areas above 5300 feet are steep and are underlain by locally derived talus and felsemeeer. It seems likely that 5300 feet is the maximum elevation reached by this period of glaciation, although it is possible that till was deposited at higher elevations and has since been eroded from the steeper slopes.

The till blanket has been extensively reworked by streams and later glaciers and the original morphology and mode of deposition could not be determined. Along Telluride Creek, thicknesses range from 0 to 10 m but greater thicknesses occur along the plateau farther south. The lower half of Telluride Creek cuts through silt and clay banks up to 100 m or more thick below an elevation of about 3900 feet. They were not examined closely but are presumed to be lake sediments deposited during the waning stages of Ruby glaciation.

Younger, locally-derived till along the margins of the lower half of

Cub Creek are characterized by the presence of angular boulders which vary greatly in size but are locally up to several metres across. Most fragments consist of local rock types that occur in outcrop at the head of Cub Creek. A few foreign granitic fragments are also present but they are presumed to be derived from reworking of the older Ruby till. Large angular boulders were seen only in a small area along the margins of Cub Creek. This till, which has obviously been deposited by a small alpine glacier which emerged from Cub Creek, has a variable thickness but may reach 50 m or more. The outer margin is marked by an intermittent thicker rim consisting of remnants of lateral and terminal moraines. Because vegetation is well developed, this till is considered to be part of the St. Elias Advance.

Active glaciation is confined to the narrow valley along the upper half of Cub Creek. Unvegetated moraines bound the sides and ends of Cairnes Glacier but do not extend past the present ice position. Although this debris is unvegetated, it appears to otherwise resemble the St. Elias till.

Stratigraphy and Structure

The massive sulphide showing from which the float boulders were apparently derived occurs within volcanic rocks of the Alexander Terrane as defined by Read and Monger in 1976. This assemblage of rocks range in age from Cambrian through Carboniferous (?) and comprises a Cambro-Ordovician eugeoclinal sequence and a Devonian to Carboniferous (?) sequence of phyllites and carbonates. The Alexander Terrane is bounded to the northeast by Permo-Triassic volcanic and sedimentary rocks of the Taku-Skolai Terrane. The

northwesterly trending Duke River Fault separates these two regionally distinct groups of rocks. The Taku-Skolai Terrane forms a narrow northwesterly trending belt about two miles across which is in turn bounded to the northeast by Jurassic and Cretaceous sedimentary rocks of the Gravina-Nutzotin Belt. These two terranes are juxtaposed along the northwest trending Shakwak Fault. The geology is shown in simplified form on Figure 1 while further details are given in Table I on the following page.

The geology shown on Figure 1 incorporates unpublished mapping in July, 1977 by P.B. Read for the GSC, primarily within the Taku-Skolai Terrane. Most of the mapping within the Alexander Terrane is 1977 Archer, Cathro data, which is difficult to correlate with the GSC regional compilation in some cases because the relative ages of the various lithologies are not known with any certainty.

Alexander Terrane - Rocks within the Alexander Terrane comprise a consistently southwesterly dipping sequence of volcanic and sedimentary rocks. The stratigraphic succession is uncertain, however, and this sequence may be duplicated by thrust faults. Pervasive penetrative cleavage dips consistently southwesterly and is oriented subparallel to bedding.

Volcanic rocks (Unit Pv) are the major rock type within the Alexander Terrane in the vicinity of Cub Creek, although they comprise a lesser proportion of the assemblage elsewhere. The volcanics occur in two belts, one adjacent to the Duke River Fault and a second that is bounded on both sides by sedimentary rocks and apparently occurs much higher in the section.

TABLE I

Table of Formations for Alexander and Taku-Skolai Terranes
in the immediate vicinity of Cub Creek

<u>Era</u>	<u>Period</u>	<u>Thickness (m)</u>	
Cenozoic	Miocene and (?) younger	700	WRANGELL LAVAS (Tv) purplish-brown, blocky weathering, fine grained massive and/or porphyritic and locally vesicular andesite or basalt
	Oligocene and (?) older	400	AMPHITHEATER FM. (Ts) boulder conglomerate, coal, sandstone
Angular Unconformity			
TAKU-SKOLAI TERRANE			
Mesozoic	Upper Triassic	0-400	MCCARTHY FM. (u _R mc) thin bedded limestone and argillite
		0-700	NIZINA AND CHITISTONE LIMESTONE (u _R cc) massive limestone, limestone breccia, minor thin bedded limestone at top gypsum near base
		0-1000	NIKOLAI GREENSTONE (u _R nv) dark green and maroon amyodaloidal metabasalt and meta-andesite; pillow lava, volcanic breccia and conglomerate at base
Paleozoic or Mesozoic	Upper Permian or Lower Triassic		(P _R ub) - basic and ultrabasic intrusions
Paleozoic	Pennsylvanian and Permian	0-1200	STATION CREEK FM (Pssv) tuff, breccia, siliceous argillite, chert; rare meta-andesite flows
		0-2000	(Psv) - tuffaceous argillite, greywacke, pebble conglomerate

TABLE I (Cont)

<u>Era</u>	<u>Period</u>	<u>Thickness (m)</u>	
ALEXANDER TERRANE - separated from Taku-Skolai Terrane by the Duke River Fault			
Mesozoic and/or Paleozoic	Cretaceous or Permian and Triassic	200	(Pub) - basic and ultrabasic rocks; unfoliated gabbro and/or diorite and serpentinite; probably intrusive into other rocks
	Cambrian to (?) Carboniferous	200	(Ps) - undifferentiated sedimentary rocks, mainly grey graphitic calcareous and non- calcareous phyllite; rusty brown weathering, non-calcareous phyllite; minor brown weathering, light green pyritic tuff and volcanics; maroon and green conglomerate
Paleozoic		50	(Pcu) - massive, light yellowish weathering grey limestone
		30	(Pcm) - thin bedded, dark brown weathering, dark grey limestone
		0-15	overlain by white gypsum or anhydrite
		50	(Pcl) - massive, light yellowish weathering, dark grey limestone
		?	(Pc) - limestone
		200	(Pv) - massive, dark to medium green, epidote-rich meta-andesite; southwest belt contains pillow lava and fragmented rocks; host rock to massive sulphide mineralization

Both horizons, termed the Lower and Upper Volcanics respectively, are mapped as Unit Pv because they are lithologically similar and may be a repetition of the same horizon by faulting. Penetrative cleavage is more intensely developed in the Lower Volcanics.

Both volcanic units are relatively resistant and weather medium green to brownish green. In the upper unit, pillows were seen in one locality and breccia is common near the massive sulphides but, in general, the rocks are homogeneous, massive and fine grained or porphyritic. The volcanics are generally andesitic in composition but appear to be more siliceous and acidic near the massive sulphides. Disseminated pyrite and pyrrhotite are common.

Limestone occurs in four main horizons. The lowest (unit Pc) apparently underlies the "Lower Volcanics" next to the Duke River Fault northwest of Cub Creek. These rocks were mapped only by Read and little is known about them. Unit Pcl is massive, light yellowish weathering and less than 50 m thick. West of Cub Creek, it appears to lie directly upon the Lower Volcanics. To the east, however, it is separated from the volcanics by tuffs and calcareous phyllite and the limestone either pinches out or grades laterally along strike into calcareous phyllite. A second carbonate horizon (unit Pcm) occurs about 100 to 150 m above the first and comprises thin bedded, dark brown weathering, dark grey limestone and dolomite less than 30 m thick. This carbonate unit is overlain by about 10 to 15 m of bright, white gypsum or anhydrite. The significance of this sulphate horizon is not certain. Read and Monger state that gypsum and anhydrite comprise the upper half of

the Chitistone limestone within the Taku-Skolai Terrane. Unless a second sulphate horizon occurs within the Alexander Terrane, these rocks may have been mismapped and might actually belong to the Taku-Skolai Terrane. A third limestone horizon (unit Pcu) about 50 m thick that is lithologically similar and possibly equivalent to unit Pcl occurs immediately above the Upper Volcanics.

Fine grained clastic rocks and minor conglomerate and tuff that separate the three carbonate units are called units Ps. The interval between Units Pcl and Pcm consists mainly of calcareous and non-calcareous grey graphitic phyllite interbedded with brown and light green weathering, pyritic tuff. Elsewhere, the unit comprises mainly non-calcareous, rusty brown weathering, grey phyllite. A thin band of green and maroon conglomerate less than 10 m thick underlies the upper volcanics (unit Py).

Mafic and ultramafic rocks (unit Pum) form a conformable sheet about 100 to 200 m thick that overlies unit Pcm. This unit consists of resistant, medium to coarse grained, unfoliated gabbro and/or diorite west of Cub Creek. whereas it is composed mainly of serpentinite to the east. The age and structural relationship of Unit Pm with surrounding rocks is not known.

Taku-Skolai Terrane - The rocks of the Taku-Skolai Terrane are intensely fractured and sheared but in general dip gently and become progressively younger from southeast to northwest. These rocks were only examined in detail near Cub Creek and descriptions of the various map units are taken, with minor modification, from Read and Monger. It is noteworthy that hand specimens of the Nikolai-Greenstone and Chitistone limestone and gypsum are

difficult to distinguish from similar lithologies within the Alexander Terrane. These units underly much of the area around Cub Creek and it is understandable that previous workers assumed that the Nikolai Greenstone was the source of the massive sulphides.

Tertiary Rocks - The youngest consolidated sediments in the district are the Oligocene or older Amphitheatre Formation sediments (Unit Ts) and conformably overlying Miocene or younger Wrangell Lavas (Unit Tv), which overlie rocks of the Alexander Terrane, the Taku-Skolai Terrane, and the Gravina-Nutzotin Belt. Isolated outcrops of intensely sheared conglomerate containing granitic boulders outcrop along Telluride Creek and have been correlated with the Amphitheatre Formation. Coal bearing sandstone intersected in the 1970 drilling is also part of this unit.

Purplish-brown, blocky weathering, fine grained massive and/or porphyritic, and locally vesicular volcanic rocks that outcrop east of Cub Creek and in several other nearby areas belong to the Wrangell Lavas. These flows occur extensively throughout the eastern fringe of the St. Elias Mountains according to Souther and generally consist of up to 1000 m of basalt, andesite, latite and minor rhyolite. Felsite, latite prophyry and diorite have been mapped in local areas, one of which occurs near Dusty River, about 50 km southeast of Cub Creek in Kluane Park and is associated with an interesting zone of hydrothermal alteration and Cu-Ag-Pb-Zn mineralization.

In the vicinity of Cub Creek, the Wrangell Lavas appear to be too basic in composition to host massive sulphides. However, despite the fact that the massive sulphides in the Cub Creek area occur within the Alexander Terrane,

published descriptions of the Wrangell rocks suggest that they could be favourable hosts for massive sulphide deposits elsewhere in the Kluane District.

Mineralization

Three distinctly different modes of copper mineralization have been found in the Cub Creek valley:

- (1) Massive pyrite containing commercially interesting copper and zinc values with lower amounts of lead, silver and gold. This type makes up the original float boulder discovery and was found in place in 1977 near the ridge crest above the Cairnes Glacier.
- (2) Chalcopyrite with pyrite and pyrrhotite in quartz carbonate veinlets. This type contains no zinc or lead and is characterized by its low to moderate nickel values.
- (3) Native copper reported from a 1962 drill hole.

Assays of selected specimens of the first two types obtained in 1977 and by previous workers are summarized in Table II on the following page.

The presumed source of the sulphide boulders in Cub Creek is located about 3 km north-northwest of Mt. Cairnes, near the crest of a ridge at an elevation of about 8300 feet. It is a massive sulphide occurrence situated in the proper geographical position relative to the glacier to have produced the mineralized float that was found in the medial-terminal moraine at the mouth of Cub Creek and is surrounded by the same host rocks that are represented in the moraine. The showing occurs on a slight ledge in an

TABLE II

Assays of Mineralization - Cub Creek Property

<u>Sample No.</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>% Ni</u>	<u>oz/ton Ag</u>	<u>oz/ton Au</u>	<u>Description of Sample</u>
<u>TYPE 1 MINERALIZATION</u>							
H21025	1.40	0.40	13.9	<0.01	1.36	0.003	Grab sample from largest boulder of massive sulphides
Y-1145 Atlas, 1970	5.30	NA	6.82	.01	1.20	.02	Grab sample from largest boulder of massive sulphides
Coranex 1965	1.6	NA	4.4	TR	0.2	TR	Average of six channel samples taken perpendicular to the layering of the sulphide boulders
H-21026	0.50	0.02	5.22	<0.01	0.22	< 0.003	Composite sample of massive sulphide showing
Average of H-21027/8/9	0.08	<0.01	0.17	<0.01	0.13	< 0.003	Disseminated sulphides beneath massive sulphides
Y-1146 Atlas, 1970	0.25	NA	3.96	TR	0.56	TR	Massive sulphide float 3000 m above mouth of Cub Creek
<u>TYPE 2 MINERALIZATION (Froberg Showing)</u>							
Gaymont 1958	18.90	NA	TR	0.40	0.22	0.10	Large chalcopyrite-rich partly weathered, aggregate of massive sulphides
Gaymont 1958	1.15	NA	2.75	1.85	NIL	0.02	Massive pyrrhotite-chalcopyrite-sphalerite intergrowth

TABLE II (Cont)

<u>Sample No.</u>	<u>% Cu</u>	<u>% Pb</u>	<u>% Zn</u>	<u>% Ni</u>	<u>oz/ton Ag</u>	<u>oz/ton Au</u>	<u>Description of Sample</u>
<u>TYPE 2 MINERALIZATION (Froberg Showing)</u>							
Gaymont 1958	3.05	NA	NIL	0.11	NIL	NIL	Silicified host rock mineralized with pyrite, chalcopyrite and pyrrhotite
Gaymont 1958	1.00	NA	NIL	0.21	NIL	NIL	Silicified host rock with scattered pyrite and chalcopyrite
H-21034	0.46	<0.01	0.02	0.23	0.12	<0.003	Quartz-carbonate with pyrite- chalcopyrite aggregates, malachite stained
H-21034A	1.15	<0.01	0.01	0.86	0.20	0.005	Fine grained volcanics (?) with disseminated chalcopyrite and pyrite

NA - not assayed

TR - trace

Samples H-21025-21034A were collected by Archer, Cathro in 1977 and assayed at Chemex Labs, North Vancouver. ~~Sample H-21034A also assayed 0.036 oz/ton Pt and 0.150 oz/ton Pd.~~

extremely steep location that is usually snow covered, which may explain why it has not been found before. The unusually warm weather in early August of this year resulted in ideal conditions for prospecting this cliff face. The sulphide showing lies well off the Tell claim group and is about 5000 m from the main cluster of float.

The massive sulphides occur within the "Upper Volcanics" of the Alexander Terrane and form a lens between 1 and 2 m wide and less than 30 m long. Relationships between the volcanics and the sulphides are not certain as the showing was examined only once in a snowstorm. However, contacts are very sharp and the sulphide body appears to be oriented parallel to regional trends of bedding. The host rocks in the immediate vicinity of the deposit appear to be somewhat more siliceous than they are elsewhere but the sulphides do not appear to occur along any well defined lithological contact.

Textures and metal ratios of the mineralization are identical to the float found in Cub Creek. Both consist mainly of fine grained pyrite with lesser sphalerite, chalcopyrite, quartz, carbonate and minor galena. Distinct banding up to several centimetres across is common and is defined by variations in sphalerite content. As shown in Table II, metal ratios of the float and bedrock specimens are very similar.

A zone of disseminated sulphides which forms a rusty gossan up to 20 m wide and 200 m long occurs immediately beneath the main massive sulphide showing. The volcanics in this zone are cherty and siliceous. Pyrite is abundant both as veinlets up to 2 cm wide and as disseminations. Malachite

is common on fracture surfaces but very little chalcopryite was seen. This zone of disseminated sulphides may be associated with the main zone of massive sulphides but assays of two representative samples given in Table II show that the copper, lead and zinc content is very low.

The second type of sulphide occurrence, originally found by Gaymont Prospecting Syndicate and described in reports by J.R. Woodcock of Coranex Syndicate, is located immediately below the showings and just above the valley floor. Pyrite, pyrrhotite and chalcopryite occur in quartz-carbonate veinlets up to several cm across within an area about 2 m wide and 6 m long. The quartz carbonate appears to occur along the margins on a mafic sill or dike within phyllites of Unit Ps. Gaymont considered this occurrence to be the source of the boulders although all its specimens, except one, assayed low in zinc and contain a substantially higher nickel content, suggesting a completely different origin from the massive sulphide type of mineralization. Also, the pyrrhotite-bearing sulphides are not massive and textures are different from those in the boulders, supporting the view that it is highly unlikely that this occurrence is the source of the boulders near the mouth of Cub Creek. The Gaymont specimen containing both zinc and nickel was probably collected from a showing containing two stages of mineralization, or represents a mixture of different types of float.

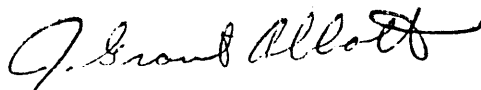
The only other reported mineral occurrence in the area is minor native copper intersected in a hole drilled by Canex Aerial Exploration in 1962. This type of mineralization probably occurs within the Nikolai Greenstone but was not seen in the 1977 work.

EXPLORATION POTENTIAL

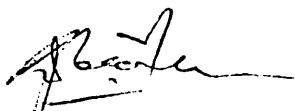
The massive sulphide occurrence has little economic potential because it is small and well exposed and because its difficult topographic setting would make further exploration very costly. However, it is a significant showing because its metal ratios, textures and setting suggest that it is a volcanogenic, exhalative deposit. The possibility of finding similar deposits is slim, however, because no other significant base metal occurrences of this or any other type are known to occur within the Alexander Terrane. Moreover, most of the area underlain by the Alexander Terrane occurs within Kluane National Park and cannot be explored. The Alexander Terrane probably continues to the southeast beyond the boundaries of the Park into northeastern British Columbia, an area bounded by the Haines Road to the east and Alaska to the south and west (see Figure 1). Geological mapping is still incomplete in this area and exploration would be difficult because the topography is unusually rugged and glacial cover is extensive.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES LTD.



J.G. Abbott, B.A.Sc., M.A.Sc.



R.J. Cathro, B.A.Sc., P.Eng.

Figure 2. View southward across Telluride Creek and up Cub Creek. Note the limits of the St. Elias till, the position of the massive sulphide occurrence and that of the boulders derived from it.

Massive Sulphide Showing

St. Elias Tuff

Massive Sulphide Boulders

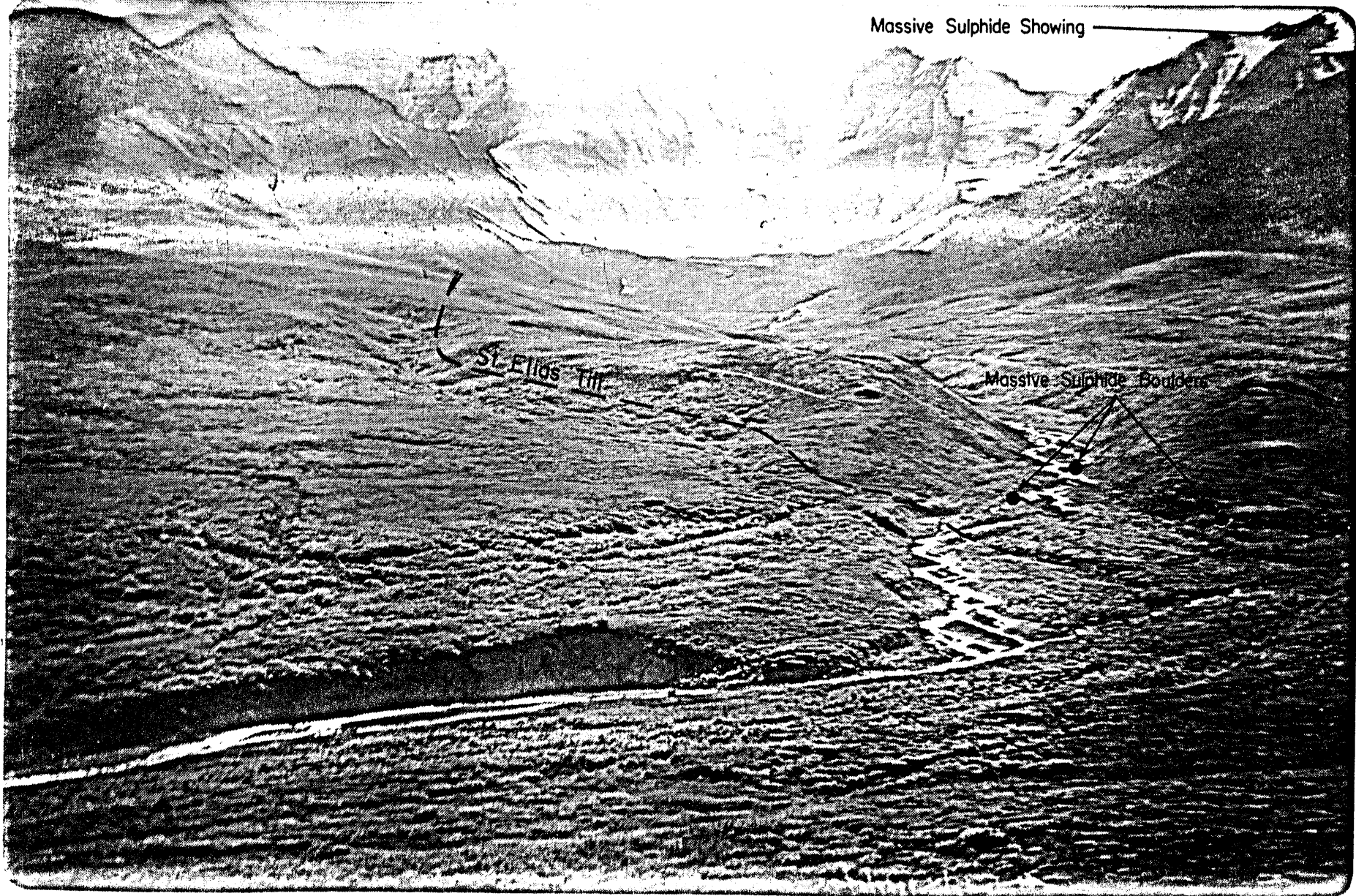


FIGURE 3

Figure 3. Typical Ruby till along Telluride
Creek. Note the small, rounded boulders
and compare with the St. Elias till in
Figure 4.

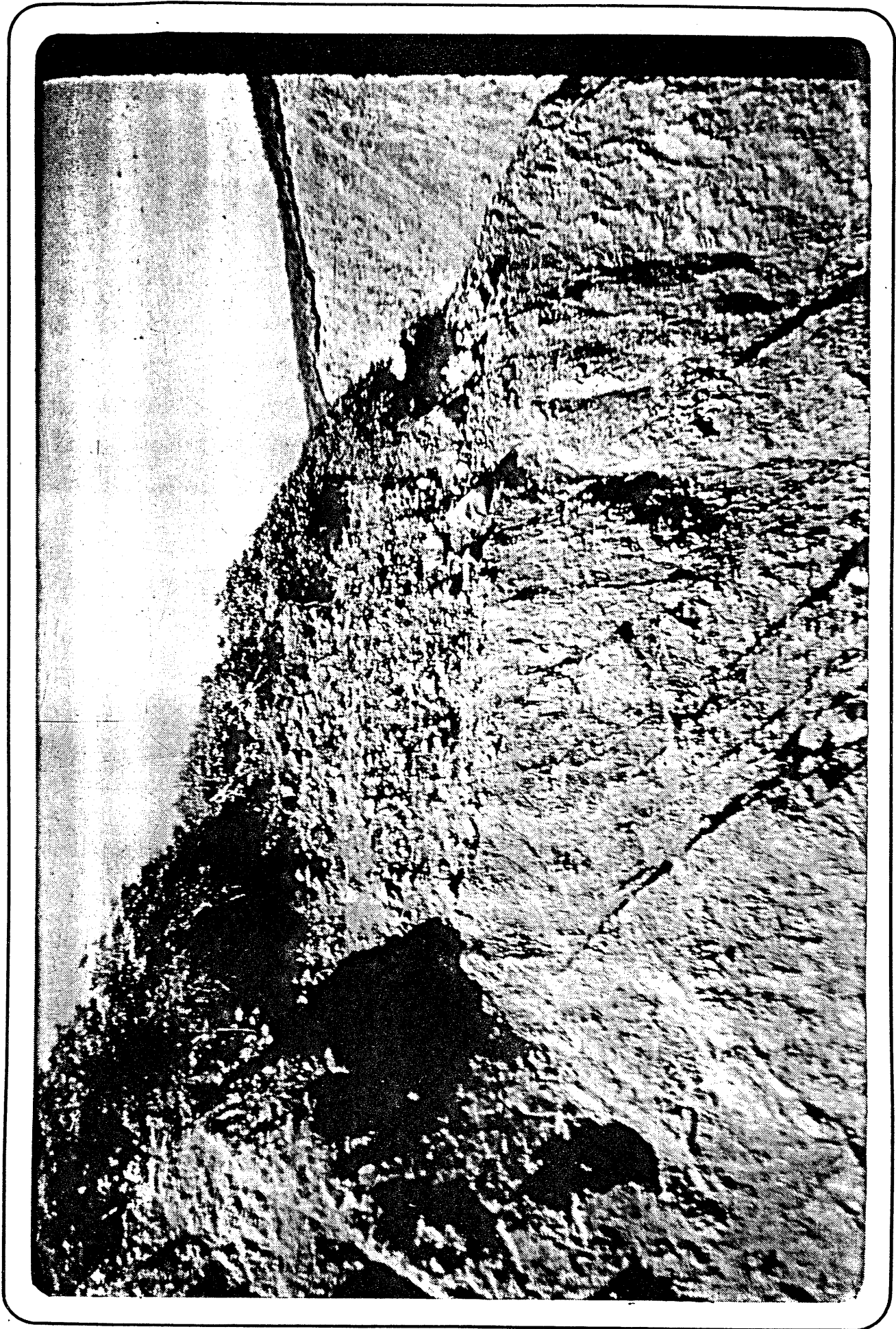


FIGURE 3

Figure 4. View southward along Cub Creek towards
Caines Glacier. Note the large angular
boulders of the St. Elias Advance in the
foreground.

DIAND - YUKON REGION, LIBRARY

Figure 4. View southward along Cub Creek towards
Caines Glacier. Note the large angular
boulders of the St. Elias Advance in the
foreground.

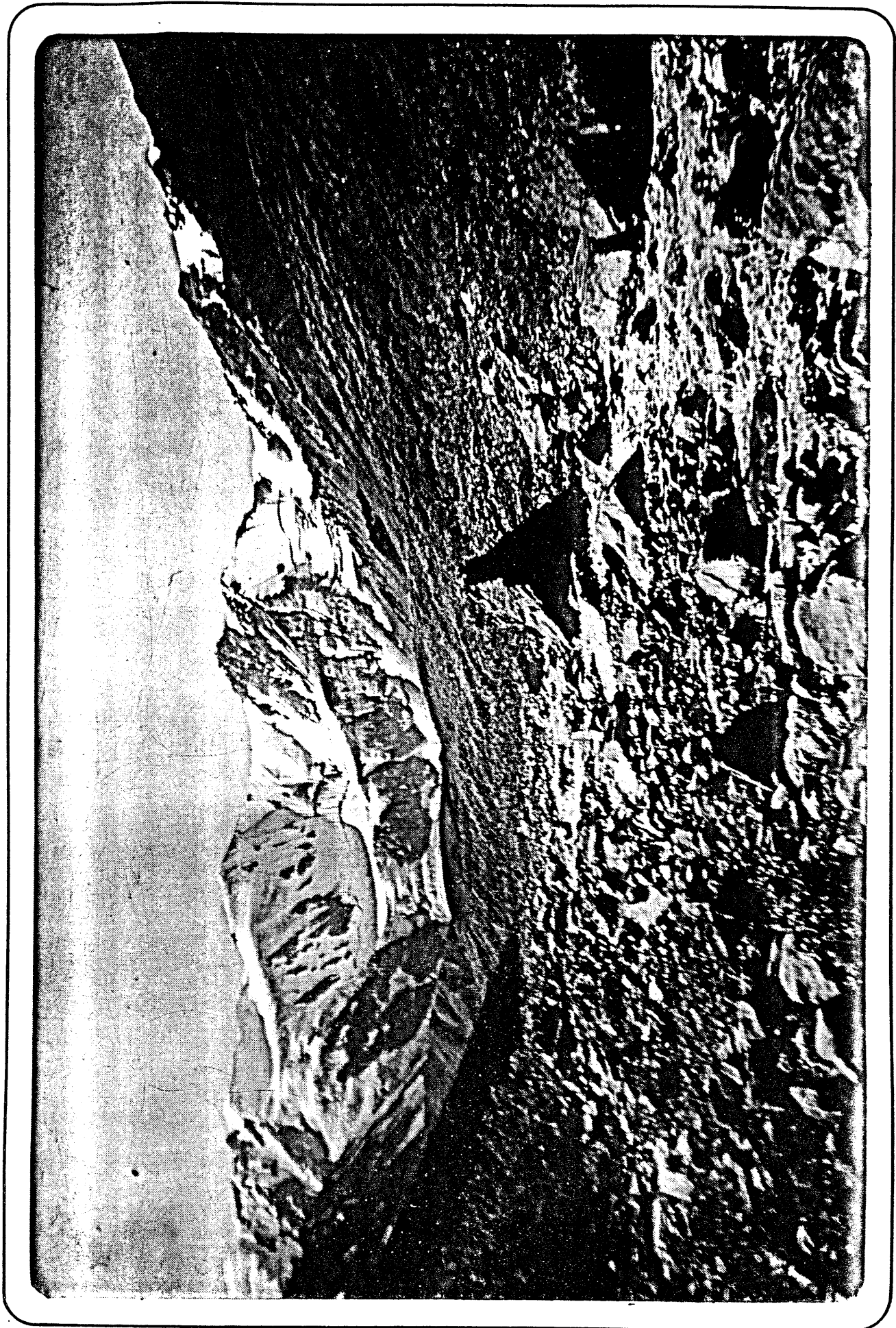


FIGURE 4

Figure 5. The major massive sulphide boulder in Cub
Creek. Note the laminations in the sulphides
and minor fold in the upper left hand corner.



Figure 6. View looking northwest across Cairnes Glacier.

The gossan near the top of the picture marks
the zone of disseminated sulphides immediately
beneath the massive sulphides.

MASSIVE SULPHIDE SHOWING



FIGURE 6