GEOLOGICAL
SURVEY
OF
CANADA

DEPARTMENT OF ENERGY,
MINES AND RESOURCES

PAPER 69-55

THE MINERAL INDUSTRY OF YUKON TERRITORY AND SOUTHWESTERN DISTRICT OF MACKENZIE, 1968

D. C. Findlay

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ABSTRACT

This report summarizes developments in the mineral industry of Yukon Territory and southwestern District of Mackenzie during 1968.

The value of Yukon mineral production for 1968 was about 23.5 million dollars (preliminary figure), up significantly from 1967 production of 15 million dollars. The increase mainly reflects the effects of the first full year's asbestos production (10.2 million dollars) from the Clinton Mine of Cassiar Asbestos Corporation Limited and the increased copper production (over 12 million pounds) from New Imperial Mines Limited Whitehorse Copper Belt operations. Offsetting these increases somewhat was decreased production from United Keno Hill Mines Limited silver-lead-zinc operations at Elsa due to reorganization and consolidation of mining and ancillary facilities in the camp. In addition to these major producers, two small silver-gold mines commenced production in 1968 - the Arctic Caribou Mine of Arctic Gold and Silver Mines Limited near Carcross in southern Yukon, and the Heustis property of Mount Nansen Mines Limited, about 40 miles west of Carmacks.

Anvil Mining Corporation Limited continued preproduction work on its large-tonnage Faro lead-zinc deposit in the Anvil Range area. Initial production is scheduled for September of 1969.

Lode exploration continued active in the territory in 1968, with about 75 companies and syndicates engaged in various exploration and prospecting programs. Several significant new prospects were tested by diamond drilling, including the White River copper showing of Silver City Mines Limited (United Pemetex Limited) and the Wernecke Mountains copper-zinc-silver occurrence of Hart River Mines Limited. Exploration of both these properties was continuing in 1969.

Placer gold production in 1968 (11,727 crude ounces) continued at about the same level as 1967 (11,837 crude ounces) with 29 operators producing more than 30 ounces of crude gold. As in the past, the bulk of production was from the Klondike area.

In Nahanni District (southwest District of Mackenzie) the Canting Mine of Canada Tungsten Mining Corporation continued to be the only producing mine. In 1968, 3,584,920 pounds of tungsten concentrate and 645,000 pounds of copper were produced. In exploration in the district, a tungsten prospect near the Yukon-Northwest Territories border was investigated by American Metal Climax Incorporated.

THE MINERAL INDUSTRY OF YUKON TERRITORY AND SOUTHWESTERN DISTRICT OF MACKENZIE, 1968

INTRODUCTION

This is the eighth annual review of Yukon mineral industry published by the Geological Survey since 1961. For earlier records, readers are referred to Annual and Summary Reports of the Geological Survey from 1898 through 1933. Although most of the older reports are now out of print many of them have been collected in a single volume (Bostock, 1957) which is available. Mineral industry records for the period 1934 to 1940 are summarized by Bostock (1935, 1936b, 1937, 1938, 1939 and 1941). Reports in the present series were compiled by Skinner (1961, 1962); Green and Godwin (1963, 1964); Green (1965, 1966); and Findlay (1967, 1969).

The information in this report was obtained from visits to properties, from discussion and correspondence with company personnel, from various newspapers and trade journals, and from reports of the Mining Recorders at Dawson, Mayo, Watson Lake, and Whitehorse.

Acknowledgments are extended to individuals and companies engaged in the mineral industry in Yukon Territory and to members of the Department of Indian Affairs and Northern Development. Their co-operation in providing information has expedited the preparation of this report.

TRANSPORTATION FACILITIES

Whitehorse (pop. 7,500) is the capital and main distribution centre of Yukon Territory. It is serviced by ship and rail from Vancouver via Skagway (White Pass and Yukon Route) and by truck and air from Vancouver and Edmonton. Scheduled commercial air flights provide daily connections with Vancouver and Edmonton (CP Air) and with Alaska (Wien Consolidated Airlines). Buses (Canadian Coachways Limited) operate within the territory and connect to Edmonton and Vancouver via Dawson Creek, British Columbia.

A secondary highway system links the main Yukon communities and provides the basic internal transportation network. The system includes four principal routes; the Alaska Highway (Watson Lake-Whitehorse-Alaska), the Whitehorse-Mayo-Keno road, the Stewart Crossing-Dawson road and the newly completed Watson Lake-Ross River-Carmacks road. Various lesser

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Ottawa, Ontario.

access roads connect the main highway network with smaller settlements and mining centres. The Federal and Territorial governments both share in construction costs of access roads for mining, forestry and agriculture purposes.

Fexed-wing aircraft are available for charter at Whitehorse, Watson Lake, Ross River and from time to time at Mayo and Dawson. Helicopters are based at Whitehorse and Watson Lake and at various other communities intermittently during the summer.

Table I lists costs of transportation modes in Yukon Territory.

MINERAL PRODUCTION OF YUKON

Table II shows Yukon mineral production figures for 1966 to 1968 inclusive, as well as cumulative totals to the end of 1968. In 1968 the value of mineral production reached 23.5 million dollars*, up from 15 million dollars** in 1967. This increase was due principally to the achievement of the first full year's production of copper and asbestos from New Imperial Mines Limited Copper Belt operations (6.6 million dollars) and from the Clinton Mine of Cassiar Asbestos Corporation Limited (10.2 million dollars). Additional increases were due to minor silver-gold production (totalling $194,400) from Arctic Gold and Silver Mines Limited and Mount Nansen Mines Limited. Offsetting these increases somewhat was the value of silver-lead-zinc production from the Elsa operations of United Keno Hill Mines Limited which declined from 9.1 million dollars in 1967 to about 6 million dollars in 1968.

The data of Table II show that the Yukon mineral industry enjoyed a healthy year in 1968 and there is every reason to believe that its expansion will continue in the near future. The large open-pit lead-zinc deposit (Faro Mine) of Anvil Mining Corporation Limited will be brought into production in the fall of 1969, adding about 55 million dollars annually in value of concentrate sales when full production is achieved in 1970-71. Production from the Clinton Mine of Cassiar Asbestos Corporation should increase to a value of about 14 million dollars in 1969, barring unforseen market changes. In addition to these factors, a small silver-gold mine in the Carcross area (Venus Mines Limited) is being prepared for possible production in 1969. In consideration of the above the total value of mineral production for Yukon in 1969 should approximate 30 million dollars.

PLACER GOLD PRODUCTION OF YUKON

Yukon placer gold production for 1968 with comparative figures for 1967 is summarized in Table II. The slight overall decrease in production (11,728 crude ounces in 1968 as against 11,837 crude ounces in 1967) is due to lower recovery in the Mayo district, specifically, from Highet Creek. In the Klondike area, which provides the major share of annual production, recovery actually increased slightly in 1968 (8,733 crude ounces) over 1967 (8,213 crude ounces). The total number of operators producing more than 30 ounces of crude gold increased from 26 to 29 in 1968, with the 3 new operations being in the Klondike area.

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* Preliminary figure.
** Revised figure.

TABLE I

Representative Transportation Costs for Yukon Territory, 1968

RAIL AND BOAT (container ship every 2 weeks)

Ore and concentrates - Whitehorse to North Vancouver
Commodity rate on 30,000 lb. carloads

Lead or zinc concentrates	$16.00 per ton
Asbestos fibre	17.00 per ton

Mining equipment and related supplies - North Vancouver to Whitehorse
Commodity rate on 10,000 lb. carloads[1]

Machinery	$ 2.75
Petroleum products	3.15
Drilling mud, building materials	2.90

TRUCK

Basic rates - Whitehorse from Edmonton and Vancouver

Pounds	100	5,000	10,000
From Edmonton			
dollars per 100 lb.	7.25	5.50	5.35
From Vancouver			
dollars per 100 lb.	8.23	6.90	6.38

(Commodity rates in effect for many items.)
(Backhaul rates considerably less.)

BUS (3 times per week, daily in the summer)

Express rates - Whitehorse from Edmonton and Vancouver

Pounds	1-2	2-10	10-20	40-50	90-100
From Edmonton					
dollars	2.05	2.55	3.40	6.40	11.35
From Vancouver					
dollars	2.65	2.85	4.00	7.85	14.20

[1] Per 100 lbs.

Table I (cont'd.)

AIR (daily)

Air express and air freight - Whitehorse from Edmonton and Vancouver

	Edmonton to Whitehorse	Vancouver to Whitehorse
Air express		
minimum	5.00	5.00
dollars per pound	43	49
Air freight		
minimum	5.25	5.25
dollars per pound	.21	.21
dollars per 100 pounds	18.00	18.00

CHARTER AIRCRAFT

Type	Rate per hour	Rate per mile
Fixed Wing		
Cessna 180	$ 65.00	$ .55
Beaver	80.00	.80
Aztec	120.00	.65
Otter	120.00	1.20
DC-3	200.00	1.45
Twin Otter	250.00	1.50
Helicopter		
Bell 47G-2	115.00 (fuel and oil included)[2]	[2]
Bell 47G3-B1	140.00 (fuel and oil included)[2]	[2]
Bell 47G-4	135.00 (fuel and oil included)[2]	[2]
Hiller 12E	135.00 (fuel and oil included)[2]	[2]
Bell 206A (Jet Ranger)	225.00 (fuel and oil included)[2]	

[2] Rate per mile not applicable.

TABLE II

Mineral Production of Yukon Territory[1]

Product		1966	1967[2]	1968[3]	Cumulative Totals (1886 to 1968 inclusive)
Gold	fine oz.	43,466	17,900	24,957	11,139,027
	$	1,639,103	675,725	941,128	263,030,876
Silver	fine oz.	4,194,580	3,869,374	2,061,534	152,085,662
	$	5,868,217	6,701,756	4,778,635	133,027,015
Lead	lb.	15,975,125	15,299,709	7,034,890	503,837,617
	$	2,386,684	2,141,959	951,117	56,276,462
Zinc	lb.	11,450,510	9,476,545	4,860,000	254,949,544
	$	1,729,027	1,373,151	685,260	34,422,678
Cadmium	lb.		94,999	50,750	2,782,493
	$		265,997	144,638	5,641,943
Copper	lb.		7,167,919	11,965,800	33,506,004
	$		3,409,779	5,755,550	12,267,112
Tungsten	lb.				32,169
	$				27,499
Platinum	fine oz.				19[4]
	$				1,553
Coal	tons	5,670	1,912		278,737
	$	46,390	15,791		2,567,312
Asbestos	tons		2,260	64,000	66,260
	$		406,371	10,240,000	10,646,371
Totals	$	11,975,757	14,990,529	23,496,328	517,908,821

[1] Figures from Dominion Bureau of Statistics (1957, and later releases).
[2] Revised figures for 1967, Dominion Bureau of Statistics.
[3] Preliminary figures for 1968, Dominion Bureau of Statistics (January, 1969).
[4] Produced in 1960.

TABLE III

Yukon Placer Gold Production, 1967 and 1968

District	Area	Number of operators[1]		Approximate production of gold (crude ounces)	
		1967	1968	1967	1968
Dawson	Klondike	15	19	8,213	8,733
	Sixtymile	3	3	350	527
	Stewart River	1		350	164
Mayo	Haggart Creek and Dublin Gulch	2	2	943	1,208
	Highet Creek and Johnson Creek	2	1	1,129	407
	Thunder Gulch	1	1	113	146
Whitehorse	Kluane	2	2	560	438
Miscellaneous production (various areas)		(10)	(7)	179	105
Totals		26	29	11,837	11,728

[1] With production greater than 30 ounces.

TABLE IV

Mineral Claims Recorded, Yukon Territory[1]

Mining District	1964	1965	1966	1967	1968
Dawson	48	441	738	220	403
Mayo	607	1,026	706	680	2,115
Watson Lake	349	690	4,828	2,183	2,091
Whitehorse	1,819	5,456	11,666	4,295	3,948
Totals	2,823	7,613	17,938	7,378	8,557

[1] Figures supplied by the Department of Indian Affairs and Northern Development.

LODE EXPLORATION IN YUKON

The active pace of exploration in 1966 and 1967 continued at about the same level in 1968 with about 75 companies participating in various exploration and development programs in the territory. Of this total about 20 are major mining organizations. Table IV, showing Mineral Claims recorded in Yukon in 1968 and previous years, illustrates that this index of activity was about the same as 1967.

In the Whitehorse Mining District 3,948 new claims were recorded in 1968 (Table IV) and exploration and development programs were carried out in various parts of the district. In Dawson Range, Casino Silver Mines Limited did additional geochemical survey work on its Casino Creek-Canadian Creek silver-lead-(copper?) prospect. Yukon Revenue Mines Limited began reinvestigation of the old Revenue Creek copper prospect west of Freegold Mountain and late in the season initiated a diamond drilling program on the property. South of the Freegold area, Mount Nansen Mines Limited continued development work on its silver-lead property and in the fall of 1968 commenced production.

The Kluane Range area was not as active as in 1967 but Hudson Bay Exploration and Development Company Limited re-examined parts of its Wellgreen nickel-copper property at Quill Creek and in the southeastern part of the belt a new copper discovery of the Mush Lake type was made by Jack Pot Copper Mines Limited near Tatshenshini River, close by the historic Dalton Trail.

In southwest Yukon, United Pemetex Limited, formed by partners Central Del Rio Oils Limited and Silver City Mines Limited, drilled its Upper White River copper prospect with interesting results. Considerable staking took place in Upper White River area in late 1967 and early 1968, but although several companies were active here during the 1968 season no significant new discoveries were reported. Twenty miles downstream on White River, Discovery Mines Limited carried out an underground drilling program on the old Canalask Nickel property (now Micro Group), but results were not encouraging and the operation was terminated in early August.

Near Whitehorse, New Imperial Mines Limited continued copper production from its Little Chief open pit and early in the summer began mining from the nearby Arctic Chief pits also. Surface exploration was continued on the company's Copper Belt holdings and in 1969 the third property in this series - the War Eagle - will enter production. Farther south, in the Carcross area, Arctic Gold and Silver Mines Limited commenced production from its Arctic Caribou silver-gold property in May, 1968. On the other side of Montana Mountain from the Arctic Caribou, on Windy Arm of Tagish Lake, underground exploration and development work continued on the silver-gold property of Venus Mines Limited.

Northeast of Whitehorse in Anvil Range area, Anvil Mining Corporation Limited continued preparing its 63 million-ton Faro lead-zinc deposit for production in late 1969. In addition, the company continued surface exploration on other of its numerous properties in the region. Farther west, in adjacent Glenlyon area, McIntyre Porcupine Mines Limited did limited diamond drilling on a copper prospect optioned from Glenlyon Mines Limited. Southwest of Ross River in the Quiet Lake area, Atlas Explorations Limited optioned a new tungsten showing near Fox Mountain late in the season.

In Dawson Mining District, asbestos production from the Cassiar Asbestos Corporation's Clinton Mine settled down to routine as the mine

completed its first full year of operation. Eighty miles northeast of Dawson, Hart River Mines Limited did surface exploration and diamond drilling on its new copper-silver-zinc prospect in Wernecke Mountains. Elsewhere in the district Connaught Mines Limited carried out bulldozer trenching and minor drilling on its Mosquito Creek silver-lead prospect in Sixtymile area, and the Orekon Syndicate continued bulldozer work on a gold-silver-lead prospect on King Solomon Dome in the Klondike.

The Mayo Mining District had a busy season in 1968, with over three times as many claims staked than in 1967 (Table IV). Most activity was centred in the Hess River-Bonnet Plume River areas. In the former, Atlas Explorations Limited carried out reconnaissance exploration programs in the Fairweather Lake area. In Bonnet Plume area, Bonnet Plume River Mines Limited continued exploration of its Mammoth Group and vicinity, where interesting copper-cobalt discoveries were made last year. Other companies active in this general region, included Cyprus Exploration Corporation Limited, and Newmont Mining Corporation Limited. In the Elsa area United Keno Hill Mines Limited continued development work (drilling and shaft-sinking) on its new Husky Mine and also did extensive overburden-drilling exploration in the immediate Galena and Keno hills area. Further surface work was also completed on the company's Mount Hinton gold-silver prospects. Elsewhere in the general Elsa district several other companies were active and at least two new silver-lead prospects were discovered, one south of Clark Lakes and the other on the north flank of Galena Hill. In Davidson Range across McQuesten Valley from Keno Hill, Arrow Inter-America Corporation carried out an underground exploration program on the Stand-To Hill silver-lead property optioned from Foley Silver Mines Limited.

In the Watson Lake Mining District, Atlas Explorations Limited continued regional exploration in Sheldon Lake (105J[1]) and Finlayson Lake (105G) areas as well as carrying out detail investigations on several properties, notably the Pay property east of Fortin Lake. Here, diamond drilling was done to test an extensive zinc geochemical anomaly accompanied by minor sulphide mineralization in place. In the Canol road area Canol Mines Limited continued exploration of its silver-lead prospect near the headwaters of Groundhog Creek. Elsewhere in the district, Bruce Lake Mines Limited drilled a nickel prospect near the Watson Lake-Ross River road southeast of Ross River, and in the Ketza River area Stump Mines Limited did underground exploration work on several silver-lead veins on its own property and on adjoining property of Silver Key Mines Limited. On the East Arm of Frances Lake, Matt Berry Mines Limited resumed a drilling program late in 1968 that was begun in 1966 to test a silver-lead prospect near Thompson Creek. East of Frances Lake, Monarch Metal Mines Limited began a drilling program late in 1968 to test a silver-lead-zinc prospect in the Mount Billings area. Near the Alaska Highway, Boswell River Mines Limited carried out surface exploration on its lead-zinc prospect near Crescent Lake, north of Swift River. Late in the season the company transferred its operations to its Fox molybdenum property on Slate Mountain south of Boswell River in the Whitehorse Mining District.

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[1] Refers to National Topographic Series index systems. Each numbered and lettered sheet (e.g. 105G) comprises a 4-mile-to-1-inch scale map.

MINERAL PRODUCTION AND EXPLORATION
NAHANNI MINING DISTRICT, DISTRICT OF MACKENZIE

The only producing mine in Nahanni District is the Cantung Mine of Canada Tungsten Mining Corporation on upper Flat River, near the Yukon border. In 1968 full production was resumed from the mine after only minor production was recorded in 1967 due to a rebuilding program necessitated by a serious fire which destroyed the mill in December of 1966. Production for 1968 was 179,246 STU's[1] WO_3 and 645,000 pounds of copper from 116,600 tons of ore milled.

Elsewhere in Nahanni District, Redstone Mines Limited continued exploration of its copper prospects in the Little Dal Lake-Plateau Lake area and in the MacMillan Pass area, near the Yukon-Northwest Territories border, American Metal Climax Incorporated drilled its 'Cirque Lake' tungsten prospect.

A total of 2,091 claims were recorded in the district in 1968, a decrease of 92 from 1967. The Mining Recorder's office for the district is in Watson Lake, Yukon.

WORK BY THE GEOLOGICAL SURVEY DURING 1968
YUKON AND SOUTHWEST DISTRICT OF MACKENZIE

Geological Survey personnel continued a number of specialized investigations in Yukon in 1968 and preparations were made for a helicopter-supported 4-mile mapping program (Operation Stewart) to begin in 1969 in Nadaleen River (106C), Bonnet Plume Lake (106B), Lansing (105N) and Niddery Lake (105O) map-areas. With the exception of the Snag (115J and K) and Aishihik (115H) areas this is the last block in Yukon remaining to be geologically mapped on a reconnaissance basis.

In southern Yukon and adjacent British Columbia M. B. Lambert (21-23)[2] completed field studies of the Skukum Group volcanics in the Bennett Lake area in parts of Wheaton River (105D/5) and Homan Lake (104M/14) map-areas. The field studies have shown that this crudely oval-shaped structure formed as a result of cauldron subsidence associated with explosive volcanism and thick accumulations of pyroclastic rocks.

J. W. H. Monger (23-27) completed field studies of the late Paleozoic rocks of the Atlin Horst. Although most sections examined in detail in connection with this project are in the Atlin district of British Columbia, localities in Whitehorse (105D) and Teslin (105C) map-areas were examined briefly for comparison with rocks of the Atlin district.

In the Anvil-Vangorda district, D. J. Tempelman-Kluit (38-39) completed detailed studies of the structure and stratigraphy of Paleozoic rocks north of Tintina Trench that contain the base metal deposits of this region. The phyllitic rocks originally believed to be Mississippian and included in 'unit 7' rocks (Roddick and Green, 1961a) are now designated 'unit 3' by Tempelman-Kluit. Unit 3 is divided into a lower, 1,000-foot-thick

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[1] STU = short ton unit = 20 lbs.

[2] (21-23) Refers to page numbers in Geol. Surv. Can. Paper 69-1 Part A; Report of Activities, April to October, 1968, where the original descriptions are contained.

quartz-rich phyllitic member that contains the known sulphide deposits, and an upper 3,000-foot-thick nonquartzose phyllitic member with numerous greenstone lenses and horizons of phyllitic tuff. Tempelman-Kluit (41) also carried out a reconnaissance traverse across the west-central part of Bonnet Plume Lake map-area (105B) to obtain preliminary structural and stratigraphic information for Operation Stewart.

In connection with nation-wide investigations into deposits of specific mineral commodities G.A. Gross (111-112) examined magnetite iron-formation near Shell Creek in Dawson map-area (116B and C). Gross noted that the Shell Creek occurrence is an 'Algoma-type' iron-formation and that it consists of interbanded black slaty magnetite facies and thin-banded chert magnetite facies that are closely associated with quartz-chlorite and quartz-mica-schists that are 'most probably of volcanic origin'. As a part of a continuing study of Canadian lead and zinc deposits, D.F. Sangster (117-118) made brief visits to properties in the Anvil-Vangorda district. Sangster notes that in the western Cordillera the most productive rocks, from the point of view of lead-zinc deposits are late Proterozoic to Middle Cambrian sediments.

Surficial and Pleistocene geology studies were continued in two areas in Yukon in 1968. O.L. Hughes (209) studied Pleistocene sections along Old Crow and Porcupine rivers (116O, N (east half) 117A, B) and J.T. Gray (62-63) continued studies of mass-wasting rates and mechanisms in Bear River valley (106D) and the Tombstone River area of Ogilvie Mountains (116B, C).

LODE MINING AND EXPLORATION

MAYO MINING DISTRICT

GALENA AND KENO HILLS AND ADJACENT AREAS

UNITED KENO HILL MINES LIMITED — Silver-Lead-Zinc
7 King Street East, — (about 63°55'N, 135°29'W)
Toronto, Ontario.

Selected References: Boyle (1956; 1957; 1965; 1968); Green and McTaggart (1960); McTaggart (1960); Skinner (1961, pp. 21-25; 1962, pp. 22-27); Green and Godwin (1963, pp. 5-8; 1964, pp. 7-12); Green (1965, pp. 7-12; 1966, pp. 10-17); Gleeson (1966; 1967); Findlay (1967, pp. 18-21; 1969, pp. 20-24).

During 1968, United Keno Hill Mines Limited completed streamlining of its silver-lead-zinc producing facilities at Elsa. As a result of the cutback in mill feed tonnages initiated in mid-1967, ore tonnage treated in 1968 decreased to 60,800 tons from 106,189 tons in 1967 and sale of concentrates decreased to $6,054,000 in 1968 from $9,112,000 in 1967. As in 1967, a significant factor in 1968 production statistics was the increased price received per ounce of silver in 1968 ($2.40 Canadian) over the price in 1967 ($1.78 Canadian). Following completion of mill modifications and consolidation of townsite facilities in Elsa in the late summer of 1968, rates of mining and milling steadily increased and by the end of the year mill production was running at 250-275 tons per day, an increase of about 75 tons per day over the same period in 1967. Development work on the new Husky Mine continued

about on schedule in 1968, in spite of flooding problems in the development shaft. New ore zones developed in the Elsa and Calumet mines provided encouragement for future operations.

The bulk of production ore in 1968 came from the Calumet Mine, principally from below the 400 level. In addition, development work was carried out on the 400, 500, 600 and 700 levels and a number of promising new mineralized zones are being investigated. From a total of 410 feet of lateral work, 120 feet of ore was developed (United Keno Hills Mines Limited, Annual Report, 1968).

In the Elsa Mine, 1,288 feet of lateral work provided 130 feet of ore (op. cit.). Most of the 1968 development work was concentrated on the 400 level, particularly from the 417AS drift which is being continued toward a projected intersection with the Flat Creek fault. In addition to work on the 400 level, an underground drilling program was carried out from the 200 level to test anomalous overburden drilling values in the footwall of the main workings. Additional drifting is planned to investigate this area.

In the Sadie Ladue Mine the rehabilitation program, begun in 1967, was continued in 1968 and a total of 361 feet of lateral development work was completed (op. cit.). The target area here is a footwall vein structure located by overburden drilling northwest of the Ladue No. 2 shaft. Access to the area is being gained through rehabilitation of the 200S drift between the Ladue No. 2 shaft and the Sadie shaft to the southwest.

The following summary of operating results for 1968 and previous years is from information provided by the company:

	1966	1967	1968
Dry tons milled	120,374	106,189	60,800
Daily average, tons	329.8	290.9	166.1
Mill heads:			
Silver (oz/ton)	36.56	37.69	33.93
Lead (%)	7.60	7.97	6.53
Zinc (%)	5.61	5.89	5.55
Metal production			
Silver (oz)	4,235,678	3,804,644	1,981,777
Lead (lb)	16,647,849	15,469,569	7,418,645
Zinc	11,999,953	10,872,074	6,212,589
Cadmium (lb)	144,914	128,269	74,042
Metal sales[1]	$8,777,558	$9,112,084	$6,053,715
Source of ore treated in mill			
Hector-Calumet mine (%)	51.0	67.4	91.9
Elsa mine (%)	11.2	10.9	8.1
Keno mine (%)	27.5	19.7	-
No Cash mine (%)	-	2.3	-
Comstock Keno mine (%)	4.3	2.0	-
Ore dumps	3.7	-	-
Ore reserves[2]:			
Tons	129,260	124,460	143,200
Silver (oz/ton)	37.2	38.6	35.7
Lead (%)	8.9	7.5	6.3
Zinc (%)	6.5	6.5	5.7

1 Without deductions for smelter charges, freight, and marketing.

2 Additional reserves, not presently economic for various reasons total 115,680 tons averaging 38.1 ounces per ton silver, 6.8 per cent lead and 5.4 per cent zinc.

Sinking of a planned 500-foot, 3-level development shaft on the new Husky zone near the Elsa school was begun in March, 1968. At a depth of 423 feet the shaft intersected a major fault (Brefault) and had to be terminated at this point due to flooding. Subsequent work was successful in controlling waterflood and development crosscut stations were established at the 125-, 250- and 375-foot levels. Drilling carried out from the 125- and 250-foot levels has indicated the existence of an orebody at least 500 feet in length (op. cit.).

During 1968 the company continued its overburden drilling exploration program and completed a total of 63,920 feet in 690 holes. Areas tested included: Husky Mine extension; footwall zone of the No. 17 vein, Elsa Mine; Porcupine Creek area; Dixie and Birmingham Mine areas; an area southwest of the Ladue No. 2 shaft, Sadie Ladue Mine; and, the south slope of Galena Hill opposite the Calumet Mine.

In outside exploration, a crew of 4 men spent the 1968 field season continuing the investigation of a number of gold and gold-silver veins on the south and west slopes of Mount Hinton (63°52'N, 135°04'W). Geochemical and geological surveys were completed and detailed sampling of the veins carried out. A test shaft was sunk to a depth of 25 feet on one of the larger veins. Although good gold and silver values have been obtained from several of the veins (galena-jamesonite-arsenopyrite-pyrite-sphalerite-chalcopyrite) the distribution of the precious metals is apparently erratic and this program will be suspended pending detailed evaluation of results to date.

Keno Hill

CRO-MUR MINING AND EXPLORATION COMPANY LIMITED
414 Ellice Street,
Princeton, British Columbia.

Silver-Lead
(63°57'N, 135°18'W)

References: Findlay (1967, pp. 21-22; 1969, p. 25).

This company holds a total of 64 claims on the west flank of Keno Hill, downslope from the old Wernecke Mine. The property is reached by a short access road leading off the Keno City-Wernecke Mine road.

In 1968, owner R. Murdoch, working with two part time helpers, a D-6 bulldozer and a small diamond drill continued exploration of a number of small veins on the upper part of the property ('Wernecke' claims). Trenching over the past three years has exposed a number of thin (up to 2 to 3 inches) quartz-carbonate-galena stringers in vein breaks cutting quartz-sericite-chlorite schist, greenstone, fine-bedded quartzite and graphitic quartz-mica schist. Work in 1968 was concentrated mainly on investigation of 3 narrow, subparallel sulphide stringers exposed in trenches east of (upslope from) the owner's cabin. Late in the season Murdoch commenced testing these veins by diamond drilling.

The original showing, located just west of the owner's cabin, was extended by bulldozer trenching parallel to the vein break. A grab sample of

oxidized vein material collected by the writer from the original showing in this trench (a 2- to 3-inch massive galena seam) assayed*: 116.8 ounces per ton silver, 72.4 per cent lead.

On the 48-claim Railroad group which comprises the western part of the property, surface exploration, including geochemical, magnetic and electromagnetic surveys were conducted in 1968. A number of geophysical anomalies were located and they are to be further investigated by bulldozer trenching.

DAVIDSON RANGE AREA

Stand To Hill

FOLEY SILVER MINES LIMITED — Silver-Lead
201 - 846 West Hastings Street, Vancouver, British Columbia. — (64°02'N, 135°10'W)

References: Cockfield (1922, p. 4A; in Bostock, 1957, pp. 479-498); Green and Roddick (1962, p. 19); Findlay (1967, pp. 25-26; 1969, pp. 27-28).

Arrow Inter-America Corporation, under an option agreement with Foley Silver Mines Limited, carried out an underground exploration program on the latter's Stand To Hill property in 1968. Working from an adit at an elevation of about 4,200 feet about 1,235 feet of drifting and crosscutting was completed between early July and the end of September. In addition, surface exploration, including bulldozer trenching was done elsewhere on the property.

The Foley Silver property, comprising 46 claims, is located on the north side of Stand To Hill in the headwaters area of Homestead Creek and about 7 miles north of Keno Hill. Access is by means of an 8-mile tote road that leaves the McQuesten-Hanson Lakes road 9.4 miles from its junction with the Elsa-Keno road.

The present property was staked in 1961 by the late J. Foley. Following some surface exploration by the Yukon Consolidated Gold Corporation in 1962 a private company - Foley Yukon Silver Mines Limited - did additional work on the claims during the period 1964-1966. Bulldozer trenching in the 1966 season uncovered an interesting silver-lead vein just above Homestead Creek. As exposed by the initial trenching the showing consisted of a rusty, gougy vein-break cutting greenstone and quartz-mica schist (unit 17, Green and Roddick, 1962) and carrying subparallel lenses and veins of quartz-siderite with disseminated to massive galena, sphalorite and minor chalcopyrite. Further trenching and blasting of the showing late in the 1966 season confirmed a near-surface width of 10 to 12 feet for the break and exposed it over a strike length of about 300 feet. Assays averaging 25 ounces per ton silver and 26 per cent lead were reported presumably obtained from several massive sulphide bands ranging from 0.5 to 1.5 feet in width within the break (Prospectus, Foley Silver Mines Limited, 1966).

During the 1967 season a total of 150 feet of drifting was completed in two adits driven along the vein structure. The main adit, collared at an elevation of about 4,400 feet, followed massive greenstone to the south for 96 feet. It showed that the vein structure decreased in width from 8 to 10 feet at

* Assayed by G. Spalding, Whitehorse, Yukon Territory.

the portal to about 3 feet, 15 feet in from the portal. About 65 feet below the main adit, a second adit was collared on the contact between the greenstone sill and shallow-dipping quartz-chlorite schist. This adit was driven about 20 feet in a southerly direction and at its face, a steeply west-dipping vein structure 2 1/2 feet wide and carrying quartz-carbonate with sparse galena is exposed. Assays from this structure reportedly yielded values up to 27.15 ounces per ton silver, 1.62 per cent copper and 9.25 per cent lead (Financial Examiner, January 27, 1968) whereas values from the main adit reportedly returned as high as 50 to 60 ounces per ton silver and 50 per cent lead (op. cit.). It is presumed that these assays represent selected specimens only, as channel sampling done by the present company in 1968 gave lower values across the vein widths. Samples collected by this writer from the original surface exposure assayed*: 61.5 ounces per ton silver, 77.3 per cent lead (character) and 3.52 ounces per ton silver, 5.2 per cent lead and 1.0 per cent zinc (chip sample across 12 feet).

The 1968 adit (No. 4) was collared in massive greenstone and remained in this rock type for about 400 feet, at which point finely-laminated quartzites and argillaceous quartzites were intersected. The sediments strike about N60°W and dip 25 to 35 degrees southwest. The adit was continued through the sedimentary section (about 200 feet wide) and was terminated in a mixed greenstone-sedimentary assemblage. Crosscuts were driven to the east (120 feet) and west (210 feet) of the end of the main entry and a 150-foot crosscut was driven east of the adit at a point about 350 feet from the portal. Although a number of thin quartz-carbonate stringers carrying minor galena and pyrite were intersected in the adit and crosscuts, mineralization of economic interest was not encountered. Based on the 1967 and 1968 underground work it appears that the original showing is essentially a near-surface 'blow-out' with little significant strike or depth extension.

WERNECKE MOUNTAINS AREA

HART RIVER MINES LIMITED
201 - 846 West Hastings Street,
Vancouver, British Columbia.

Copper-Zinc-Silver
(64°38'N, 136°52'W)

Hart River Mines Limited holds about 200 claims covering an area centred around the headwaters of a north-flowing tributary (Marc Creek) to Hart River in Wernecke Mountains. The property is about 80 miles northeast of Dawson and is accessible only by float-equipped aircraft or helicopter. Float planes can land at Two Beaver Lake, about 20 miles west of Marc Creek or at Marc Lake, 14 miles north of the property. During the 1968 season the company operated from a main base camp on upper Marc Creek and used a helicopter based on the property to ferry supplies from Marc Lake.

Initially discovered in 1966, preliminary work, including some packsack diamond drilling, was done on the main showing in 1967. From April to October 1968, the company carried out extensive surface exploration over the property, including prospecting, geological mapping and geochemical and geophysical (electromagnetic and magnetic) surveying as well as a diamond drilling program involving 31 holes totalling 6,400 feet on the main showing. A crew of up to 15 men was employed during the operation.

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* Assayed by G. Spalding, Whitehorse, Yukon Territory.

The area is underlain chiefly by Proterozoic/Cambrian sedimentary rocks, including argillite, quartzite, dolomite and limestone (units 1 and 2; Green and Roddick, 1962) and by Cretaceous(?) intrusive/extrusive rocks of dioritic composition (unit 20, op. cit.). The latter are sill-like bodies, apparently conformable and locally intercalated with the sedimentary rocks. They are massive, greenish, fine- to medium-grained rocks composed of plagioclase, pyroxene and/or amphibole (commonly chloritized) a little quartz and accessory magnetite. They exhibit few features unequivocally of intrusive or extrusive origin, and it seems probable that they are either intercalated lava flows or shallow intrusive bodies. The sedimentary and intrusive/extrusive rocks strike generally west in the property area. Company geologists have interpreted the local structure as a west-plunging anticline dislocated by a number of high-angle faults and at least one west-trending, south-dipping thrust fault.

The main showing lies about 2,500 feet east of Marc Creek at an elevation of about 4,100 feet. It consists of a west-trending, steeply south-dipping shear zone up to 30 feet wide that has been impregnated and partly replaced by disseminated to massive sulphides, chiefly pyrite, pyrrhotite, and chalcopyrite with subordinate sphalerite and minor galena. Sulphide mineralization occurs chiefly as replacement bands along original bedding planes in the argillaceous rocks, as massive lenses near the contact between 'diorite' and argillite and, less commonly as patchy replacement of the 'diorite'. The mineralized zone appears to dip steeply south, generally conformable with the diorite-argillite contact. Thickness of ore intersections in diamond-drill holes have ranged up to 200 feet, with sections carrying up to 5-6 per cent copper, 4-5 per cent zinc and about 1 ounce per ton silver over a few feet. Published diamond-drill hole assay results are:

Hole No.	Width (feet)	Au (oz/ton)	Ag (oz/ton)	Cu (%)	Pb (%)	Zn (%)
1	212	0.106	1.96	1.30	0.78	6.39
3	25	0.04	1.03	1.85	0.04	1.72
4	62	0.06	0.95	1.73	0.37	3.37
	132	0.07	2.65	0.89	1.64	9.50
5	39	0.025	0.34	1.45	0.06	0.34
6	25	0.03	0.73	1.45	0.12	1.08
8	148	0.03	1.10	2.44	0.38	1.69

(Northern Miner, July 18, 1968)

Early in 1969 a winter road was constructed to the property from the Dempster Highway and fuel, equipment and supplies were freighted to the site in preparation for an underground exploration program which began in March, 1969.

BONNET PLUME RIVER AREA

Dolores Creek

MAMMOTH GROUP
Bonnet Plume River Mines Limited
Whitehorse, Yukon Territory.

Copper-Cobalt
(about 64°56.5'N, 133°18'W)

Reference: Findlay (1969, pp. 30-31).

Bonnet Plume River Mines Limited continued surface exploration of its 158-claim Mammoth Group in 1968. The original property, consisting of 108 claims, was staked in 1967 following discovery of a cobalt-copper showing about 15 miles east of Fairchild Lake in an area drained by a west-flowing tributary of Bonnet Plume River known locally as 'Dolores Creek'. The initial showing area, discovered by big game outfitter Louis Brown of Mayo, was explored during the 1967 season, with the result that several additional copper occurrences were located.

Early in 1968 a 50-mile winter tote trail was constructed to link the property with the old Wind River trail, via McLusky Lakes Pass and Gillespie Creek, and equipment and supplies were mobilized from Mayo for the 1968 field program. A base camp was established at the junction of the north fork of 'Dolores Creek' (about 64°55'N, 133°19'W) and a 2,100-foot gravel airstrip was constructed on a right limit bench of the north fork to service the property. Prospecting of the area between the original 'Dolores Creek' showings and Bonnet Plume River resulted in the discovery of additional copper occurrences during the 1968 season. The new showings, located in an area immediately east of a small lake known locally as 'Glacier Lake' (64°54'N, 133°32'W) were covered by a 50-claim block in 1968. The 'Glacier Lake' showing area lies 7 miles west of the 'Dolores Creek' base camp.

Extrapolation of geological data from the Wind and Snake River areas to the north (Norris, Price and Mountjoy, 1963) coupled with geological mapping by company personnel has established that the Fairchild Lake-'Dolores Creek' area is underlain chiefly by Precambrian and (?)Cambrian sedimentary rocks, including shale, slate, phyllite, dolomite, quartzite and iron-formation that contain subordinate volcanic assemblages of varying composition. The sedimentary and volcanic rocks, which probably include parts of units 1 and 2 (Katherine Group) (op. cit.) are cut by numerous small plugs, stocks and dykes of quartz monzonite to diorite. The environment is apparently one of generally anomalously high bedrock copper content and copper occurrences have been noted in a variety of host rocks and geological associations.

The original 'Dolores Creek' property contains three principal showing areas. The initial discovery is a small, irregular massive chalcopyrite replacement zone in buff-weathering dolomite. It is near the mouth of a small, south-flowing tributary ('Discovery Creek') of 'Dolores Creek' north fork, about 1 1/2 miles east of the airstrip. The discovery showing is of minor extent and not of economic interest. The main 'Dolores Creek' showing lies about 1 1/2 miles north-northwest of the discovery zone along the headwall of a west-facing cirque at an elevation of about 5,850 feet. Here, varicoloured (black, green, brown) slates and subphyllites, locally limy, contain stringers and lenses of quartz-siderite carrying disseminated to massive chalcopyrite and in places, cobaltite-chalcopyrite assemblages. The

cobaltite-bearing areas are conspicuous due to pink 'cobalt-bloom' staining of surrounding rocks. The most extensive copper showing in this area occurs as a rusty siderite-chalcopyrite vein lying in a cherty sedimentary horizon. It is exposed over a strike length of about 40 feet and contains massive chalcopyrite in widths up to 12 inches, with disseminated chalcopyrite locally over widths of 3 feet. The vein strikes about N55°W and dips 40 degrees southwest which is the approximate attitude of bedding in the host rocks. In addition to the quartz-siderite-chalcopyrite replacement lenses, slates and phyllitic rocks in this area locally contain fine chalcopyrite disseminated along bedding and cleavage planes.

The third, and probably the most interesting, mineralized zone in the 'Dolores Creek' area occurs in a small acidic intrusion that outcrops on 'Dolores Creek' north fork right limit about 300 feet above the creek and about 3/4 mile east of the camp. In this locality, malachite-stained talus blocks and one small outcrop of intrusive rock contains patchy disseminated chalcopyrite. The rock is potassium-rich and contains about 50 per cent K-feldspar, 25 per cent chloritized hornblende and 10-15 per cent plagioclase with probably minor quartz. As is characteristic of these rocks, accessory magnetite content is relatively high and most samples will affect a hand magnet. Malachite stain is common on fracture surfaces and disseminated chalcopyrite is erratically distributed, probably rarely exceeding 1 to 2 per cent over areas a few feet square.

The 'Glacier Lake' showings discovered in 1968 were not examined by the writer, but according to company personnel, they are generally similar to the 'Dolores Creek' showings. The main occurrence reportedly comprises an area of quartzite and dolomite (unit 1, op. cit.) which has been invaded by numerous basic dykes, and that contains stringers and veinlets of siderite and chalcopyrite. Additional work is planned in this area in 1969.

Bonnet Plume River

SLAB MOUNTAIN COPPER PROSPECT
Cyprus Exploration Corporation Limited
822 - 510 West Hastings Street,
Vancouver 1, British Columbia.

Copper
(64°59.9'N, 133°59.8'W)

The 28-claim Slab Group was investigated briefly by Cyprus Exploration Corporation Limited during the 1968 season. The claims cover a precipitous, copper-stained, southwest-facing mountain slope that borders the north side of Bonnet Plume River valley, about 10 miles west of Fairchild Lake. Because of its conspicuous green-stained appearance from the air, the occurrence has been known for some years but the nature and extent of any previous work on the showing is unknown.

The Slab Mountain occurrence reportedly consists of disseminated chalcopyrite and pyrite in fine-bedded limy and cherty rocks of uncertain derivation. The green staining is due to the presence of malachite; minor cobalt stain and cobalt mineralization are also reported. Although the area of the showing has not yet been geologically mapped, the northwest end of the claim block extends onto the area covered by Geological Survey of Canada, Map 10-1963, Northern Yukon (Norris, Price and Mountjoy, 1963). Rock types shown on this map adjacent to the showing area are lower Paleozoic limestone and dolomite, bounded to the northeast and southwest by Precambrian

phyllitic rocks. The geological setting of this occurrence may in part be similar to that of the Bonnet Plume Mines Limited copper-cobalt prospect east of Fairchild Lake.

HESS RIVER AREA

ATLAS EXPLORATIONS LIMITED
330, 355 Burrard Street,
Vancouver, British Columbia.

General Exploration
105N (Lansing), 105O (Niddery Lake)

Beginning late in the 1967 season and continuing during 1968, Atlas Explorations Limited conducted regional exploration programs (reconnaissance geochemical surveys, prospecting and reconnaissance geological mapping) over an extensive area generally within the drainage basins of Hess and North MacMillan rivers. In the course of this work several claim groups were staked to cover various features of interest, including gossans and geochemical anomalies. In 1968, more detailed follow-up exploration was done on several of the properties.*

On the Tom Group (63°15'N, 131°20'W), consisting of 14 claims located near the headwaters of the North MacMillan River and about 8 miles south-southwest of Niddery Lake, prospecting and mapping was carried out over a gossan zone and nearby geochemically anomalous (copper, zinc) area. The property is reportedly underlain by (?)Ordovician to Devonian sedimentary rocks, including chert, pebble-conglomerate and dolomite.

About 3 miles north-northeast of Niddery Lake, on the north side of Hess River, geological mapping, prospecting, geochemical and geophysical (magnetic, electromagnetic) surveys were conducted over the 24-claim Scot Group (63°20'N, 131°18'W) staked late in 1967 on the basis of reconnaissance geochemical work. The geology of the area is apparently similar to that of the Tom Group farther southwest, with (?)Ordovician to Devonian sediments (chert, shale, quartzite, phyllite) present.

About 14 miles east of Swan Lake the 4-claim Bob Group (63°35'N, 132°25'W) was geologically mapped and prospected in a follow-up program to investigate gossan areas which led to staking of the property late in 1967. Anomalous zinc geochemical values were recorded near the gossans and the oxidized material contains minor pyrite. The property is reportedly underlain by black slate and chert-pebble conglomerate, possibly of Ordovician to Devonian age.

DAWSON MINING DISTRICT

FORTYMILE AREA

CLINTON MINE
Cassiar Asbestos Corporation Limited
85 Richmond Street,
Toronto, Ontario.

Asbestos
(64°27'N, 140°42'W)

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* The properties were not visited by the writer and the information contained here was obtained from company reports and is published by permission of Atlas Explorations Limited.

References: Green and Roddick (1962); Green and Godwin (1964, pp. 19-21); Green (1965, pp. 25-27; 1966, pp. 25-26); Christian (1966); Findlay (1967, pp. 27-28; 1969, pp. 31-32).

The Clinton Mine completed its first full year of production in 1968 and became the leading revenue-producing operation in Yukon with a value of product sales reaching about 10.2 million dollars. The open pit asbestos mine, located about 48 miles west of Dawson surpassed its initial production target of 60,000 tons of fibre (mainly Canadian Group 4 category) in 1968 and this will be increased to about 70,000 tons in 1969 and about 80,000 tons by 1970-71.

The Clinton Mine is reached by a 26-mile access road that leaves the Sixtymile-Boundary road near Mile 33 and crosses Fortymile River via a bridge near the mouth of Clinton Creek. The townsite for the mine, expected to have an ultimate population of 600 to 700 is on a bench above the north bank of Fortymile River, about 5 miles from the mine. During 1968 the bulk of townsite construction work was completed, and transfer of staff from temporary housing at the millsite took place in the fall of 1968. Late in the year, the mine had a payroll of about 280 persons.

The Clinton deposit was discovered in 1957 and initially explored in 1957 and 1958. Following development work in 1963 and 1964 a production decision was announced in 1965. The mine and primary crushers are located at an elevation of about 1,600 feet on Porcupine Hill, immediately south of Clinton Creek. The mill complex is on Trace Hill across Clinton Creek valley to the north, and ore is transported from the crusher to the mill via a mile-long aerial tramline with a capacity of about 300 tons per hour. During the latter part of 1968 mining was carried out at a rate of about 5,000 tons per day and mill input was about 3,000 tons per day to produce about 250 tons of fibre per day. The fibre is packaged and transported by truck convoy (10 trucks per day) to Whitehorse for transhipment to Vancouver via Skagway by the White Pass and Yukon Railway and ship system.

The initial bench of the Clinton Mine open pit was established at an elevation of 1,710 feet. Since the start of production in October, 1967, mining from 30-foot benches had reduced the pit floor to an elevation of about 1,560 late in 1968. As mining progresses, the open pit will be expanded upslope to the west to a maximum planned elevation of the upper bench of 1,850 feet.

The following summary of operating results for 1968 is from information provided by the company:

	1967[1]	1968
Tons milled	35,316	744,067
Daily average, tons	706	2,505
Fibre (%) (Recovery)	7.25	8.64
Fibre production:		
Canadian Group 4 (tons)	1,684	50,617
Other	876	13,662
Fibre sales[2]	$500,000	$10.2 million

[1] For two month period; production commenced October, 1967.
[2] Without deductions for transportation and marketing costs.

The Clinton asbestos orebody lies within a lensoid serpentinite body about 4,500 feet long and up to 1,000 feet wide. The intrusion is one of several ultramafic bodies in the area that have been emplaced in a mixed volcanic and sedimentary assemblage of uncertain age that includes argillite, quartz-sericite-muscovite schist, carbonaceous limestone and chloritic schist derived from volcanic rocks. The ultramafic lens and its contained asbestos deposit strike about west and dip moderately north. A fairly typical section, from north to south across the body in the vicinity of the ore zone comprises the following: argillite; hanging-wall contact of the intrusion, which dips about 50 degrees north; marginal quartz-carbonate alteration zone, averaging 60-70 feet thick; a dislocation zone up to 20 feet thick composed of 'gougy' quartz-carbonate material; a zone of barren serpentinite of varying thickness (in places, absent); serpentinite carrying asbestos (ore zone); and, footwall contact (dipping about 30 degrees north) between serpentinite and a rock locally termed 'quartzite'.

SIXTYMILE AREA

Mosquito Creek

CONNAUGHT MINES LIMITED
Box 3854, Stn. D,
Edmonton, Alberta.

Silver-Lead
(63°55'N, 140°48'W)

References: Cockfield (1921); Green (1966, p. 28); Findlay (1967, p. 29; 1969, pp. 32-33).

Formerly called the 'CCL Group' and owned by Sixtymile Mining Company Limited, this property was acquired by the present company early in 1968. The property consists of a total of 116 claims located about 7 miles south of Glacier Creek P.O. (abandoned) and about 3 miles south of the junction of Sixtymile River and Mosquito Creek, a north-flowing tributary of the river. The original (CCL) claims covered two main showings about 2 miles apart. The upper (No. 1) occurrence lies at an elevation of about 4,500 feet and consists of a northeast-trending, steep-dipping vein cutting quartz-feldspar gneiss and carrying massive galena over widths up to 18 inches. The lower showing (No. 3) lies at an elevation of about 3,500 feet and consists of a lens of massive galena up to 3 feet in width with minor chalcocite in a shear structure cutting quartz-feldspar gneiss. About midway between the upper and lower showings, a third zone (No. 2) of unknown extent is present.

In past years the showings have been investigated through blasting and bulldozer trenching and in 1966 Sixtymile Mining Company mined a total of about 25 tons of high-grade ore from the No. 1 and No. 3 showings and shipped it to the Cominco smelter at Trail, British Columbia. The material reportedly contained 67 ounces per ton silver and 67 per cent lead.

In 1968, the present company increased its holdings from the original 60-claim group to a total of 116 claims. A temporary access trail, in part navigable only by tracked vehicle, was established from Sixtymile River to the property. Reconnaissance geochemical surveys were carried out over parts of the property and additional bulldozer trenching was done on the showings. Late in the season diamond drilling of the lower showing was attempted but bad weather caused termination of the operation before completion of the first hole. Further work is planned on the property in 1969.

KLONDIKE AREA

King Solomon Dome

OREKON SYNDICATE
Dawson, Yukon Territory.

Gold-Silver
(64°52.5'N, 138°56.5'W)

References: Bostock (1942); MacLean (1914).

The Orekon Syndicate, composed principally of American participants with some local (Dawson) representation, holds 25 claims on the northeast flank of King Solomon Dome, west of the Hunker Creek road. The property is reached from the Sulphur Creek road about 1 1/2 miles west of its junction with the Dominion Creek road on Hunker Summit.

King Solomon Dome is underlain by quartz-sericite schists (Klondike schists; unit B, Bostock, 1942) that are cut by numerous massive quartz veins and lenses ranging from a few inches to 5 to 6 feet in width. Through the years there has been recurrent speculation that a legendary 'Mother Lode' of the Klondike placer gold fields might be found in such a geological environment; in spite of the paucity of lode gold occurrence discovered in the Klondike area since the turn of the century and in the face of the more generally favoured thesis that the placers formed as a result of mechanical concentration of minute quantities of gold originally widely distributed in the Klondike schists and their contained quartz veins and lenses. Notwithstanding this, the search for lode gold deposits in the Klondike area has continued sporadically and several showings were worked in the early 1900s, the best known of which was the Lone Star Mine on Victoria Gulch, a tributary of Upper Bonanza Creek (MacLean, 1914, pp. 21-37).

King Solomon Dome (or 'The Dome' as it was called in the early days) has traditionally been a favoured prospecting area for lode gold deposits because of its prominent position as the highest point in the Klondike area and because the major placer-gold producing creeks - Hunker, Dominion, Sulphur, Bonanza, Eldorado and Quartz - fan out from its flanks. The present property, located on the ridge between the headwaters of Gold Bottom Creek and the right fork of Hunker Creek was probably originally partly included in the 'Mitchell Claim Group' described by MacLean (1914, pp. 91-95). The property contains a water-filled shaft sunk on a quartz vein, reportedly to a depth of 84 feet. In the mid-1940s the Yukon Consolidated Gold Corporation reportedly cleaned out the old shaft and carried out some surface exploration on the property. Results were apparently not encouraging.

The present syndicate began reinvestigation of the property in 1965. Initially, work was confined mainly to a quartz-vein exposure about 3,000 feet south of the old Mitchell shaft. In this area the quartz vein, which strikes N10°W, dips about 70 degrees east and ranges up to 3 1/2 feet in width, carries a thin (2-3 inch) massive galena-chalcopyrite seam. A 1,800-pound sample of the sulphide material was reportedly hand-picked and shipped to Tacoma, Washington for smelter-testing. The sample reportedly assayed: 305 ounces per ton silver, 23.5 per cent lead and 2.9 per cent copper.

Encouraged by the assays returned from the initial showing, the syndicate embarked on an extensive program of bulldozer trenching in 1967 and 1968. The work was concentrated mainly on the northeast part of the property along the slope above the headwaters of Hunker Creek right fork. A series of long subparallel bulldozer cuts exposed numerous massive quartz

veins, most striking N10°W to N10°E, dipping steeply east and ranging in width from a few inches to 6 feet. Sulphide mineralization is sparse, but a few veins carry erratically-distributed galena with some pyrite. Two grab samples collected at random from separate veins carrying patchy galena from the lower trench (northeasternmost) assayed*: 0.01 ounce per ton gold; 29.8 ounces per ton silver; 28.1 per cent lead; and, 0.02 ounce per ton gold; 110.8 ounces per ton silver; 20.6 per cent lead; 0.06 per cent zinc. A chip sample taken across 3 feet of disseminated galena-bearing quartz vein material from the upper trench about 200 feet north of the Sulphur Creek road assayed*: 0.005 ounce per ton gold; 1.48 ounces per ton silver; 2.7 per cent lead.

Haystack Mountain

MAC CLAIMS
Cominco Limited
Trail, British Columbia.

Gold
(63°42'N, 139°07'W)

References: Bostock (1942); MacLean (1914).

Cominco Limited holds 16 claims covering the old McKinnon Creek auriferous conglomerate showing on the northeast flank of Haystack Mountain about 3 miles south of Indian River. According to Bostock (1942) the area is underlain by Eocene quartz-pebble conglomerate (unit 3, op. cit.) partly capped by andesitic volcanic rocks of the Carmacks Group (unit 4, op. cit.). On McKinnon Creek Bostock reported (op. cit.) that over 500 feet of Eocene material, chiefly conglomerate is present.

Low gold values in the McKinnon Creek (MacKinnon according to the original spelling - see MacLean, 1914, p. 62) Eocene conglomerates were recognized near the turn of the century and between about 1904 and 1912 intermittent exploration by means of shafts and short tunnels was carried out on several claims, chiefly the Britannia and Thistle. Since that time the occurrence has been re-examined sporadically by companies and individuals but little work has been done.

During the 1968 season the present company conducted reconnaissance geological mapping in the vicinity of the occurrence to determine the extent and distribution of the auriferous horizon.

WHITEHORSE MINING DISTRICT

DAWSON RANGE AREA

Freegold Mountain

P. F. GUDER
Carmacks, Yukon Territory.

Gold-Silver-Lead
(about 62°17'N, 137°10'W)

References: Bostock (1936a, pp. 52-53); Findlay (1969, p. 35).

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* Assayed by G. Spalding, Whitehorse, Yukon Territory.

Prospector P.F. Guder, the original discoverer of gold on Freegold Mountain in 1930, continued hand-prospecting of several claims in the Seymour Creek-Freegold area in 1968.

On a 27-claim property straddling Cabin Gulch and covering the southwest flank and northwest summit of Freegold Mountain (62°17.5'N, 137°08'W) Guder has done considerable hand-trenching and hand-shafting in past years to investigate silicified gold-bearing Tertiary(?) quartz porphyry dykes (unit 13, Bostock, 1936a) and quartz veins cutting Coast Intrusion granitic rocks (unit 10, op. cit.). On the northwest part of this property, above the headwaters of Kitchener Creek Guder has also investigated a small silver-lead showing ('Red Fox' showing) consisting of a vein structure cutting Yukon Group quartz-biotite-schist (unit 1, op. cit.) and carrying massive galena over widths up to 1-1.5 feet. A grab sample of massive galena collected by this writer from the dump at the mouth of a small open-cut on the vein assayed*: 130.00 ounces per ton silver; 61.95 per cent lead; 0.03 per cent zinc.

Guder also holds the old Caribou Creek gold property (62°15.2'N, 137°11'W) located about 2 miles up Caribou Creek from its junction with Seymour Creek. The showing is about 500 feet from the creek on the west slope of the valley. It consists of a complex zone of intrusive rocks, including granodiorite, feldspar porphyry and various dyke rocks, that contains a large zenolith(?) of peculiar-looking material that has been given various names, ranging from 'dacite-porphyry' to 'greywacke'. The rock is composed of subangular quartz and feldspar fragments in a dark, fine-grained gritty matrix that is locally graphitic. It has been strongly brecciated and contains numerous white quartz veinlets and stockworks, many of which are vuggy or druzy. Gold occurs in the stockwork veins, but no other metallic minerals are present. The extent of the original gold-bearing zone is difficult to evaluate because of the presence of talus and slump material from the bank above, but it was apparently relatively narrow (10-15 feet) and localized along a shear zone that strikes about N60°W. A grab sample of stockwork vein material collected by this writer assayed*: trace gold; 0.12 ounce per ton silver.

About 800 feet up the creek from the showing area are the remains of a log building that formerly contained a 7-ton ball mill used for a brief period in the 1930s.

Nansen Creek

MOUNT NANSEN MINES LIMITED
BROWN McDADE MINES LIMITED
420 - 475 Howe Street,
Vancouver, British Columbia.

Silver-Gold
(about 60°03'N, 137°07'W to 137°10'W)

References: Bostock (1936a); Green and Godwin (1963, pp. 23-24; 1964, pp. 26-28); Green (1965, pp. 32-34; 1966, pp. 34-38); Campbell (1965; 1966); Findlay (1967, pp. 30-31; 1969, pp. 35-38).

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* Assayed by G. Spalding, Whitehorse, Yukon Territory.

Mount Nansen Mines Limited commenced production from its Heustis silver-gold property in September, 1968. Initially, the 400-ton capacity mill was operating intermittently at about 200 tons per day but this was expected to be increased following completion of the tune-up period early in 1969. Recovery from the mill is expected to be increased through the addition of a cyanide circuit, currently being planned.

The Mount Nansen properties, including the Webber and Heustis, and the adjacent property of affiliated Brown McDade Mines Limited, have been explored intermittently since 1962. For the past three years underground development work has been carried out on the properties, principally the Webber and Heustis with the exception of the period April, 1966 to June, 1967 when work was suspended pending financial arrangements to bring the properties into production. The properties have had a complicated ownership history. Currently, Peso Silver Mines Limited holds a 51.7 per cent interest in Mount Nansen Mines Limited. Peso is in turn controlled by Moneta Porcupine Mines, Limited and Charter Oil Company Limited. Brown McDade is controlled by Peso Silver Mines Limited and Charter Oil Company Limited.

The Mount Nansen and Brown McDade properties comprise a total of 369 claims located about 150 miles northwest of Whitehorse and about 30 air miles west of Carmacks. Access to the properties is by a 40-mile gravel road completed in 1968 that leaves the Carmacks-Laforma road about 1 mile west of Nordenskiold River bridge at Carmacks.

The three principal vein systems - Heustis, Webber, and Brown McDade - have been explored by underground work; a fourth vein, the Cabin Creek has been investigated by trenching and drilling. The vein structures consist of sulphide-bearing quartz lenses, veins and stockworks cutting highly-altered quartz-feldspar porphyry (unit 13, Bostock, 1936a) and Yukon Group quartz-biotite schists and gneisses (unit 1, op. cit.). The principal metallic minerals are arsenopyrite, pyrite, galena and sphalerite. Various silver-bearing minerals, including freieslebenite, acanthite, native silver, andosite and argentiferous tetrahedrite have been identified in the ores (Green, 1966, p. 36).

Most development work has been concentrated on the Webber and Heustis properties; specifically from the Heustis 4100 and 4300 adits and the Webber 4300. During 1968 a fourth adit, the Webber 4100, was driven from a location on the south side of Webber Creek, about 1,500 feet west of the Webber 4300 level portal. A total of about 10,000 feet of drifting and crosscutting and raising has been completed from these four adits. Of this total, about 3,000 feet was completed in 1968. It is expected that some ore will be taken from the Brown McDade adit in 1969. Initial mining is being done from the Heustis 4300 and 4100 levels and it is planned to sink an internal shaft to gain access to deeper ore below the Heustis 4100 level (Peso Silver Mines Limited, Annual Report, 1968). As a result of the 1968 development work, ore reserves in the Heustis-Webber systems were stated to be 330,000 tons averaging 0.5 ounce per ton gold and 18.4 ounces per ton silver (op. cit.).

The following summary of operating results for 1968[1] is from information provided by the company:

	1968[1]
Dry tons milled	6,819
Daily average, tons	69.0
Concentrate (tons)	636.6
Mill heads:	
Gold (oz/ton)	0.23
Silver (oz/ton)	4.76
Lead (%)	8.00
Metal production:	
Gold (oz)	1,006.1
Silver (oz)	19,309.2
Metal sales[2]:	
Gold	23,000
Silver	34,200
Lead	6,200
Total sales	63,400
Ore reserves[3]:	
Tons	177,125
Gold (oz/ton)	0.45
Silver (oz/ton)	16.6

1 For production period September-December, 1968.
2 Excluding smelting, transportation and marketing charges.
3 Excludes 127,270 tons of possible ore grading 16.6 ounces per ton silver and 0.45 ounce per ton gold.

Mount Nansen

MAY GROUP
Esansee Explorations Limited
Box 2497,
Whitehorse, Yukon Territory.

Silver-Gold
(62°07'N, 137°15'W)

Reference: Bostock (1936a).

Esansee Explorations Limited holds 37 claims centred about 2 miles northeast of Mount Nansen summit and accessible by a tote trail which originates at the Mount Nansen Mines Limited property to the southeast.

The geology of the property area is similar to that of the Mount Nansen Mines Limited property and Bostock (1936a) shows Coast Range granodioritic rocks (unit 10) cut by numerous Tertiary(?) rhyolite and quartz porphyry dykes.

Ground geophysical surveys carried out by the company outlined several anomalous areas, some of which were coincident with geochemical anomalies (mainly Pb). Subsequent follow-up bulldozer trenching reportedly exposed a vein structure carrying galena with gold and silver values. The property was not visited in 1968.

Big Creek

YUKON REVENUE MINES LIMITED
Box 2029, Industrial Road,
Whitehorse, Yukon Territory.

Copper
(62° 20'N, 137° 17'W)

References: Bostock (1936a); Green and Godwin (1964, p. 29); Green (1966, pp. 31-33); Findlay (1969, pp. 38-39).

Yukon Revenue Mines Limited holds a total of 114 claims covering the old Revenue Creek copper showing located on upper Revenue Creek about 1 1/2 miles above its junction with Big Creek. The original showing was discovered by P.F. Guder in the early 1950s, and a short prospect adit was driven into the discovery outcrop at that time. In subsequent years the property has been intermittently investigated by various companies and individuals, including Teck Exploration Company Limited (1954, 1955) and Canex Aerial Exploration Limited (1964, 1965) and G. Heitman and E. Whitehead (1966-67). Previous work consisted principally of geophysical and geochemical surveys and 10 diamond-drill holes totalling about 2,284 feet.

During the winter of 1966-67 Heitman and Whitehead obtained a working option on the property from P.F. Guder and did limited open-cutting near the original prospect adit. Results were disappointing and the operation was terminated in February, 1967. Later that year, General Enterprises Limited of Whitehorse optioned 15 claims from Guder and constructed a new access road from Seymour Creek to the property, a distance of about 8 miles. Some bulldozer trenching was carried out late in the 1967 season and in early 1968 the present company was formed to conduct more extensive investigations on the property.

During the 1968 season, Yukon Revenue Mines Limited did additional staking, road construction, geochemical soil sampling and extensive bulldozer trenching in the vicinity of the main showing. In addition, an airstrip was constructed along Big Creek flats near the mouth of Revenue Creek. Following I.P. surveys a diamond drilling program was started late in the season and by the end of the year 4 holes totalling about 2,000 feet had been completed. Additional drilling is planned in 1969.

In the original Revenue Creek showing, chalcopyrite with minor pyrite occurs in disseminated to massive lenses in highly altered and brecciated quartz-feldspar porphyry, locally rhyolitic in appearance (unit 13, Bostock, 1936a). Recent work by the present company suggests the possibility that the original showing is not in place but may represent a buried slump-block carried down from farther upslope (south). The geology of the showing area is complex and apparently several ages or stages of intrusive activity are represented*. The general picture is that the mineralized zone lies in a complex of altered and brecciated hybrid rocks that occur between Coast Range granodiorite (unit 10, op. cit.) exposed uphill to the south of the showing and quartz-feldspar porphyry exposed to the north near the junction of Revenue Creek and its west fork, locally referred to as 'Whirlwind Creek'. In addition to the discovery showing, several new oxidized zones carrying copper mineralization have been exposed by a series of en echelon bulldozer trenches cut along the right limit valley of Revenue Creek. These occurrences, as well as a geochemically anomalous area near Whirlwind Creek are being further investigated by drilling and additional trenching.

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* Personal communication, R.A. Granger.

Casino Creek

CASINO SILVER MINES LIMITED
401, 1111 W. Hastings Street,
Vancouver, British Columbia.

Silver-Lead
(62°43'N, 138°49'W)

References: Cockfield (1928b, pp. 11A-13A; in Bostock, 1957, pp. 576-578); Green and Godwin (1964, pp. 22-24); Green (1965, pp. 34-35; 1966, pp. 39-42); Findlay (1967, pp. 32-34; 1969, pp. 39-40).

Casino Silver Mines Limited holds 166 claims near the headwaters of Canadian and Casino creeks, about 70 miles northeast of Snag Junction and about 190 miles northwest of Whitehorse. In 1965-66 a 140-mile winter access road was constructed from Burwash Landing on the Alaska Highway to the property; however recent exploration has been carried out using a gravel airstrip on the property for access.

The Canadian-Casino Creek area was first explored for placer gold-tungsten deposits, discovered in 1911 on Patton Creek, on the northern part of the present property. Silver-lead veins were discovered in the area in about 1936 but were not seriously investigated until about 1963. In 1965 the present company was formed; until 1967 it was owned by L. Proctor and associates of Whitehorse. Early in 1968 control of the company was acquired by the Brynelsen Group of Vancouver.

Since 1965 Casino Silver Mines Limited has investigated silver-lead occurrences on the Casino-Canadian Creek property through underground work, diamond drilling, bulldozer trenching and various surface exploration programs. The silver-lead veins carry quartz, carbonate (barite and siderite) galena, sphalerite and subordinate pyrite and chalcopyrite. They occur in shear zones in altered granodiorite of Cretaceous age*. The two principal vein systems are the Bomber and the Helicopter. The Bomber showing contains four principal veins that have been explored through surface trenching and by a total of 1,200 feet of underground drifting carried out from an adit located at an elevation of about 3,940 feet. During the course of trenching carried out in 1965 a total of 48.42 tons of ore averaging 161.1 ounces per ton silver and 68.0 per cent lead was hand-sorted from the Bomber veins and shipped out for smelter testing. The Helicopter showing lies 3,400 feet west of the Bomber and consists of a prominent shear zone in granodiorite that has been traced by trenching and electromagnetic surveys for a total distance of 4,600 feet. Bulldozer trenching has exposed minor sulphide mineralization, chiefly at the northern end of the structure.

In the 1967 and 1968 seasons, exploration efforts were shifted from the known silver-lead showings to an area in the northern part of the property near the headwaters of Casino Creek. Here a geochemical survey conducted in 1966 had outlined interesting anomalous areas, including a strong copper-zinc anomaly along a small tributary to upper Casino Creek. This

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* The granodiorite is probably part of the Cretaceous Coast Intrusion sequence. Potassium-argon age determination carried out on biotite and hornblende from a drill core sample of fresh granodiorite from the Bomber showing area yielded ages of 95 m.y. and 99 m.y. respectively. The age determinations were made in 1968 by the Geochronology Laboratories of the Geological Survey of Canada.

creek contains a pronounced rusty gossan zone which was tested by diamond drilling in 1967. The drilling indicated that the gossan material was probably transported from a site farther upstream. Accordingly, geochemical surveys were carried out in 1968 over the upland area (Patton Hill) above the geochemically-active tributary stream. The survey outlined a pronounced copper-molybdenum anomaly centred approximately over Patton Hill. Further work is planned in this area for 1969.

AISHIHIK AREA

Aishihik Road

AD CLAIMS
Mitsubishi Metal Mining Company Limited — Copper-Molybdenum
1401 - 900 West Hastings Street, — (61°17'N, 136°54'W)
Vancouver 1, British Columbia.

Reference: Cairnes (1909; in Bostock, 1957, pp. 281-282).

During 1968 Mitsubishi Metal Mining Company Limited carried out airborne geophysical surveys, soil sampling surveys and detailed geological and prospecting programs on its 64-claim AD group. The claims are located immediately east of Mile 31-32 on the Aishihik Road above the east shore of Hopkins Lake*. They cover an area in which small copper occurrences have long been known, some of which were described by Cairnes (1909; in Bostock, 1957, pp. 281-282)*. The original occurrences were described as narrow quartz-bearing mineralized lenses carrying magnetite, chalcopyrite and malachite formed along the contact between granite and limestone. Most of the mineralized lenses were noted to be narrow (3-10 feet) but one was apparently 20 feet wide. Strike length rarely exceeds 100-200 feet.

The 1968 work by the present company located a number of small contact-metasomatic copper-iron occurrences along the contact between Coast Range granodioritic rocks and limestone bands contained within Yukon Group schists and gneisses. In addition, locally disseminated molybdenite was found in the granodioritic rocks, and in places quartz-carbonate-chalcopyrite mineralization was found along and near the contact between granodiorite and Yukon Group rocks. Additional work is planned in the area.

GLENLYON RANGE AREA

Detour Lakes

GLENLYON MINES LIMITED — Copper-Zinc
Box 3012, — (about 62°40'N, 134°15'W)
Whitehorse, Yukon Territory.

* In the Cairnes report they are described as the 'Giltana Lake Claims'. The confusion here stems from the fact that Hopkins Lake and Giltana Lake became transposed on the National Topographic Series 4-mile Aishihik Lake Map (115H). Giltana Lake is actually the northernmost of the two lakes (Hopkins and Giltana) although it is shown as the southern one on the map.

References: Campbell (1967); Findlay (1967, pp. 34-35; 1969, p. 42).

Glenlyon Mines Limited holds 318 claims in several groups in the Detour Lakes area, about 85 miles northwest of Ross River. The area lies in Tintina Valley and is partly underlain by rocks formerly considered Mississippian (unit 15; Campbell, 1967) but that are probably in part correlative with similar rocks of adjacent Tay River map-area, now believed to be Cambrian (Tempelman-Kluit, 1968).

Staking and initial exploration of the Detour Lakes area was based on reported copper (chalcopyrite) float discoveries spurred by discovery of the lead-zinc deposits of the Anvil district in adjacent Tay River area. During 1966 and 1967 airborne geophysical surveys, ground geophysical and geochemical surveys, geological mapping and prospecting, and limited bulldozer trenching were carried out on the property, with particular emphasis being placed on exploration of the Hub and Pine group claims. The surface exploration outlined a number of geophysical and geochemical anomalies as well as minor quartz-chalcopyrite mineralization exposed on a third claim group the J.H. The latter claims are on the east side of Pelly River.

In the spring of 1968 Glenlyon Mines Limited entered into an option agreement with McIntyre Porcupine Mines Limited and during the 1968 field season the latter company carried out a preliminary diamond drilling program on the property. Five holes were drilled ranging in depth from about 300 feet to 684 feet and totalling 2,564 feet. Drill targets on the Pine (1 hole), Hub (1 hole) and Mab (2 holes) claim groups were selected on the basis of geochemical and/or geophysical anomalies. In additon, one hole was drilled to test the surface mineralization on the J.H. group. No significant sulphide mineralization was encountered in the drilling, but one hole (Mab group) reportedly cut about 100 feet of low grade hematite 'iron-formation'.

ANVIL RANGE AREA

Rose Creek

FARO MINE
Anvil Mining Corporation Limited
Box 2470,
Whitehorse, Yukon Territory.

and

523 West 6th Street,
Los Angeles, California.

Lead-Zinc
(61°21.5'N, 133°02'W)

References: Chisholm (1957, pp. 269-277); Roddick and Green (1961a); Green and Godwin (1964, pp. 31-32); Green (1965, pp. 36-37; 1966, pp. 47-50); Aho (1966, pp. 127-149); Roddick (1967); Findlay (1967, pp. 35-39; 1969, pp. 43-45); Tempelman-Kluit (1968, pp. 48-52).

Preproduction work on the Faro open-pit lead-zinc deposit continued in 1968 and partial production is scheduled for September, 1969. The Faro property, located near Rose Creek in Anvil Range about 45 miles

northwest of Ross River and 130 air miles northeast of Whitehorse, is now accessible from the Whitehorse-Mayo road by means of the Carmacks-Little Salmon Lake-Ross River road completed late in 1968. Distance from Carmacks to the mine is 125 miles by road.

The Faro deposit was discovered during the 1965 field season as the successful result of an exploration program carried out under a joint venture agreement between Cyprus Mines Corporation and Dynasty Explorations Limited. The new discovery was located approximately 8 miles west of the original Vangorda Creek lead-zinc discovery of Vangorda Mines Limited (later absorbed by Kerr-Addison Mines Limited). Subsequently Anvil Mining Corporation Limited was formed by Dynasty Explorations Limited (40 per cent) and Cyprus Mines Corporation (60 per cent) to develop the Faro prospect. A production decision was announced in 1967.

The Faro orebody contains published reserves of 63,472,940 tons with average grades of 3.405 per cent lead, 5.721 per cent zinc, and about 1.2 ounces of silver per ton. The ore comprises massive pyrite-pyrrhotite-galena-sphalerite assemblages occurring in three principal zones along a total strike length of about 4,000 feet. The main zone (Faro No. 1) is a northwest-striking, shallowly southwest-dipping, lens about 2,400 feet long by 1,200 feet wide. The orebody is gently sinuous in longitudinal sections and plunges range from 35 degrees to the southeast to nearly horizontal. The ore suboutcrops locally and the main zones were overlain by 10 to 30 feet of overburden and glacial debris and up to 250 feet of cap rock. The ores occur within laminated phyllitic rocks originally thought to be Mississippian in age (Roddick and Green, 1961a) but now believed to be Cambrian (Tempelman-Kluit, 1968). These 'unit 3' rocks have been divided into two assemblages by Tempelman-Kluit (1969); a 'lower' quartz-rich phyllite member 1,000 feet thick and an 'upper' member about 3,000 feet thick that is characterized by non-quartzose phyllite and thick greenstone lenses. The known sulphide deposits of the region occur in the 'lower' member of unit 3.

Work during 1968 was concentrated in three main areas - open pit preparation, mill erection, and townsite and auxiliary services construction. The open pit outline has been established and stripping of quartz-sericite phyllite cap rock to the top of the ore zone is partly completed. Late in 1968 stripping around ore was being done on the 4,275 and 4,240 benches. The top bench of the pit was at an elevation of 4,345 feet and the planned pit bottom will be at an elevation of 3,575 feet. By late 1968 the mill buildings had been erected and sheeted in and the installation of mill machinery was in progress. Designed mill capacity is 5,500 tons per day with an annual production of 240,000 tons of zinc concentrate (estimated at 54 per cent zinc) and 130,000 tons of lead concentrate (estimated at 69 per cent lead) scheduled. Work on the townsite ('Faro') and townsite access road systems continued and installation of sewer and water systems was 40 per cent complete in late 1968. The townsite, located near Vangorda Creek and about 12 miles from the mine is being designed for an eventual population of 1,000 to 1,500.

In addition to work on the Faro property, Anvil Mining Corporation continued exploration on other of its holdings in the area in 1968. On the Sea Group (about 62°12'N, 133°02'W) diamond drilling totalling 1,500 feet in 2 holes was carved out to test gravity anomalies. Elsewhere in the region, surface exploration, principally gravity surveys, was conducted on several other claim groups.

Caribou Lake

NORTHERN EMPIRE MINES LIMITED
705 - 850 West Hastings Street,
Vancouver 1, British Columbia.

Copper-Zinc
(62°34'N, 133°22.5'W)

Reference: Findlay (1969, p. 48).

Northern Empire Mines Limited holds 56 claims lying along the south side of Tay River valley and north and east of a small lake known locally as 'Caribou Lake'. The property is about 56 miles northwest of Ross River and 16 miles north of Anvil Mining Corporation's Faro deposit.

The initial work on this property was done in 1966 by Yukon Copper Limited which conducted airborne geophysical surveys, geological mapping, and reconnaissance geochemical surveys. In 1967, the present company carried out geological and geochemical surveys over parts of the property and investigated geochemical anomalies by bulldozer stripping and trenching. The bulldozer work exposed disseminated copper-zinc mineralization and in 1968 additional stripping was carried out on the original showing and nearby. This work uncovered additional mineralization which is to be further investigated in 1969.

The property is underlain chiefly by Devonian or Lower Mississippian(?) quartzite, chert, and cherty argillite (unit 5b, Roddick and Green, 1961a). In the vicinity of the showings the rocks are cherty and intensely fractured. Mineralization occurs as disseminated pyrrhotite with minor chalcopyrite and sphalerite in irregular rusty-oxidized patches in the highly-fractured cherty rocks. Grab sample assays from the original showing area reportedly ranged from 2.8 to 4.5 per cent zinc, 0.04 to 0.18 per cent copper and 0.18 to 0.32 ounce per ton silver (Yukon Daily News, April 4, 1967).

The property was visited in mid-July, 1968 at which time a crew of three men was engaged in bulldozer stripping to investigate additional geochemical anomalies within 1/4 mile of the initial showing. Some mineralization had been exposed but it was of subeconomic grade. Subsequent to the writer's visit a new showing was reportedly discovered containing better copper-zinc mineralization.

SOUTH MacMILLAN RIVER AREA

Mount Selous

LAD CLAIMS
Atlas Explorations Limited
330 - 355 Burrard Street,
Vancouver, British Columbia.

Copper-Lead-Zinc
(62°56'N, 132°14'W)

Reference: Roddick and Green (1961a).

Atlas Explorations Limited holds 208 claims located about 8 miles east of Mount Selous and about 65 miles north of Ross River. The original Lad claims were staked late in the 1967 field season following discovery of three mineralized showings (copper, lead, zinc and silver), a number of

sulphide float occurrences, and anomalous geochemical values obtained from reconnaissance soil sampling. During 1968, additional claims were staked adjacent to the original Lad Group.

The area is underlain chiefly by Proterozoic sedimentary rocks (quartzite, phyllite, shale) (unit 1, Roddick and Green, 1961a) and chert, shale and chert-pebble conglomerate of Ordovician and Silurian age (unit 3, op. cit.). A number of sulphide showings, consisting of galena, sphalerite, pyrite, pyrrhotite and chalcopyrite reportedly occur in shear zones cutting the Proterozoic rocks.

During the 1968 season the company carried out geological mapping, geochemical surveys, ground and airborne electromagnetic and magnetic surveys and some hand trenching and sampling on the claims. A number of geochemical and geophysical anomalies were outlined that will be further investigated by bulldozer trenching in 1969. The property was not visited in 1968.

WHITEHORSE AREA

Whitehorse Copper Belt

NEW IMPERIAL MINES LIMITED
1633 - 355 Burrard Street,
Vancouver, British Columbia.

Copper-Silver-Gold
(60° 33'N to 60° 45'N,
134° 53'W to 135° 10'W)

References: Green (1965, pp. 33-39; 1966, pp. 50-51); Findlay (1967, pp. 41-43; 1969, pp. 49-54); Hilker (1967).

New Imperial Mines Limited completed the first full year's production from its Copper Belt operations in 1968, with an output of over 12 million pounds of copper for the year. Most production came from the Little Chief open-pit mine, about 2 miles east of MacRae (Mile 911, Alaska Highway) but from about July 1 to year-end, mining was also carried out from the Arctic Chief East and West open pits, about 3 miles northwest of the Little Chief Mine. At current rates of production mining from the Little Chief open-pit should be completed in about March of 1969, at which time the bottom of the pit will be 335 feet below the original surface. The smaller Arctic Chief pits (containing an estimated 243,000 tons of ore grading about 1.20 per cent copper) will be bottomed out at about the same time as the Little Chief pit is completed, in preparation for production from the War Eagle property, the third of the company's deposits to be brought into production. Early in 1969, surface work to prepare the War Eagle deposit (about 1.2 million tons grading about 1.29 per cent copper) for production was begun, including the completion of a 10-mile access road from the Little Chief that was begun in 1968. The War Eagle is scheduled to begin production in May, 1969.

New Imperial Mines Limited has developed its Copper Belt open-pit operations in partnership with Sumitomo Metal Mining Company of Japan which has provided part of the development capital and which will purchase all copper concentrate for a minimum 10-year period, beginning May, 1967. The 2,500-ton mill, located at the Little Chief Mine, is designed to treat ores from the other properties in the Copper Belt as they are successively brought into production. Mill concentrates are transported by rail and ship to Vancouver via Skagway, Alaska and thence trans-shipped on ocean carriers to Japanese

smelters. Currently (early 1969) 169 persons are employed in the operations of the company. At the Little Chief property, in addition to the approximately 1.1 million tons of open-pit ore now nearly mined out, a systematic deep drilling program has blocked out a significant deep orebody containing calculated reserves of 5 million tons grading about 2 per cent copper. Although not completely delineated, the available data indicate that the deep orebody is roughly tabular, strikes about north, and dips about 55 degrees east. A feasibility study completed in 1968 concluded in favour of an underground mining operation and early in 1969 the company was investigating alternate methods of implementing such an operation.

The following summary of operating results for 1968 and ore reserve data was provided by the company.

	1967[1]	1968[2]
Dry tons milled	453,056	732,095
Daily average, tons	2,006	2,005
Copper concentrate (%)	29.42	31.28
Mill heads:		
Copper(%)	1.17	1.03
Silver (oz/ton)	0.198	0.202
Gold (oz/ton)	0.0193	0.0227
Metal production:		
Copper (lbs)	7,314,203	12,159,551
Silver (oz)	89,786	148,189
Gold (oz)	8,753	16,597
Metal sales[3]:		
Copper		$5,680,941
Silver		302,974
Gold		646,678
Total sales	4,473,000	6,630,593
Total ore reserves (as of January 1, 1969)		
Open pit (tons)	4.6 million	3.8 million
Copper (%)	1.2	1.14
Silver (oz/ton)	0.198	0.198
Gold (oz/ton)	0.0193	0.0193
Underground (tons)[4]	5.0 million	5.0 million
Copper (%)	2.0	2.0
Silver (oz/ton)	0.198	0.198
Gold (oz/ton)	0.0193	0.0193

[1] For the 8-month period 1 May-31 December, 1967. Production from Little Chief Mine only.
[2] Production from Little Chief and Arctic Chief Mines.
[3] Without deductions for smelter charges, freight and marketing costs.
[4] Little Chief Mine.

The geology of the Little Chief and Arctic Chief deposits is fairly typical of most of the Copper Belt occurrences. They consist of bornite-chalcopyrite and bornite-chalcopyrite-magnetite assemblages in irregular lenses and patches occurring near the margins of a large skarn zone developed in Lewes River (Triassic) limestone adjacent to Coast Range intrusions

of granodioritic to dioritic composition. The skarn is variable in composition but in the Little Chief and Arctic Chief zones it is composed principally of calcium-magnesium-iron assemblages that include diopside, epidote, tremolite-actinolite, garnet, serpentine, magnetite and/or hematite and rarely, asbestos. Characteristics and grade of the Arctic Chief and Little Chief ores are similar, except that the former appears to be richer in gold and silver values*.

During 1968 the company continued surface exploration on other of its Copper Belt holdings. In addition to further detailed work on the War Eagle property, geological mapping, and ground electromagnetic and magnetic surveys were carried out on the Best Chance, Cowley Park, Pass Lake and Gem properties. Exploration diamond drilling totalling 19, 913 feet in 55 holes was completed, principally on the Best Chance, War Eagle, Gem and Cowley Park properties. Minor drilling was also done on the Middle Chief occurrence. A crew of up to 20 men was employed on the surface exploration programs.

TOPAZIOS GROUP

Topazios Mining and Exploration Limited
950 Eyremount Drive,
West Vancouver, British Columbia.

Copper
(60°40'N, 135°07'W and
60°43'N, 135°07'W)

Reference: Wheeler (1961).

Topazios Mining and Exploration Limited holds a total of 51 claims located in two groups about 1 mile west of the Alaska Highway, between Miles 915 and 917.

The claims are adjacent to holdings of New Imperial Mines Limited and cover areas underlain chiefly by Coast Range granodioritic rocks (unit 8, Wheeler, 1961). During the 1968 season reconnaissance geological, geochemical and geophysical (magnetometer, electromagnetic) surveys were reportedly conducted over parts of the claim group.

LEWES RIVER MINES LIMITED
Suit 410 - 355 Burrard Street,
Vancouver, British Columbia.

Copper
(about 60°35'N to 47.5'N;
134°50'W to 135°07'W)

References: Kindle (1964); Wheeler (1961).

Lewes River Mines Limited holds 522 claims lying in a 17- by 2-mile belt along the eastern side of the Whitehorse Copper Belt. The property adjoins holdings of New Imperial Mines Limited over much of its length, straddles Yukon River in places, and extends from about 2 miles east of the Carcross Road-Alaska Highway junction on the southeast, to the mouth of Croucher Creek at Yukon River on the northwest.

The claims were staked to cover an area of potentially favourable geology on the assumption that the eastern contact of the Cretaceous granodiorite stock (unit 8, Wheeler, 1961) with which the known deposits of the Copper Belt are associated must extend beneath the overburden-covered lowlands east of Yukon River. This assumption gained support from government

* R.G. Hilker, personal communication.

aeromagnetic maps* which showed magnetic features in the critical area that are reasonably interpreted as reflecting the contact between granodiorite and the invaded Lewes River sedimentary rocks (unit 3, op. cit.).

Early in 1968 a low-level aeromagnetic survey was conducted over the claim area and vicinity to provide increased definition and detail of magnetic features revealed on the government maps. This survey isolated two areas of potential interest and during the 1968 field season detailed ground magnetometer and I. P. surveys were carried out over these areas. Further work, including diamond drilling, is planned for 1969.

Mud Lake

DOUBLE A MINES LIMITED
610 - 890 West Pender Street,
Vancouver, British Columbia.

Copper
(60°28'N, 130°40'W)

This 210-claim group was staked early in 1968 to cover magnetic anomalies outlined on a government aeromagnetic map**. The property is about 28 miles southwest of Whitehorse, near the claims of Canzac Mines Limited (Findlay, 1969, pp. 54-55).

The claims lie in a broad glacial-debris-filled valley that contains a shallow lake known locally as 'Mud Lake' and that is drained by Rose Creek. Outcrop is sparse, but Wheeler (1961) shows Lewes River sedimentary rocks (unit 3a) and volcanics of uncertain age (unit A) cropping out to the north of the property. Granodiorite (unit 8, op. cit.) is exposed to the south of the claim group. Following a low-level airborne magnetometer survey early in 1968 three diamond-drill holes totalling about 1,600 feet were drilled on magnetic targets. The drilling showed, as was the case on the adjacent Canzac Mines Limited property, that the anomalies were caused by magnetite-bearing olivine pyroxenite, part of an ultramafic intrusion of unknown extent. Minor copper mineralization was reportedly present in drill cores also.

Subsequent to the drilling program which was completed in June, 1968 an I. P. survey was conducted over part of the property. Further work on the property is planned for 1969.

CARCROSS AREA

Montana Mountain

ARCTIC GOLD AND SILVER MINES LIMITED
1130 - 355 Burrard Street,
Vancouver, British Columbia.

Silver-Gold
(60°05'N, 134°32'W)

References: Cairnes (1906, pp. 24-25; 1908, p. 14; 1917, pp. 28-36; in Bostock, 1957, pp. 209-217; 245-275; 426-459); Cockfield and Bell (1926, p. 39; 1944, p. 12); Wheeler (1961, p. 127); Green (1966, pp. 56-60); Findlay (1967, pp. 46-47; 1969, pp. 58-60).

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* Geological Survey of Canada, Geophysics Papers 1342G (Cap Creek), 1341G (MacRae), 3376G (Whitehorse) and 3377G (Upper Laberge).

** Geological Survey of Canada, Geophysics Paper 3359 (105D/5).

Production from Arctic Gold and Silver Mines Limited's Carcross silver-gold property, the Arctic Caribou (Big Thing) Mine commenced in mid-May, 1968. First concentrates were produced in June and the official opening ceremonies were held at the mine site in mid-August.

The property commenced production at a planned rate of about 150 tons per day, but for the first 6 months tune-up problems and ore-grade difficulties plagued the operation and production was erratic. Pending arrangements for additional development capital and to allow modifications to the mill system, the mill was shut down over the period December 20, 1968 to March 15, 1969, although mining and ore stockpiling continued through this period. Following refinancing full production resumed in March and by the spring of 1969 the operation had stabilized on a 175-200 ton per day basis.

The following is a summary of production statistics over the 7-month period June-December, 1968.

Dry tons milled	30,811
Daily average, tons	154
Mill heads:	
Gold (oz/ton)	0.283
Silver (oz/ton)	10.498
Metal production:	
Gold (oz)	3,007.7
Silver (oz)	87,338.0
Metal sales[1]	$131,000

[1] Excluding smelting, transportation and marketing charges.

The last published ore reserves for the property were given as: proven ore - 22,900 tons grading 0.48 ounce per ton gold and 19.6 ounces per ton silver; probable ore - 77,110 tons grading 0.32 ounce per ton gold and 9.2 ounces per ton silver (Northern Miner, January 23, 1969 and Western Miner, January, 1969).

The Arctic Caribou property consists of two Crown Grant Claims ('Pride of the Yukon' and 'Caribou') and a further 82 claims located on Sugarloaf Hill about 1 mile north of Montana Mountain summit. The main entry (800 level) is located on the south side of Sugarloaf Hill at an elevation of about 5,400 feet. In 1968 development of a second level (700 level) was begun from an adit driven below the 800 portal at an elevation of about 5,275 feet. In additon to these entrances, old working dating from 1905-1910 include a 450-foot inclined shaft on the southwest side of Sugarloaf Hill at an elevation of about 5,800 feet, and a 2,320-foot horizontal tunnel ('Peerless' tunnel) driven northeasterly into the hill from an elevation of about 5,100 feet.

The mill and camp buildings are on the north flank of Montana Mountain at an elevation of about 3,400 feet and are linked with the mine via a 5-mile, all-weather road. The mill is about 3.6 miles by road from the village of Carcross.

The gold and silver values occur in northeast-striking quartz veins that cut altered granodiorite which is probably part of a larger stock that extends north to Carcross (unit 8, Wheeler, 1961). The dip of the veins ranges from shallowly northeast to about 45 degrees northwest over local sections. The veins contain pyrite, arsenopyrite, sphalerite, galena and rare chalcopyrite occurring as bands and lenses within quartz. The vein structures are commonly bordered by a selvage zone of intensely altered granodiorite.

The two principal veins explored and developed in the mine are the No. 1 ('Footwall') and No. 2. The No. 1 vein, intersected in the main entry (800 level) about 225 feet from the portal, was explored by drifting east and west (835E Dr and 835W Dr) for distances of about 250 and 525 feet respectively. Although some ore was encountered in these sections, grade was generally erratic and little mining has been carried out in this part of the mine. The No. 2 vein was intersected by the main crosscut about 550 feet beyond the No. 1 and developed to the east by the 850E Dr. A small area near the junction of the main crosscut and the 850E Dr has provided some of the best ore found to date and during the winter of 1968-69 this ore pocket was mined out (849 stope). A chip sample collected by the writer across 18 inches of nearly flat-lying vein in this stope assayed*: 3.00 ounces per ton gold; 75.4 ounces per ton silver; 1.35 per cent lead; and, 3.3 per cent zinc.

Immediately west of the 849 stope the No. 2 vein is displaced to the north by a northwest-trending fault. The vein extension was located west of the fault and developed from the 848E Dr which leaves the main crosscut about 125 feet past the fault. A series of parallel slot-stopes were driven up the plane of the vein (about 30 degrees) and this area, along with the 849 stope, has provided the bulk of the millfeed ore to date.

In August 1968 a portal site for the 700 level entry was established 125 feet vertically below the 800 portal and driving of the adit began in October. About 650 feet from the portal a prominent vein structure (No. 7 or 'Portal' vein) was intersected and drifting to follow its extensions east and west of the adit was commenced. In the vicinity of the crosscut the vein is up to 3 feet thick, dips shallowly northwest and is marked by a prominent, knife-edge hanging-wall contact. Visible sulphide content in this area is low.

During 1968 a crew ranging from 50 to 90 men was employed on the project.

VENUS MINES LIMITED
440 - 890 West Pender Street,
Vancouver, British Columbia.

Gold-Silver
(60° 01'N, 134° 38.2'W)

References: Cairnes (1908, pp. 16-17; 1909, p. 31; 1917, pp. 39-41; in Bostock, 1957, pp. 254-255; 282; 447-459); McLean (1914, pp. 194-200); Cockfield and Bell (1926, p. 40); Wheeler (1961, pp. 129-130); Findlay (1967, pp. 48-50; 1969, pp. 62-64)

Venus Mines Limited continued underground exploration of its Windy Arm silver-gold property in 1968 and late in the year released results of a feasibility study which recommended bringing the property to production on a 300 ton per day basis. In the spring of 1969 the company began negotiations for financing to bring the property into production.

The Venus property consists of 40 claims (including 8 Crown Grants) located along the west side of Windy Arm, Tagish Lake about 4 miles southwest of the site of the long-abandoned settlement of Conrad City. Between about 1904 and 1918 this area was intermittently explored for gold and silver and numerous properties, including Venus No. 1, Venus No. 2, Venus Extension, Vault, Montana, Mountain Hero, Dail, Fleming and M and M amongst others, were worked to varying degrees. A 100-ton mill built on

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* Assayed by G. Spalding, Whitehorse, Yukon Territory.

the lakeshore in 1908 to treat ore from several of these properties still stands. Ore was transported to the mill by an aerial bucket tramway leading from the Venus portal downhill to the mill. Small ore shipments were made intermittently and Cairnes (1917) reported that about 6,000 tons of ore was supposed to have been mined from the Venus properties, part of which was shipped to smelters.

The gold and silver ores of the Conrad district occur in a series of northerly-trending, shallowly west-dipping quartz veins cutting a variety of volcanic rocks of the Cretaceous Hutshi Group (unit 7, Wheeler, 1961). The Venus vein has been traced for more than a mile. It contains coarse crystalline quartz and carbonate carrying bands and lenses of pyrite, arsenopyrite, galena, sphalerite and minor chalcopyrite. The vein strikes N10° E on the average, dips 35 degrees west and ranges from a few inches to 5 to 6 feet in thickness.

The present company began investigation of the Venus property in May, 1966. Since that time about 7,100 feet of drifting and crosscutting, 650 feet of raising and 2,900 feet of diamond drilling have been completed from two underground working levels. The initial adit (2700 level) located at an elevation of 2,724 feet consists of a 350-foot crosscut and about 3,400 feet of drifting, principally on three drifts - 27-1-2 North, 27-2A West, and 27-2A North. The latter two drifts provided the best ore sections and 12 ore shoots ranging in length from 15 to 105 feet and totalling 609 feet were outlined along them. Ore grades range from 0.185 ounce per ton gold and 22.0 ounces per ton silver over a width of 5.4 feet (15-foot ore shoot) to 0.329 ounce per ton gold, 10.36 ounces per ton silver, 2.12 per cent lead and 1.92 per cent zinc over 5.4 feet (105-foot ore shoot) in these sections (Northern Miner, October 19 and November 24, 1967). Raises, driven updip at a number of locations from the 2700 level, have extended these sections over dip-lengths of up to 340 feet.

In April, 1968 a second exploration level (2600 level) was established from a portal located about 1,200 feet northeast of the 2700 portal and at an elevation of 2,622 feet. During 1968 a total of 3,040 feet of drifting and 375 feet of raising were completed from the 2600 level. At the end of the year the 2600 level workings consisted of about 1,440 feet of crosscutting and 1,200 feet of drifting, mainly on the 26-2 North drift (900 feet) which lies downdip and north of the 2A North drift on the 2700 level. A raise (26-825), located about 150 feet north of the 26-2 North drift - main crosscut intersection was driven updip to link with the 2700 level and a 2,650 sublevel was established from this raise and driven about 150 feet to the south.

The 26-825 raise linking the 2600 and 2700 levels exposes one of the best vein sections in the mine. It consists of alternating bands of quartz and massive sulphides (pyrite, arsenopyrite, galena, and sphalerite) over total widths up to 5 feet.

A composite bulk sample, consisting of 34 100-pound samples taken at 5-foot intervals on the 2700 level yielded a grade of 0.39 ounce per ton gold, 11.55 ounces per ton silver, 2.58 per cent lead, 1.67 per cent zinc and 0.093 per cent cadmium (Northern Miner, September 19, 1968). Ore reserves are considered as: proven - 75,470 tons; probable - 59,375 tons; inferred 415,955 tons.

In addition to the underground exploration program carried out in 1968, the company also completed a new 17-mile all weather access road from Carcross to the mine site.

A crew of 16 men was employed on the project in 1968.

Windy Arm

LULU GROUP
Premier Mining Corporation Limited
818 - 510 West Hastings Street,
Vancouver 2, British Columbia.

Gold-Silver-Nickel-Copper
(60°05'N, 134°33'W)

References: Cairnes (1908; in Bostock, 1957, p. 255); Wheeler (1961).

The 16-claim Lulu Group lies near the headwaters of Ramshorn Creek which flows into Windy Arm of Tagish Lake from the height of land along the British Columbia border.

The claims cover an old showing which was apparently investigated briefly in or about 1907 (Cairnes, 1908) by two short tunnels. Quartz and 'skarny' vein material cutting altered volcanic rocks of the (?)Taku Group (unit 2d, Wheeler, 1961) reportedly carry gold, silver, copper and some nickel values. The property was not visited in 1968.

UPPER WHITE RIVER AREA

White River

MICRO GROUP
Discovery Mines Limited
1011 - 2200 Yonge Street,
Toronto, Ontario.

Nickel-Copper
(61°57'N, 140°32'W)

References: Campbell (1960); Muller (1958, 1967); Findlay (1967, pp. 13-16; 1969, pp. 65-68).

During 1967 and 1968 this property was reinvestigated through surface and underground drilling by a consortium of companies comprising Discovery Mines Limited (50 per cent interest), Rayrock Mines Limited (25 per cent interest) and Consolidated Canadian Faraday Mines Limited* (25 per cent interest). The property was held under option agreement with owners P. Versluce and associates of Whitehorse and the work was carried out under the management of Discovery Mines Limited. The option was terminated in the fall of 1968.

The property, comprising the old Canalask Nickel Mines Limited holdings, consists of 54 claims located on the east and west banks of White River. The claims are reached by a 2.8-mile access road that leaves the Alaska Highway at about Mile 1167 1/2.

White River nickel-copper sulphides occurring near and along the northeast contact of a steeply north-dipping ultramafic intrusion (dunite, peridotite, feldspathic peridotite and olivine gabbro) have been investigated intermittently since their discovery in 1952 by Prospectors Airways Limited (for a detailed description of the property see Findlay, 1967, pp. 50-51; 1969, pp. 65-68). Between 1954 and 1958, Canalask Nickel Mines Limited

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* In 1968 this company was replaced by Pacific Petroleums Limited in the consortium.

carried out extensive surface and underground exploration including 1,700 feet of underground drifting, 1,500 feet of underground drilling, and 8,785 feet of surface drilling. Work was suspended in the spring of 1958 at which time ore reserves of 550,000 tons averaging 1.68 per cent nickel were reportedly indicated.

Following the Canalask period, the property was idle until 1966 when P. Versluce and associates, who had staked it in 1964, carried out some surface work including blasting and bulldozer trenching. This work uncovered several new mineralized zones which were further investigated in 1967 by Discovery Mines Limited. The 1967 work included geophysical surveys, bulldozer trenching and 1,311 feet of surface diamond drilling (2 holes).

Encouraged by results of the 1967 drilling, which indicated a possible extension of the ore zone beneath White River and beyond a fault which had previously been thought to terminate the mineralization, the company began rehabilitation of the underground workings in the spring of 1968. Deicing and dewatering of the 2400 level workings which are connected to the 2700 level workings (main entry) by a 336-foot winze, was carried out, and an underground drilling program involving 1,217 feet was carried out. The drilling confirmed the presence of sulphide mineralization west of the White River Fault, but nickel and copper values were 'negligible' (Discovery Mines Limited, Annual Report, 1968). In addition to the underground work, minor surface drilling was also carried out before the project was terminated in August, 1968.

Canyon City

SILVER CITY MINES LIMITED
1322 - 510 West Hastings Street,
Vancouver, British Columbia.

and

Casca Building,
Whitehorse, Yukon Territory.

Copper
(61°47'N, 140°47.5'W)

References: Findlay (1967, pp. 51-52; 1969, pp. 68-70).

The 224-claim White River property of Silver City Mines Limited is on the east side of upper White River about 18 miles south of Mile 1168 on the Alaska Highway. Winter access is provided by a 20-mile tote trail that leaves the road to the old Canalask Nickel property about 2 miles south of the Alaska Highway. An airstrip is also maintained on a gravel bench near the east bank of White River about 3 miles north of the property.

Occurrences of native copper with chalcocite and chalcopyrite in Triassic Mush Lake Group basalt have been known in this area since the turn of the century and the White River property includes several of the original Crown Grant Claims that covered old workings on some of these showings. A large slab of native copper, weighing approximately 3,000 pounds that is now on display at the Yukon Historical Society McBride Museum in Whitehorse originally came from one of these old prospect adits.

In 1967 a significant new showing was discovered by bulldozer trenching near one of the original adits located about 300 feet above the east bank of White River. Stripping of the area exposed a 39-foot-wide mineralized

zone in fractured, dark green, locally amygdaloidal Triassic Mush Lake Group basalt (unit 13, Muller, 1967). Copper mineralization occurs as clusters of narrow stringers and lenses of steely chalcocite with subordinate native copper and minor bornite. Assay values across the zone as exposed by the initial trenching were: eastern 9 feet - 0.76 per cent copper; western 30 feet - 3.53 per cent copper and 0.2 ounce per ton silver (Northern Miner, January 11, 1968).

Following discovery of the new zone in the fall of 1967, Silver City Mines Limited entered into an agreement with Central Del Rio Oils Limited and a private company - United Pemetex Limited - was formed to explore the property. In the spring of 1968 the new company carried out an 11-hole (2,600 feet) diamond drilling program in the vicinity of the showing. While several of the holes cut good grade copper mineralization, its distribution proved erratic and the results suggested that the mineralized zone is structurally complex.

During the 1968 field season, I. P. and ground magnetometer surveys were carried out over part of the White River property (20 claims) and several geophysical anomalies were outlined. Following this phase of exploration, Central Del Rio Oils Limited terminated its option agreement with Silver City Mines Limited, and sole ownership of the property reverted to the latter company. On the basis of the geophysical results a single diamond-drill hole was sunk late in 1968 at a location about 720 feet north of the main discovery zone and on strike with it. This hole (No. 12) cut three zones carrying economic-grade copper within a 56-foot intersection. Assay values recorded were: 1st zone - 7.36 per cent copper over 11 feet; 2nd zone - 5.10 per cent copper over 5.0 feet; 3rd zone - 6.20 per cent copper over 3.5 feet. The total 56-foot section (calculated true width is 42 feet) averaged 2.55 per cent copper (Northern Miner, December 29, 1968). Following this drilling, operations were suspended for the season, but were to be resumed in March, 1969.

NACK CLAIMS
Gaylord Mines Limited
328 - 736 Granville Street,
Vancouver 2, British Columbia.

Copper
(61°46.5'N, 140°44'W)

Gaylord Mines Limited, in conjunction with Quatsino Copper-Gold Mines Limited and New Privateer Mine Limited, holds the 48-claim Nack Group in Upper White River area. The claims lie about 16 miles south of the junction of White and Generc rivers and about a mile southeast of Rifle Lake. They are south of and adjacent to the White River property of Silver City Mines Limited (United Pemetex Limited). Access to the property is afforded by the seasonal tote-road that leads from Mile 1167 on the Alaska Highway to the United Pemetex camp at Rifle Lake.

The area is overburden-covered, but based on the surrounding geology (Muller, 1967) it is probably underlain mainly by Cache Creek Group (Permian) sedimentary and volcanic rocks (units 11 and 10, op. cit.). Basaltic rocks of the Triassic Mush Lake Group (unit 13, op. cit.) underlie parts of the United Pemetex property to the north and may extend beneath part of the Nack property.

Work done in 1968 consisted of reconnaissance geology and prospecting and ground magnetometer and I. P. surveys. A number of anomalous

areas were outlined, on which further work is planned. Of particular interest in this area is the presence of several significant negative magnetic anomalies, the cause of which is unknown.

JERSEY CONSOLIDATED MINES LIMITED
572 Howe Street,
Vancouver, British Columbia.

Copper
(61° 46'N, 140° 45'W)

Reference: Muller (1967).

This company holds 24 claims (Doug Group) located about 6 miles southwest of the junction of White and Generc Rivers and adjacent to the White River property of United Pemetex Limited (Silver City Mines Limited). No outcrop is present on the property but according to Muller (1967) the general area is underlain chiefly by Cache Creek Group volcanic rocks of Permian age (unit 10, op. cit.).

In 1968 the company conducted ground magnetometer and Induced Polarization surveys over parts of the Doug property.

Kletsan Creek

WHITE RIVER MINES LIMITED
102 - 569 Howe Street,
Vancouver, British Columbia.

Copper
(61° 36'N, 140° 57'W)

References: Cairnes (1915, pp. 133-138); Muller (1967, pp. 108-109).

This company carried out surface exploration, including prospecting, and electromagnetic and geochemical surveys on its 54-claim K-Cu group in 1968. The claims are located on upper Kletsan Creek near the Alaska-Yukon border and immediately west of Natazhat Glacier. The property is about 16 miles south of the Silver City Mines Limited copper prospect on Upper White River.

Native copper nuggets have been recovered from the gravels of upper Kletsan Creek since the turn of the century and it has been assumed that the source of the copper lies on the Alaska side of the border. The present claim group was staked with the view of re-examining this assumption through investigation of the area immediately surrounding the placer occurrences.

Much of the property is covered by a volcanic ash layer that is up to 10 feet thick. According to Muller (1967) the property area is cut by a northwest-trending thrust fault, southwest of which are exposed volcanic rocks of the Triassic Mush Lake Group (unit 13, op. cit.) and limestone of the Permian Cache Creek Group (unit 11a, op. cit.). During the 1968 work by White River Mines Limited several native copper float occurrences were found which, because of the nature of the float, were interpreted by company personnel as probably having travelled only relatively short distances from their source.

KLUANE AREA

Quill Creek

WELLGREEN PROPERTY
Hudson Bay Mining and Smelting Company Limited — Nickel-Copper
Flin Flon, Manitoba. — (61°28'N, 139°30'W)

References: Campbell (1960); Muller (1958; 1967); Findlay (1967, pp. 52-53).

The Wellgreen property, generally similar in geologic setting to the Canalask Nickel property on White River (see pp. 76-77 this report) was extensively developed by Hudson-Yukon Mining Company Limited (a subsidiary of Hudson Bay Mining and Smelting Company Limited) during 1953-1956. Since then the property has been idle but a watchman has been stationed on the property and equipment and mining facilities maintained in good order.

The property is reached by an 8-mile access road that leaves the Alaska Highway near Mile 1111 and follows the valley of Quill Creek to the mine camp, located just above the junction of Nickel and Quill creeks. The sulphide ores (pyrrhotite, chalcopyrite and pentlandite) occur as massive to heavily-disseminated lenses within and adjacent to a narrow gabbroic footwall zone of a steeply south-dipping ultramafic sill (dunite, serpentinized peridotite, feldspathic peridotite). A total of about 14,000 feet of underground drifting, raising and sinking and 65,000 feet of underground and surface diamond drilling completed in 1956 and previous years outlined 737,600 tons of ore averaging 2.04 per cent nickel, 1.42 per cent copper and some values in cobalt, platinum and palladium.

In 1968 the company began a program of reinvestigation and re-evaluation of the Wellgreen property. Ground geophysical surveys carried out in the vicinity of the main showings and elsewhere on the property outlined several anomalous areas. A drilling program to test the anomalies is planned for the 1969 season.

DEZADEASH AREA

Tatshenshini River

JACK POT COPPER MINES LIMITED — Copper
Whitehorse, Yukon Territory. — (60°03'N, 137°07'W)

Reference: Kindle (1953).

Jack Pot Copper Mines Limited holds 206 claims covering a copper prospect located about 1 mile east of Tatshenshini River and about 6 miles southwest of the abandoned settlement of Dalton Post. The property was originally staked in 1965 and the present company acquired it in 1966. During 1967, ground geophysical (electromagnetic and magnetic) and geochemical surveys were conducted over parts of the property, and in 1968 bulldozer trenching near a small gossan resulted in the discovery of interesting copper mineralization late in the season.

The original discovery outcrop comprises a rusty, gossanized shear zone containing quartz breccia-filling with disseminated chalcopyrite

and copper oxide (malachite and azurite) staining. The shear zone trends slightly west of north, dips steeply east and lies along the contact between fine- to medium-grained granitic intrusive rock (unit 7a, Kindle, 1953) to the east and fine-grained schistose andesite or basalt to the west (Mush Lake Group, unit 3, op. cit.).

During the 1968 season, bulldozer trenching and benching immediately south of, and upslope from the discovery showing, exposed an extension of the mineralized zone carrying massive chalcopyrite with subordinate pyrite. At the time of the writer's visit (mid-October) the bulldozer work had traced the mineralized zone for a strike distance of about 90 feet. The width of the zone could not be determined, due to rubble, but massive to submassive copper mineralization is present locally over widths up to 18 to 24 inches. Host rock of the mineralization is altered greenschist (unit 3, op. cit.) locally brecciated and veined with quartz and carbonate.

The Jack Pot copper showing appears similar to chalcopyrite-(bornite) occurrences elsewhere in Mush Lake volcanic rocks, the best known of which is the Johobo Mines Limited Sockeye Lake property investigated in 1963-64 (Kindle, 1953, pp. 57-58).

WATSON LAKE MINING DISTRICT

PELLY MOUNTAINS AREA

Ketza River

SILVER KEY MINES LIMITED
STUMP MINES LIMITED
1102 - 347 Bay Street,
Toronto, Ontario.

and

800 - 789 West Pender Street,
Vancouver, British Columbia.

Silver-Lead
(about 61° 31.5'N,
132° 11'W)

References: Wheeler, Green and Roddick (1960a); Skinner (1961, pp. 39-40; 1962, p. 36); Green (1966, pp. 64-68); Findlay (1967, pp. 56-58; 1969, pp. 75-76).

Silver Key Mines Limited and Stump Mines Limited continued joint exploration of their Ketza River silver-lead holdings in 1968. The properties consist of adjacent claim-blocks totalling 226 claims that are located near the headwaters of Ketza River, and about 32 miles south-southeast of Ross River. The properties are reached by a 23-mile access road that leaves the Watson Lake-Ross River road about 11 miles east of its junction with the Canol road. A permanent base camp is maintained at the junction of Cache Creek and Ketza River and an old airstrip near the camp has recently been upgraded and is suitable for light aircraft.

Silver-lead occurrences of Ketza River area have been investigated intermittently since the discovery of the first showings in 1947. Exploration by various companies, including Hudson Bay Exploration and Development Company Limited, Conwest Exploration Company Limited and Silver Key Mines Limited (since 1964) has resulted in the discovery of numerous

silver-lead veins and, at present, about 28 occurrences are known in the Upper Ketza River area. Some of these occurrences are described by Green (1966, pp. 64-68) and Findlay (1967, pp. 56-58; 1969, pp. 75-76). Typically, they consist of mineralized vein breaks cutting various sedimentary rock types including quartzite, quartzitic schist, phyllite, silty dolomite and argillaceous rocks containing graphitic layers, all of which were considered Mississippian or earlier age (Wheeler, Green and Roddick, 1960a). Vein material is usually quartz and siderite with variable amounts of galena, pyrite and subordinate sphalerite. Mineralization is best developed where the vein breaks cut more competent rocks such as quartzite; in the phyllitic and argillaceous rocks sulphides commonly occur as thin, discontinuous stringers or as disseminations conformable to schistosity and bedding planes.

As a result of geochemical surveys carried out in 1966 and 1967 by Silver Key Mines Limited and adjacent Stump Mines Limited, several new showings were discovered that were further investigated in 1967 and 1968 by the two companies operating on a joint-venture basis. The most significant of the new showings, the 'A-1', consisted of a prominent north-striking mineralized fracture zone cutting fine-bedded silty limestone, grey sericitic phyllite and graphitic argillite (unit 2, Wheeler, Green and Roddick, 1960a) containing local quartz bands and lenses. Surface exploration, bulldozer trenching and limited diamond drilling (5 holes totalling 950 feet) in 1967 outlined a zone containing ore-grade mineralization over a strike length of 810 feet and over widths up to 4 to 5 feet. Surface assays averaged 24.9 ounces per ton silver and 22.2 per cent lead over a 4-foot width; drilling results, although not conclusive because of poor core recovery, indicated that the vein extended to at least 90 feet below surface and one hole (No. 3) cut 3.7 feet of typical vein material grading 26.0 ounces per ton silver and 23.2 per cent lead (Can. Mining J., December, 1967).

During the 1968 season an underground exploration program was carried out on the A-1 zone from an adit collared at an elevation of about 5,350 feet and about 400 feet southeast of the vein exposure at surface. A crosscut, driven in a northwesterly direction for a total of 420 feet intersected the vein about 340 feet from the portal. Drifting continued on the vein for about 800 feet to the north and outlined a total length of 506 feet of ore-grade mineralization comprising four sections with the following dimensions:

44 feet by 2.4 feet averaging 18.2 ounces per ton silver
376 feet by 2.3 feet averaging 19.5 ounces per ton silver
68 feet by 2.5 feet averaging 15.7 ounces per ton silver
18 feet by 2.8 feet averaging 22.4 ounces per ton silver

(Western Miner, September, 1968)

A total of 35,000 tons of ore averaging 19.42 ounces per ton silver and 10 per cent lead was estimated for the A-1 zone as a result of the underground work. In addition to the drifting and crosscutting, a 150-foot raise was driven from the 5,350 level to surface to test the updip continuity of the vein. The vein in the first 67 feet of the raise reportedly averaged 20.6 ounces per ton silver over a width of 4.8 feet (Northern Miner, September 12, 1968).

As exposed in the 5350 drift, the A-1 vein is a fairly strong and continuous structure that has an average width of about 4 feet and that dips about 55 degrees west. Typically, the vein consists of quartz-siderite carrying a band of massive galena within it that ranges from 4 inches to 1 foot in thickness. Locally the galena is the fine-grained 'steel' variety but normal

coarsely-crystalline material is present also. Host rocks are chiefly limy argillites with the footwall rocks being more siliceous and competent than the hanging-wall varieties.

In addition to work on the A-1 zone the companies carried out surface and underground exploration on several other showings in the area in 1968 and early 1969. On the 'F-2' showing (see Findlay, 1967, pp. 57-58) located on a shoulder above Cache Creek to the north of the A-1 zone, 176 feet of drifting was done from an adit located at an elevation of 4,850 feet. The vein proved weak underground and silver values were not of economic interest although a small (30 feet by 2.4 feet) ore shoot carrying interesting gold values was encountered.

On the 'Lap 10' showing, located about 3 miles north of the 'F-2' zone and above the north fork of Cache Creek, a total of about 235 feet of drifting and 50 feet of raising was carried out from an adit located at an elevation of about 5,300 feet. This work was done to test a siderite-galena vein previously exposed by bulldozer trenching. The vein strikes about N40°E dips about 35 degrees northwest and cuts finely laminated phyllite and shale. A grab sample of massive galena collected by the writer from the surface exposure of this vein assayed*: 0.005 ounce per ton gold; 69.2 ounces per ton silver; 74.5 per cent lead. A chip sample across 7 feet of vein material and altered wall rock assayed*: 24.7 ounces per ton silver; 29.7 per cent lead. In spite of the promising surface appearance of this vein, the underground work proved it to be weak and discontinuous and assay results were disappointing.

A new showing area, the 'Key 18A and 18B', discovered as a result of geochemical surveys conducted in 1968 was also investigated. This area lies about 9,000 feet northeast of the A-1 zone and about 3,500 feet from the camp. Bulldozer trenching over the upper ('Key 18A') anomaly uncovered numerous boulders of sulphide float but no significant bedrock vein structures. On the 'Key 18B' anomaly, located east of and downslope from the 'Key 18A', bulldozer trenching exposed a north-northeast-trending vein structure carrying significant galena mineralization. The Key 18B 700 adit, driven from an elevation of 3,852 feet outlined a small ore shoot carrying economic grade silver values. A total of about 400 feet of drifting and crosscutting was completed on this level. A second level (800) was established 100 feet below the 700 level and about 630 feet of drifting and crosscutting was completed to test the downdip extension of the K-18B structure. The results of this work suggest that the structure is weakening with depth.

Late in 1968, a second adit (250 level) was driven 100 feet below the main adit in the A-1 zone. The face of the crosscut was advanced to 80 feet before operations were suspended for the Christmas holidays. Additional work on the property is planned for 1969.

Groundhog Creek and Seagull Lakes

CANOL MINES LIMITED
1111 West Hastings Street,
Vancouver, British Columbia.

Silver-Lead
(61°39'N, 132°48'W)

References: Wheeler, Green and Roddick (1960a); Findlay (1969, pp. 77-78).

* Assayed by G. Spalding, Whitehorse, Yukon Territory.

Canol Mines Limited holds 78 claims covering a silver-lead prospect between Seagull Lakes and upper Groundhog Creek about 26 miles southwest of Ross River. The property is reached by a 12-mile access road that leaves the Canol Road near Lapie Lakes (Mile 98).

The main (No. 1) showing is at an elevation of about 5,800 feet on the west slope of a peak immediately west of lower Seagull Lake. It consists of a north-trending, steeply to vertically-dipping, heavily oxidized vein break cutting blue-grey, silicified dolomite of probable Devonian age (unit 4, Wheeler, Green and Roddick, 1960a). The break carries quartz, siderite and massive coarse-grained galena with minor pyrite occurring in bands and lenses locally up to 2 1/2 feet thick. The mineralized zone has been traced along strike for 200 feet and appears to pinch out at its extremities. A total of about 3,600 feet of diamond drilling carried out in 1967 (5 holes) and 1968 (11 holes) delineated the zone fairly completely and it is estimated to contain 2,000 tons of ore with a value of about $200,000* (Can. Mining J., October, 1968).

A second vein (No. 2) located about 7,500 feet south of the No. 1 zone and at a higher elevation (about 6,400 feet) was discovered in 1968. This showing was not seen by the writer, but surface stripping carried out during the 1968 season reportedly indicated a potential 200-foot ore shoot having an average grade of 8.60 ounces per ton silver, and 14.7 per cent lead across an average width of 17.5 feet (Northern Miner, February 27, 1969). Additional work, including diamond drilling, is planned on this showing for 1969.

Elsewhere on the property, about 7,000 feet of bulldozer trenching has been completed in a number of trenches cut to investigate geochemical anomalies. Most of the trenches lie downslope from and to the west of the main (No. 1) showing and the rock types exposed are chiefly grey to black graphitic and phyllitic sediments, probably of Cambrian age (unit 2, op. cit.). One trench (No. 6) exposed minor rusty vein material carrying disseminated galena. This was further investigated in 1968 by two diamond-drill holes with negative results.

In addition to work on the above showings, the company also staked a total of 324 claims in an area lying east of Seagull Lakes in which mineralized float was located. Exploration of this ground is planned for 1969.

FRANCES LAKE AREA

Frances Lake

MATT BERRY MINES LIMITED
801 - 347 Bay Street,
Toronto, Ontario.

Silver-Lead
(61°28.5'N, 129°25'W)

Reference: Findlay (1967, p. 63).

Matt Berry Mines Limited resumed exploration, including diamond drilling, of its Frances Lake silver-lead prospect in 1968, following a year's absence from the area (1967). The property consists of 40-claims located near the mouth of Thompson Creek on the east side of East Arm, Frances Lake. Silver-bearing sulphide mineralization was first discovered and staked in the late 1930s by A.K. Money and in 1943 the area was prospected for

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* At September, 1968 metal prices.

Consolidated Mining and Smelting Company of Canada Limited. Following this the property was idle until 1960 when Datlaska Mines Limited carried out further surface exploration during the period 1960-1963. In 1965 the property was acquired by the present company and in 1968 the showing was investigated by 14 diamond-drill holes totalling 2,120 feet.

The showing lies at an elevation of about 2,790 feet immediately south of Thompson Creek and about 1,000 feet from the shore of Frances Lake. Surface exploration, including blasting and trenching, coupled with drilling data showed that the principal zone consists of a northwest-trending, moderately (30 degrees) northeast-dipping quartz-siderite vein structure carrying heavy disseminated to massive galena, sphalerite, pyrite, and minor chalcopyrite. In surface exposures and trenches, massive sulphide lenses up to 24 inches wide occur; drill results have provided ore intersections carrying up to 20 ounces of silver per ton over 4.5 feet (Northern Miner, September 6, 1966 and October 20, 1966) but average values over mining widths (5 to 6 feet) are less than this (see Findlay, 1966, p. 64). The mineralization occurs in Paleozoic sedimentary rocks, chiefly argillite and siliceous argillite.

Results from the initial drilling program carried out in 1966 suggested that the vein structure might be broken into a number of roughly en echelon segments by a series of northeast-trending, left-lateral displacement faults. However, alternate interpretations of the drilling data were possible and following additional surface exploration (electromagnetic and geochemical surveys) during the 1968 field season additional drilling was carried out to further test the distribution and extent of mineralization. The principal objective of the new program was to determine the southeast strike extension of the mineralized zone. Between November 15 and December 20, 1968, 3 holes were completed to the southeast of the line of original drillholes. Two of the holes intersected ore-grade mineralization, extending the strike length of mineralization to about 900 feet. Assay results from the third (southeasternmost) hole of this series were reported as: 2.93 ounces per ton silver, 5.76 per cent lead, and 9.09 per cent zinc over a width of 6.4 feet (Northern Miner, December 14, 1968). Drilling was resumed in January, 1969 and a further 9 holes totalling about 4,270 feet were completed during the winter. Further work, including additional geophysical surveys and drilling is planned for 1969.

Logan Mountains

SPARTAN EXPLORATIONS LIMITED
303 - 1035 West Hastings Street,
Vancouver, British Columbia.

General Exploration
(about 61°38'N, 128°48'W
to 61°53'N, 129°20'W)

During 1968 Spartan Explorations Limited continued its 1967 exploration program in western Logan Mountains, northeast of the East Arm of Frances Lake and between McPherson and Anderson lakes. The 1968 operations were conducted from a base camp on Tillei Lake.

Following the initial work in the area in 1967 a total of 814 claims were staked in five groups (Lee, Thor East, Thor West, Zeus and Cree). The 1968 work involved follow-up investigations on a number of small tungsten (scheelite) and molybdenum showings discovered in 1967 as well as additional prospecting.

The area is underlain by the northern part of the Logan stock, a large batholithic granodiorite complex (unit 15, Blusson, 1966) that extends through the central part of the Frances Lake map-area into the Watson Lake area to the south. The granodiorite is fringed by Proterozoic metamorphic rocks (unit 2, op. cit.) that contain local skarn zones. In places, small pyrrhotite-pyrite lenses developed in skarn carry disseminated scheelite and minor chalcopyrite. Elsewhere in the area small molybdenite occurrences were found associated with younger porphyry stocks intruding granodiorite, some of which also contain minor scheelite. None of these occurrences have proved to be of economic interest.

PELLY PLATEAU AREA

Fortin Lake

PAY PROPERTY
Atlas Explorations Limited
330 - 355 Burrard Street,
Vancouver, British Columbia.

Zinc
(61° 59'N, 130° 30'W)

References: Wheeler, Green and Roddick (1960b); Findlay (1969, pp. 81-83).

During the 1968 field season Atlas Explorations Limited carried out a diamond drilling program to investigate zinc and lead-zinc geochemical anomalies outlined on its 265-claim Pay property in 1966 and 1967. The property lies adjacent to and immediately east of Fortin Lake in the extreme northeast corner of the Finlayson Lake map-sheet (105G). The claims were staked and optioned in several blocks during 1966 and 1967 following discovery of lead, zinc and gold-bearing arsenopyrite mineralization at several localities in the area, and on the basis of a regional reconnaissance geochemical survey carried out by the company in 1966.

Geological studies by company personnel have shown that the Pay property is underlain by various sedimentary rocks, including phyllite, limestone, dolomite, chert and shale that probably range in age from Middle and Upper Cambrian to Silurian-Devonian or younger (units 2 to 5, Wheeler, Green and Roddick, 1960b). The sedimentary rocks strike generally northwest and have apparently been open-folded and cut by two principal fault sets, one striking generally west to northwest, the other northerly.

In 1967 and 1968, exploration efforts were concentrated mainly on investigation of a strong linear zinc anomaly and nearby lead-zinc anomaly, which lies about 2 miles east of Fortin Lake. Bulldozer trenching and hand-pitting had exposed sparse mineralization near the eastern axis of the zinc anomaly where blue-grey silicified limestone or dolomitic limestone (Cambrian?), locally brecciated and impregnated with fine quartz-carbonate stockworks, carries replacement lenses of sphalerite with minor galena. During the 1968 drilling program 21 holes totalling 6,300 feet were drilled to test the anomaly, but results were not encouraging. Most of the holes intersected graphitic or limy phyllite with minor sections of the silicified host limestone unit but zinc and lead mineralization is generally sparse.

Fortin Lake

SPARTAN EXPLORATIONS LIMITED
303 - 1035 West Pender Street,
Vancouver, British Columbia.

General Exploration
(about 61°58'N, 130°30'W)

Late in the 1967 season Spartan Explorations Limited staked a total of 156 claims in two groups (Pal North and Pal South) along the northwest and southeast boundaries of the Atlas Explorations Limited Pay property. During 1968 the company conducted geochemical surveys over parts of the Pal claims. Certain of the Pal claims were subsequently allowed to lapse.

In the course of their work in the Fortin Lake area, reconnaissance geological mapping and soil sampling was carried out over the flat, overburden-covered area west of Fortin Lake. This work outlined an area of anomalous zinc geochemical values which was covered by the 24-claim Sun Group. The Sun claims lie about 8 miles southwest of Fortin Lake.

Itsi Lakes

SPARTAN EXPLORATIONS LIMITED
303 - 1035 West Hastings Street,
Vancouver, British Columbia.

General Exploration
(about 62°50'N, 130°00'W
to 63°10'N, 130°05'W)

Reference: Roddick and Green (1961b).

Working from a base camp at Fuller Lake, Spartan Explorations Limited carried out general exploration over an area between Itsi Lakes and Keele Peak. Geological mapping, prospecting and stream silt sampling were the principal exploration methods used, but in addition, more detailed geological and geochemical work was conducted on two claim groups - the Star Group (32 claims) located adjacent to and northeast of the Hudson Bay Mining and Development Company Limited Tom property (see below) and the Bee Group (16 claims) located about 4 miles southeast of Wilson Lake and about 8 miles east of Itsi Lakes. On the Star Group, a small lead-zinc occurrence was examined and sampled. The Bee Group was staked in 1968 to cover a previously-known pyrrhotite-chalcopyrite showing in skarn rocks along the contact between granodiorite (unit 11, Roddick and Green, 1961b) and Ordovician and Silurian sedimentary rocks (unit 3, op. cit.). The showing was not found to be of economic interest.

MACMILLAN PASS AREA

TOM PROPERTY
Hudson Bay Exploration and
Development Company Limited
Flin Flon, Manitoba.

Lead-Zinc
(63°10'N, 130°09'W)

References: Green (1965, pp. 47-48); Findlay (1969, pp. 85-87).

During the 1968 season Hudson Bay Exploration and Development Company Limited continued surface diamond drilling of its lead-zinc-silver deposit on the 144 claim Tom Group. Between mid-June and early September

a total of about 10,000 feet of drilling in 15 holes was completed. A crew of up to 22 men was employed on the project.

The Tom property is southeast of the North Canol Road and about 6 miles southwest of the Northwest Territories-Yukon Territory boundary. The property is accessible by a 2-mile road that leads from the Canol Road to the company camp on the property. A short (1,200 feet) airstrip near the Canol Road has been utilized in the past, but for the past two years company operations have been expedited from a floatplane-serviced base camp at Jeff Lake, 13 miles south of the property.

The original Tom showing was discovered in 1951 and between then and 1953, surface exploration and 17,834 feet of diamond drilling (36 holes) outlined an ore zone estimated to contain about 10.5 million tons averaging about 5 per cent zinc with some lead (Green, 1965, p. 47). Between 1953 and 1965 the property was idle. Surface exploration, including geochemical surveys and 5,500 feet of diamond drilling (10 holes) was resumed in 1967.

The deposit comprises two mineralized zones that are contained in argillaceous and chert-rich sedimentary rocks of uncertain age, but possibly Ordovician or Silurian (Green, 1965, p. 47). The discovery (west) zone lies at an elevation of about 5,500 feet, on the northeast side of a cirque valley containing a small, northwest-flowing tributary of South MacMillan River. It outcrops inconspicuously over a strike distance of about 200 feet as a buff to rust-coloured, well-laminated barite-rich carbonate bed containing disseminated galena and sphalerite. The carbonate zone and its enclosing sediments (finely-banded argillite and cherty argillite) trends northwest and dips moderately to steeply southwest. Drilling of the west zone has traced it discontinuously for a strike-distance of about 5,000 feet, but only the southern part of the zone contains ore-grade mineralization. The width of the zone ranges from less than 50 feet to about 125 feet.

The East mineralized zone lies uphill from the West zone and about 800 feet northeast of it. It is subparallel to the West zone, dips steeply, and has been traced for 800 feet along strike. The zone is generally thinner (10 to 60 feet) than the West zone but the grade is higher, in particular the silver content which locally reaches 10 ounces per ton. The 1968 drilling program was mainly designed to investigate the east zone from surface to an elevation of about 5,100 feet in preparation for future underground exploration work.

Sulphide mineralization in the Tom deposit varies from massive, fine-grained galena-sphalerite lenses to cherty argillite zones containing frequent thin galena-sphalerite laminations. Bands of massive sulphides up to 10 feet thick have been intersected in the East zone. In some ore sections and locally in the host rocks adjacent to mineralized zones, fine-grained pyrite is present. The mineral commonly forms massive bands in places within galena-sphalerite sections.

Coal River

KEY GROUP
Athabaska Columbia Mining Limited
1520 Alberni Street,
Vancouver 5, British Columbia.

Silver-Lead-Zinc
(61°30'N, 127°34.5'W)

Reference: Gabrielse, Roddick and Blusson (1965).

The 24-claim Key Group was explored by reconnaissance geological, geochemical and geophysical surveys during 1968. The claims lie about 4 miles north of the headwater area of Coal River and about a mile southwest of the Yukon Territory-Northwest Territories boundary. They cover an area underlain by the northwest-trending southwest contact between a Cretaceous(?) granodiorite intrusion (unit 35, Gabrielse, Roddick and Blusson, 1965) and Cambrian limy sedimentary rocks (unit 18, op. cit.).

Investigation of this contact zone during the 1968 season reportedly revealed the presence of several zones of minor galena-sphalerite mineralization developed in skarn patches in limestone. Geochemical and geophysical prospecting outlined the presence of several anomalous zones and further work is planned. The property was not visited.

HI GROUP
Hudson Bay Exploration and Development Company Limited
Flin Flon, Manitoba.

Tungsten
(62°47'N, 129°52'W)

The 48-claim Hi Group was staked in mid-1967 by prospectors employed by Hudson Bay Exploration and Development Company Limited following the discovery of low-grade tungsten mineralization. The claims lie west of the headwaters of Pelly River and about 10 miles southwest of Mount Wilson on the Yukon Territory-Northwest Territories border.

During the 1968 season the company carried out detailed mapping and sampling of the property. Tungsten mineralization (scheelite) is reported to occur with pyrrhotite and minor chalcopyrite in discontinuous skarn zones developed in limestone members of a (?)Devono-Mississippian shale-slate-argillite assemblage (unit 18, Blusson, 1966). The mineralization occurs in the vicinity of a small Cretaceous(?) granodiorite intrusion (unit 19, op. cit.). The property was not visited.

MACKENZIE (NORTHWEST TERRITORIES) AND MAYO MINING DISTRICTS

MacMILLAN PASS AREA

MACTUNG PROPERTY
American Metal Climax Incorporated
601 - 535 Thurlow Street,
Vancouver, British Columbia.

Tungsten
(63°17'N, 130°09'W)

References: Green and Godwin (1963, p. 19); Green (1965, pp. 48-50); Findlay (1969, p. 88); Cathro (1969).

American Metal Climax Incorporated holds a total of 70 claims (36 in Yukon Territory and 34 in Northwest Territories) covering a tungsten showing located about 5 miles northwest of MacMillan Pass. The showing was staked in 1962 by Southwest Potash Corporation, then a subsidiary of American Metal Climax Incorporated. Limited surface exploration was carried out in 1963 and 1964, following which the property was idle until 1967, when additional reconnaissance geochemical and geological mapping and prospecting was carried out.

During the 1968 season the company conducted a diamond drilling program (5 holes totalling about 4, 647 feet) to test the depth extension of tungsten mineralization. Due to the high altitude (6, 500-6, 700 feet) and permafrost conditions, drilling proved difficult and expensive and further work on the property is being held in abeyance pending evaluation of results to date.

The Mactung occurrence consists of disseminated pyrrhotite-scheelite mineralization in green diopside-wollastonite-garnet skarn bands formed in a sequence of (?)Cambrian sedimentary rocks near the contact with a small granodioritic stock of probable Cretaceous age. Two principal mineralized zones are present, both outcropping along the northeast wall of a cirque valley at elevations ranging from about 6, 100 feet to about 6, 700 feet. The discovery (lower) zone is up to 80 feet thick and is contained within an altered limestone member ('Sherwood Limestone') of the (?)Cambrian succession that also includes chert, phyllite, hornfels and argillite and that is estimated to have a total thickness of 1, 200 feet in the area (Cathro, 1969). The sedimentary rocks strike northwest and dip about 25 degrees southwest. The main zone is estimated to contain about 2 million tons grading about 0. 90 per cent WO_3. The second (upper) mineralized zone is up to 400 feet thick and lies within an impure limestone-skarn member, that is presumably stratigraphically above the lower 'Sherwood Limestone'. Mineralization in this zone is of lower grade and of more erratic distribution than the main zone, but because of its greater thickness it may have more significant economical potential.

Surface sampling, coupled with the 1968 drilling data indicates that mineralization is present over a strike length of about 3, 000 feet and over a downdip distance of about 1, 000 feet from the contact of the granodiorite intrusion (op. cit.).

NAHANNI MINING DISTRICT
DISTRICT OF MACKENZIE, NORTHWEST TERRITORIES

SELWYN MOUNTAINS AREA

Upper Flat River

CANADA TUNGSTEN MINING CORPORATION LIMITED
1620 - 101 Richmond Street W.,
Toronto, Ontario.

Tungsten-Copper
(61°57'N, 128°15'W)

References: Green and Roddick (1961); Brown (1961); Skinner (1961, pp. 42-46; 1962, pp. 41-43); Green and Godwin (1963, pp. 34-37; 1964, p. 48); White (1963, pp. 390-393; Green (1965, pp. 50-51; 1966, p. 85); Findlay (1967, pp. 68-69; 1969, pp. 89-90).

This company continued tungsten-copper production from its Cantung Mine located near the headwaters of Flat River, about 130 miles north of Watson Lake, Yukon. An all-weather road completed in late 1962 links the mine with the Watson Lake-Ross River road at about Mile 71 on the latter. The Cantung deposit was discovered in 1954 and has been in production since 1962, except for a period between September, 1963 and May, 1964

when the price of tungsten was depressed, and again during the period January-November, 1967 following a fire which destroyed the mill in late 1966.

The tungsten orebody lies in the floor of a small cirque at an elevation of 5,000 feet and is mined by open-cut methods. The townsite and mill, both located at an elevation of about 3,700 feet are connected to the mine by a 3-mile switchback haulage road. The ore deposit is a shallowly southwest-dipping lens about 300 feet wide and up to 65 feet thick that is contained mainly within a lower Cambrian 'ore limestone' member. A diopside-garnet-epidote skarn developed within the limestone hosts the ore. Ore occurs in two forms; as fine scheelite disseminated in a massive to heavily-disseminated pyrrhotite-chalcopyrite matrix; and, in coarse quartz-calcite-scheelite veins and lenses cutting the massive sulphides. Native bismuth is also present in the ores but is not recovered as a by-product.

From the start of production in 1962 to the end of 1967 about 464,121 tons of ore grading 2.35 to 2.85 per cent WO_3 and 0.4 to 0.45 per cent copper have been milled. In 1968, 131,000 tons of ore averaging 1.71 per cent WO_3 and 0.25 per cent copper were mined and 116,600 tons were milled to produce 179,246 STU* WO_3 and 645,000 pounds of copper. Latest published ore reserves (end, 1967) were 934,000 tons averaging 1.71 per cent WO_3 and 0.25 per cent copper (Northern Miner, April 11, 1968).

The new mill constructed at Cantung after the fire on 26 December, 1966 has a rated capacity of 350 tons per day but, if necessary, can operate in excess of this. Three types of concentrates are produced; a premium gravity scheelite concentrate containing 77 per cent WO_3; a scheelite-calcite concentrate that contains about 35 per cent WO_3 and that is further concentrated at the company leaching plant in Vancouver; and, a copper concentrate (27 per cent copper) that is shipped to a Japanese smelter. Because of severe climatic conditions encountered in the winter months at the mine site, mining is carried out only from May until late September or early October, but sufficient ore is stockpiled to allow 12-month operation of the mill. The operation employs about 85 persons in the summer months; in winter this is reduced to about 55.

PLACER MINING

DAWSON MINING DISTRICT

KLONDIKE AREA

THE YUKON CONSOLIDATED GOLD CORPORATION LIMITED
626 West Pender Street,
Vancouver, British Columbia.

References: Skinner (1961, pp. 6-9; 1962, pp. 5-8); Green and Godwin (1963, pp. 41-44; 1964, pp. 50-53); Green (1965, pp. 52-57; 1966, pp. 86-89); Findlay (1967, pp. 69-72; 1969, pp. 91-92).

The Yukon Consolidated Gold Corporation Limited continues to hold 235 placer claims in the Klondike area, 229 of which are leased to other individual placer operators. The company's gold dredging operations in the

* STU = short ton unit = 20 lbs.

Klondike were terminated in late 1966 following which extensive investments were made in other mining properties elsewhere in Canada, including a major share (with Rio Algom Mines Limited) in Lornex Mining Corporation.

BALLARAT MINES LIMITED
Dawson, Yukon Territory.

References: Skinner (1961, p. 10; 1962, p. 10); Green and Godwin (1963, pp. 47-48; 1964, pp. 53-56); Schmidt (1964); Green (1965, pp. 56-57; 1966, pp. 89-91); Findlay (1967, pp. 72-73; 1969, pp. 92-93).

This company, owned by Mr. and Mrs. H.H. Schmidt of Dawson, continued as the largest placer producer in Yukon in 1968. Bulldozer sluicing plants operated on Dominion Creek and Quartz Creek produced a total of 1,759 ounces of crude gold from 80,000 cubic yards of material. Sluiced mining in 1968 required stripping of a total of 130,000 cubic yards of material. A crew of five men, including owner-manager H.H. Schmidt was employed.

The company holdings on Dominion Creek (63°49'N, 138°39'W) include two owned claims and 60 contiguous leased claims extending downstream from the mouth of Caribou Creek to the adjacent property of the Yukon Consolidated Gold Corporation Limited. Production from Dominion Creek operations in 1968 was about 968 ounces of crude gold. On Quartz Creek (63°47'N, 139°06'W) mining has been carried out for the past three years on ground containing a White Channel gravel section upstream from the mouth of Calder Creek. Experiments involving a bulldozer-mounted conveyor-belt system and an elevated mobile sluicing plant have been carried out on the Quartz Creek operation over the past two years. Production from Quartz Creek in 1968 was about 791 ounces of crude gold.

Bonanza Creek

A. T. Fry (63°37'N, 139°22'W)
Dawson, Yukon Territory.

References: Green (1966, pp. 94-95); Findlay (1967, p. 75; 1969, p. 75).

A. T. Fry holds claims 32 Below Discovery on Bonanza Creek and leases claims 20, 21, 27, 30 and 36 Below from the Yukon Consolidated Gold Corporation Limited. In addition, Fry holds hill claims opposite 30 and 31 Below on Bonanza Creek, on the right limit of Boulder Creek opposite claim 2 Above, and two claims on either side of Monte Cristo Gulch. Fry also owns two right limit bench claims opposite 50 and 51 Below, Bonanza Creek as well as five claims on Eldorado Creek worked in 1967 by F. Chudy (see Findlay, 1969, p. 98).

Mr. and Mrs. Fry mined mainly on claim 28 Below, Bonanza Creek during 1968. In addition two cuts were put in on the bench claims opposite 50 and 51 Below and late in the season some stripping on claim 3 Above, Eldorado Creek was done to prepare ground for next year. Production from 1968 operations was 127 ounces of crude gold.

J. and R. Archibald (63°58'N, 139°21'W)
Dawson, Yukon Territory.

Reference: Findlay (1969, p. 96).

J. and R. Archibald lease claims 37, 38, 39 and 40 Below on Bonanza Creek from R.S. Troberg of Dawson. In 1968, their third year of operation on this property, the Archibald brothers mined a right limit cut downstream from the mouth of Mosquito Gulch and an extension of last year's workings. Production was about 105 ounces of crude gold from about 10,000 bedrock square feet sluiced. The average depth of the 1968 cut was about 6 feet. Mining is carried out with a monitor and pump system aided by a TD-40 tractor.

H. C. and D. F. Boutillier (63°55'N, 139°21'W)
Dawson, Yukon Territory.

References: Skinner (1961, p. 9; 1962, pp. 9-10); Green and Godwin (1963, p. 46; 1964, p. 57); Green (1965, p. 58; 1966, p. 95); Findlay (1967, p. 75; 1969, pp. 95-96).

H. C. and D. F. Boutillier own 11 creek claims on Adams Creek and two bench claims on Adams Hill about 8 miles upstream on the left limit of Bonanza Creek. In previous years the owners have operated a hydraulic plant on Adams Hill but mining here was completed in 1966 and in 1967 and 1968 mining was carried out on Adams Creek only. During the 1967 season a total of 122 ounces of crude gold, mainly jewelry grade, was produced from three cuts totalling about 15,000 bedrock square feet on claims 7 and 13 Above. In 1968 the Boutillier brothers mined only part of the season (see also p. 114) and recovered 52 ounces of crude gold from a single cut exposing about 6,000 square feet of bedrock on claim 9 Above. Mining is done with a bulldozer-sluicing plant using a TD-40 tractor.

Victoria Gulch
(Tributary of Upper Bonanza Creek)

F. Perret (63°55'N, 139°12'W)
Dawson, Yukon Territory.

References: Skinner (1962, p. 10); Green and Godwin (1963, p. 47; 1964, p. 58); Green (1965, p. 59; 1966, p. 96); Findlay (1967, p. 76; 1969, p. 97).

F. Perret mined on claim 44 Above, Victoria Gulch during 1968. A centre cut about 150 feet long by 30 feet wide was completed and about 22 ounces of crude gold recovered. Perret now considers Victoria Gulch to be mined out and next season he plans to transfer his operations to Bonanza Creek where he owns claims 30, 37 and 39 Above. For the past two seasons an automatic trip-gate has been utilized on this ground for stripping operations on claim 39 Above.

Eldorado Creek

Franklin Enterprises Limited (63°52'N, 139°15'W)
Dawson, Yukon Territory.

References: Green (1966, pp. 89-90); Findlay (1967, pp. 73-74; 1969, pp. 97-98).

This company, owned by G.D. Franklin of Kennewick, Washington completed mining on its Eldorado Creek ground in 1968. Franklin, formerly a partner with H.H. Schmidt, has operated a bulldozer-sluicing plant on Eldorado Creek since 1961. Until 1966 the operation was conducted in the name of Ballarat Mines Limited; subsequent to this Franklin Enterprises Limited acquired the Eldorado Creek workings. In 1968 the company held claims 28, 29, 30, 31 and 43-0A on Eldorado Creek.

Mining during 1968 was carried out from a series of shallow left limit cuts on claims 27, 28 and 29 Above. Production was about 1,500 ounces. Franklin was assisted for part of the 1968 season by H.C. and D.F. Boutillier (see also p. 112).

Hunker Creek

P. Brady (63°56'N, 138°53.5'W)
Dawson, Yukon Territory.

References: Green (1966, p. 97); Findlay (1967, p. 76; 1969, p. 99).

P. Brady continued hand mining on claim 30 Above, Hunker Creek, about 75 feet above last year's left limit cut. Brady's tools are a shovel, wheelbarrow and rocker, and the upper Hunker Creek gravels on his ground still contain good coarse gold, although its distribution is erratic. Production from 1968 operations was about 9 ounces of crude gold.

Last Chance Creek
(Tributary of Hunker Creek)

J. and I.C. Bremner (64°00'N, 139°07'W)
Dawson, Yukon Territory.

References: Skinner (1961, p. 10; 1962, pp. 10-11); Green and Godwin (1963, p. 48; 1964, p. 59); Green (1965, p. 59; 1966, pp. 97-98); Findlay (1967, pp. 76-77; 1969, p. 99).

J. and I.C. Bremner own 29 bench and hill claims on Lower Last Chance Creek, a main tributary of lower Hunker Creek. In 1968 the Bremners were late in returning to their workings and consequently did not sluice during the spring run-off. From about mid-June until mid-September, I.C. Bremner mined in a small cut (about 3,000 bedrock square feet) in White Channel gravels about 200 feet downstream from last year's cut on Discovery Hill. The depth of the 1968 cut is about 25 feet. Bedrock in this area is not the typical

Klondike schist, but is a deeply-weathered, banded sedimentary assemblage consisting of siltstone, fine sandstone and probably impure limy beds. Production in 1968 was about 48 ounces.

Gold Bottom Creek
(Tributary of Hunker Creek)

O. Lunde (63°55'N, 138°59'W)
Dawson, Yukon Territory.

References: Skinner (1961, p. 12; 1962, pp. 11-12); Green and Godwin (1963, pp. 49-50; 1964, p. 60); Green (1965, p. 60); 1966, pp. 98-99); Findlay (1967, p. 77; 1969, pp. 99-100).

O. Lunde holds claims 8 to 17 above the mouth of Gold Bottom Creek, a main tributary of Hunker Creek that rises on the northwest slopes of King Solomon Dome. In 1968 Lunde mined from four shallow cuts totalling about 45,000 bedrock square feet, on claims 12 and 13 Above. The 1968 workings are about 800 feet upstream from last year's workings on claim 11. Production in 1968 was about 267 ounces of crude gold.

M. Crockett and B. Bratsberg (63°54'N, 138°59'W)
Dawson, Yukon Territory.

References: Skinner (1961, p. 10; 1962, pp. 11-12); Green and Godwin (1963, p. 50; 1964, pp. 60-61); Green (1965, p. 60; 1966, p. 99); Findlay (1967, p. 77; 1969, p. 100).

Until mid-1967 B. Bratsberg owned claims 29 to 38 above the mouth on Gold Bottom Creek, as well as the upper 500 feet of Discovery claim. In August, 1967 M. Crockett acquired these claims from Bratsberg and since then, with the latter's part-time help has been operating a bulldozer-sluicing plant on the creek. In 1968 mining was carried out on claims 32 and 33 from four cuts totalling about 50,000 bedrock square feet. Production was about 306 ounces of crude gold from about 33,000 cubic yards of material sluiced. Equipment used in the operation includes a D-8 bulldozer.

Dominion Creek

A. and N. Burgelman (63°49'N, 138°49'W)
Dawson, Yukon Territory.

References: Skinner (1961, p. 11; 1962, p. 12); Green and Godwin (1963, p. 52; 1964, pp. 61-62); Green (1965, p. 61; 1966, p. 100); Findlay (1967, p. 77; 1969, p. 100).

Mr. and Mrs. Burgelman continued mining in 1968 on the right limit of Dominion Creek where they own claims 117 to 122 and 130, 131A, 131B and 132 Below. Mining was carried out on claim 118 Below where cuts totalling 22,500 bedrock square feet yielded about 254 ounces of crude gold.

I. Norback (63° 47.8'N, 138° 36.2'W)
Dawson, Yukon Territory.

References: Findlay (1969, p. 101).

I. Norback leases claims 71, 72, 73, 74 and 75 Below Lower Discovery from the Yukon Consolidated Gold Corporation Limited. In addition, he owns claim 77 Below Lower Discovery near the mouth of Nevada Creek and holds a prospecting lease covering ground formerly held by the Yukon Consolidated Gold Corporation Limited as claims 143 to 150 Below Lower Discovery.

During the 1968 season Norback mined about 37,000 bedrock square feet from a left limit bench upstream from last year's cut on claims 74 and 75 Below. The 1968 workings were on claim 75 Below. Depth of cut ranged from 6 to 7 feet at the lower end to about 20 feet at the upper end. Production for 1968 was about 191 ounces of crude gold.

Gold Run Creek
(Tributary of Dominion Creek)

Gold Run Placers Limited (63° 43.5'N, 138° 41'W)
Dawson, Yukon Territory.

References: Green and Godwin (1963, pp. 51-52; 1964, pp. 62-63); Green (1965, p. 62; 1966, pp. 100-101); Findlay (1967, p. 78; 1969, p. 101).

Gold Run Placers Limited, owned and operated by J. Lamontagne and E. Schink, leases claims 36 to 51 on Gold Run Creek from the Yukon Consolidated Gold Corporation Limited. The property is accessible from the Dominion Creek road by a 3-mile road along the east side of Gold Run Creek. The present operators began mining this ground in 1962 and total production for the period 1962-1967 was about 6,040 ounces of crude gold. In 1968 production was about 1,019 ounces of crude gold, recovered from nine right limit cuts totalling about 150,000 bedrock square feet. Average depth of cuts was about 22-23 feet. Mining was carried out on claims 37, 38 and the lower part of 39. Equipment includes two D-6 bulldozers.

Consolidated Mines (Yukon) Limited (63° 42'N, 138° 36'W)
Dawson, Yukon Territory.

Reference: Findlay (1969, pp. 101-102).

Consolidated Mines (Yukon) Limited, owned by L. M. Ross and T. Matson, leases claims 8 to 32 Above on lower Gold Run Creek. After completing a major 4,500-foot drainage ditch on the property, begun last year, Ross and Matson mined a total of about 60,000 bedrock square feet on claim 12C and produced about 1,244 ounces of crude gold. The area being mined includes a section of White Channel gravels about 7 feet thick and average depth of mining is about 20 feet. Mining is done using two D-8 bulldozers to push material into the sluiceboxes and a Bucyrus Erie 37-B dragline to remove tailings.

Quartz Creek

A. Sailer (63° 47'N, 139° 06'W)
Dawson, Yukon Territory.

References: Green (1965, p. 62; 1966, p. 102); Findlay (1967, p. 79; 1969, p. 102).

In 1968, A. Sailer continued mining on right limit hill claim 27, leased from O. Lunde. A cut totalling about 25,000 bedrock square feet was mined about 200 feet upstream from last year's workings. The White Channel gravel bed averaged about 5 feet in thickness in this area and required removal of up to 15 feet of overlying sand, silt and mud prior to mining. Production in 1968 was about 320 ounces of crude gold.

Ballarat Mines Limited

Quartz Creek operations are described in the general report on the company.

A. Sundt (63° 50'N, 139° 02'W)
Gakona, Alaska.

References: Skinner (1962, p. 14); Green and Godwin (1963, pp. 53-54; 1964, p. 63); Green (1965, p. 62).

A. Sundt owns eight claims on Quartz Creek. Prior to 1965 Sundt operated a bulldozer-sluicing plant on the property and during the period 1962-1965 recovered a total of about 1,060 ounces of crude gold. In 1966 and 1967 the property was idle except for minor ground preparation work. In 1968 Sundt, with the help of B. Bratsberg recovered about 56 ounces of crude gold from a small cut totalling about 7,500 bedrock square feet on claim 2 Below Amax discovery. Sundt and Bratsberg mined for only a short time during the 1968 season.

Allgold Creek
(Tributary of Flat Creek)

K and S Placers (63° 56'N, 138° 37.5'W)
Whitehorse, Yukon Territory.

References: Skinner (1962, p. 14); Green and Godwin (1963, p. 56; 1964, p. 66); Green (1965, pp. 63-64; 1966, pp. 103-104); Findlay (1967, p. 79; 1969, p. 103).

K and S Placers, owned by M. Kinakin, Whitehorse, leases Discovery claim and claims 1 to 10 Above on Allgold Creek from Consolidated Brewis Minerals Limited. In addition, claims 11 to 30 Above are owned by Kinakin. The property is reached by a short access road that leaves the Dawson-Stewart Crossing road at the abandoned settlement of Flat Creek. The company operated a bulldozer-sluicing plant on the property from 1961 to 1966,

with total production for this period being about 4,242 ounces of crude gold. In 1967 no mining was carried out, but some stripping and ground preparation was done for future work. Mining was resumed on a part time basis in 1968 and production recorded was about 38 ounces of crude gold. Stripping in preparation for future mining was done on claims 11 and 12 Above and additional work was done on claims 7 and 8.

SIXTYMILE AREA

Miller Creek

O. and D. Medby (64° 00'N, 140° 47'W)
Dawson, Yukon Territory.

References: Green and Godwin (1964, pp. 69-71); Green (1965, pp. 66-67; 1966, p. 108); Findlay (1967, p. 80; 1969, p. 104).

In 1968 O. Medby transferred his operations from Sixtymile River where he has mined since 1962, to Miller Creek where he and D. Medby hold Discovery claim and six other claims. In 1968 Medby put in a left limit bench prospect cut totalling about 2,500 bedrock square feet about 2.2 miles upstream from the mouth of Miller Creek (at Sixtymile River). Production was about 30 ounces of crude gold.

Glacier Creek

Glacier Placers (64° 02.2'N, 140° 49'W)
Dawson, Yukon Territory.

Reference: Findlay (1969, p. 104).

Glacier Placers, owned by M.G. Grenier, E. Foucher and L. Guimard hold 15 claims on Glacier Creek, starting at a point about 1/2 mile upstream from Glacier Creek P.O. (abandoned). Most of the 1968 season was spent stripping and preparing ground for next season; however late in the season a centre cut totalling about 21,000 bedrock square feet was mined on claim 12 Below, just downstream from the present camp. Average depth of the cut was about 16 feet and production recorded was about 257 ounces of crude gold.

J. Lynch (64° 02'N, 140° 53'W)
Dawson, Yukon Territory.

References: Green (1965, p. 67); Findlay (1969, p. 105).

J. Lynch holds claims 8 Below to 1 Above and part of 2 Above on Glacier Creek as well as Discovery claim and 1 and 2 Above on Big Gold Creek. For the past four seasons Lynch has operated a bulldozer-sluicing plant on his Glacier Creek ground. In 1968 Lynch, working alone, mined a total of about 10,000 bedrock square feet from a right limit cut on claim 8 Above, just upstream from last year's workings. Production was about 300 ounces of crude gold.

KIRKMAN CREEK-STEWART RIVER AREA

Brewer Creek

K. Djukastein (63°11'N, 139°00'W)
Mayo, Yukon Territory.

References: Green (1965, p. 68; 1966, p. 109); Findlay (1967, p. 81; 1969, p. 105).

K. Djukastein completed his fifth season of mining on Brewer Creek, a left limit tributary of Stewart River, about 3 miles downstream from Barker Creek. In 1968, working on Discovery claim, Djukastein mined about 15,000 bedrock square feet and produced about 201 ounces of crude gold. The property was not visited.

MAYO MINING DISTRICT

HAGGART CREEK AND DUBLIN GULCH AREA

Haggart Creek

Spruce Creek Placers Limited (64°01'N, 135°51'W)
Mayo, Yukon Territory.

References: Skinner (1961, p. 15; 1962, p. 18); Green and Godwin (1963, pp. 57-58; 1964, pp. 74-75); Green (1965, pp. 70-72; 1966, pp. 110-112); Findlay (1967, pp. 82-83; 1969, p. 106).

This company, owned by J. M. Acheson, F. M. Wilson and W. L. Drury, holds a 22-claim lease from the E. H. Barker estate on Haggart Creek, between Dublin Gulch and Fifteen Pup. The company also holds 1-mile and 3-mile left limit prospecting leases downstream from Dublin Gulch and Fifteen Pup, respectively. Access to the property is by a 25-mile road from about Mile 268 (South McQuesten Road) on the Mayo-Elsa road.

Spruce Creek Placers Limited has mined this ground since 1953, except for the period 1958-1961 using bulldozer-sluicing methods. Cumulative production to the end of the 1967 season was about 20,000 ounces of crude gold; however most of the 1967 season was spent in excavating a 4,000-foot drainage ditch to new ground and little mining was done.

During 1968, fulltime mining was resumed in a deep left-limit channel above the intake of the drainage ditch on claim 5 Below. Between September, 1967 (when mining was resumed) and October, 1968 a series of cuts totalling 1,300 feet in length and averaging 88 feet in width were mined in this area. The 1968 work involved stripping of about 15,400 cubic yards of material and sluicing of 58,340 cubic yards for a total production of about 824 ounces of crude gold. In addition 125,000 cubic yards of material were stripped in preparation of new ground and to provide room for extension of the drainage ditch. A crew of three men was employed in the operation, including manager J. Acheson. Equipment used was a 1 1/2 yard dragline, two D-8 bulldozers and one D-7E bulldozer equipped with ripper.

Dublin Gulch

F. Taylor (64° 02'N, 135° 50'W)
Mayo, Yukon Territory.

References: Skinner (1961, p. 14; 1962, p. 17); Green and Godwin (1963, pp. 59-60; 1964, pp. 76-77); Green (1965, pp. 72-73; 1966, pp. 112-113); Findlay (1967, p. 83; 1969, p. 107).

F. Taylor owns seven claims extending upstream from the mouth of Dublin Gulch and accessible by a rough road leading up the north side of the Gulch about 1 mile past the camp of Spruce Creek Placers Limited.

Taylor has mined the Dublin Gulch property intermittently since 1937. Cumulative production to the end of 1967 was about 9, 930 ounces of crude gold and 10 tons of tungsten (scheelite) concentrate. During 1968 Taylor, working with one part time helper, mined a left limit cut on claim 3 Above totalling about 27, 000 bedrock square feet. Production was about 484 ounces of crude gold. The 1968 cut begins opposite the upper end of last year's right limit cut and extends upstream to about the mouth of Suttle's Pup. The pay gravel in this area is poorly-sorted and is tightly bound with a gummy sericite-rich matrix, making sluicing more difficult than usual.

G. Smashnuk (64° 02'N, 135° 49.5'W)
Mayo, Yukon Territory.

References: Skinner (1961, p. 14; 1962, p. 17); Green and Godwin (1963, pp. 58-59).

G. Smashnuk owns claims 5 to 9 Above on Dublin Gulch, upstream from F. Taylor's property and extending from Eagle Pup up to Stewart Pup. Smashnuk worked this ground from 1960 to 1962 inclusive during which period he recovered a total of about 826 ounces of crude gold. The property was inactive from 1963 to 1967, except for some prospect mining done by Smashnuk in 1964. Smashnuk resumed mining during the 1968 season and a left limit cut totalling about 4, 000 bedrock square feet was put in opposite the mouth of Eagle Pup.

HIGHET CREEK AREA

Highet Creek

E.C. Bleiler (63° 45.5'N, 136° 09'W)
Mayo, Yukon Territory.

References: Skinner (1961, pp. 15-16; 1962, p. 19); Green and Godwin (1963, pp. 60-61; 1964, pp. 78-79); Green (1965, pp. 73-76; 1966, pp. 113-114); Findlay (1967, pp. 83-84; 1969, p. 108).

E.C. Bleiler holds 34 placer claims on Highet Creek, a main tributary of Minto Creek. The property is accessible from the Highet-Johnson Creek road that leaves the Minto Lake road about 12 miles west of the Mayo-Elsa road. Bleiler's current workings are 4.9 miles up from the junction of the Minto Lake and Highet Creek roads.

During 1968 Bleiler, working with his son, mined about 25,200 cubic yards from three cuts totalling about 27,000 bedrock square feet and with an average depth of 25 feet. Production was about 407 ounces of crude gold. Ground mined during 1968 was not as productive as last year (1,098 ounces) and extremely low water conditions in Highet Creek further hampered mining. The centre part of the ground currently being mined, near the mouth of 80 Pup, has been hand mined in past years and contains the remains of underground workings. Left limit ground in this area is of unknown extent and will be investigated in the future.

On this property, stripping and mining are accomplished by a monitor system using water routed through a ditch that taps Highet Creek further upstream. A 955K traxcavator is used to stack tailings.

W. and J. Gordon (63°44'N, 136°07.5'W)
Mayo, Yukon Territory.

Reference: Findlay (1967, p. 84; 1969, pp. 108-109).

Mr. and Mrs. W. Gordon of Mayo hold a 1-mile placer lease and two placer claims on Highet Creek, about 2 miles above the mouth of Bennett Creek. Access is gained by the Highet Creek-Johnson Creek road.

During 1968 Gordon continued part time prospect mining on a right limit bench above Highet Creek. The section here consists of quartz-sericite schist bedrock overlain by a thin zone of poorly-sorted, subangular gravel, in turn overlain by about 25 feet of well-sorted, cobble-sized gravel with a sandy matrix. Capping this is 3 to 4 feet of sandy subsoil. Prospect work has shown that the gold-bearing zone occurs about 20 feet above bedrock rather than near or on bedrock as is more commonly the case. Production from 1968 operations was 4 ounces of crude gold.

SOURDOUGH HILL AREA

Thunder Gulch

Barduson Placers Limited (63°54.5'N, 135°15'W)
Mayo, Yukon Territory.

Reference: Findlay (1969, pp. 111-112).

H. Barchen, owner and operator of Barduson Placers Limited holds eight claims on Thunder Gulch, a tributary of Lightning Creek on the northwest flank of Sourdough Hill. The property is accessible by a road that leaves the Keno City-Keno Hill road, crosses Lightning Creek, and continues east along the south side of Lightning Creek valley past Thunder Gulch mouth.

Barchen started mining on Thunder Gulch in mid-1967, with two cuts totalling about 11,000 bedrock square feet. In 1968 he mined from a right limit cut located opposite last year's cuts and totalling 15,000 bedrock square feet and averaging 16 feet deep. Production was about 300 ounces, over half of it jewelry grade.

The gravel in Thunder Gulch is coarse and poorly-sorted and locally contains much sliderock as well as nests of large boulders. The gradient of the creek is fairly steep and the valley is narrow and allows little room

for maneuvering during mining. Gold-bearing gravel extends beneath a hardpan layer 3 to 4 feet above bedrock and 2 to 3 feet of bedrock is mined in a cut. Much of the gold is coarse. Bedrock is dominantly quartz-sericite schist with intercalated quartzitic layers. Near the upper end of the 1968 cut a peculiar jellyish, water-saturated 'sand' was encountered which proved difficult to excavate with the bulldozer and which had some characteristics of deeply-weathered bedrock. Eventually, further excavation showed the material to be a false bedrock and it seems probable that it is a buried silt-bar of a former, shallower creek channel or a highly compacted, buried mudflow.

WHITEHORSE MINING DISTRICT

KLUANE LAKE AREA

Burwash Creek

BURWASH MINING COMPANY LIMITED (61°22.5'N, 139°17'W)
Burwash Landing, Yukon Territory.

References: Cairnes (1915, pp. 22-24; in Bostock, 1957, pp. 367-371); Skinner (1961, pp. 17-18; 1962, pp. 20-21); Green and Godwin (1963, p. 63; 1964, pp. 82-83); Green (1965, p. 80; 1966, pp. 120-121); Findlay (1967, pp. 86-87; 1969, pp. 112-113).

Burwash Mining Company Limited, owned and operated by H. Besner, holds 22 claims on Burwash Creek, a tributary of Kluane River. The property is reached by a rough secondary road about 6 miles long that leaves the Alaska Highway at Mile 1104.

Besner has mined on Burwash Creek since 1945, working from near Burwash Canyon upstream past the mouth of Tetamagouche Creek, a distance of slightly over 4 miles. Cumulative production from 1945 to 1967 inclusive was about 23,515 ounces of crude gold, but this figure does not include considerable jewelry grade gold that has been recovered, including two large nuggets, one weighing 15 1/2 ounces, the other 9 1/4 ounces, that were found in 1966.

In 1968, Besner, working with two helpers mined a centre cut 700 feet long by about 40 feet wide on Burwash Creek upstream from last year's workings. As was the case last year, mining continued in virgin ground; however the pay zone was locally as narrow as 8 feet. Bedrock in this area is peridotite, part of an ultramafic intrusion that extends west of Burwash Creek, just south of Tatamagouche Creek. Depth to bedrock is 8 to 15 feet and actual mining is done with a Bucyrus Erie 22-B 3/4 yard diesel shovel. Tailings are removed with a D-8 and D-7 bulldozer. Recorded production for 1968 was about 342 ounces of crude gold.

Bullion Creek

H. Thorsen (about 60°58.5'N, 138°39'W)

References: Skinner (1961, p. 17; 1962, p. 21); Green and Godwin (1963, pp. 62-63); Findlay (1967, p. 87; 1969, p. 113).

H. Thorsen holds nine claims on lower Bullion Creek below the mouth of Wolf Creek. The property is reached by a 7-mile access road that leaves the Alaska Highway at Sheep Mountain (Mile 1061) and fords lower Sheep Creek before continuing up Bullion Creek. Thorsen's camp and workings are about 1.6 miles upstream from the mouth of Bullion Canyon where the creek flows into Slims River flats.

Over the past three seasons Thorsen has mined a series of right limit cuts that extend upstream from the camp for about 500 feet. The average width of the cuts is 20 to 30 feet and depth is 10 to 12 feet, including about 2 feet of bedrock. Production recorded in 1968 was about 110 ounces.

CARMACKS AREA

Revenue Creek

N.A. Warvalle (62°21'N, 137°16'W)
Dawson, Yukon Territory.

N.A. Warvalle holds 14 claims on Revenue Creek, a north-flowing tributary of Big Creek about 7 miles northwest of Freegold Mountain. Gold was originally discovered in Revenue Creek gravels by P.F. Guder of Carmacks who has done intermittent hand mining and prospect-pitting in past years. During 1968 Warvalle stripped ground on the right limit of claim 3 up from the junction with Big Creek, and in the latter part of the season commenced mining. Production was 7 ounces of crude gold. Equipment includes a D-4 bulldozer.

COAL MINING AND EXPLORATION

WHITEHORSE MINING DISTRICT

CARMACKS AREA

TANTALUS BUTTE MINE
Anvil Mining Corporation Limited — Coal
Box 2470, (62°08'N, 136°16'W)
Whitehorse, Yukon Territory.

References: Bostock (1936a, pp. 59-62); Wheeler (1961, p. 74); Green (1966, pp. 121-122); Findlay (1967, p. 88; 1969, p. 114).

The Tantalus Butte Mine at Carmacks was operated by the Yukon Coal Company Limited (a subsidiary of Cassiar Asbestos Corporation Limited and United Keno Hill Mines Limited) until mid-1967 to supply heating fuel for the United Keno Hill Mines Limited operations at Elsa, Yukon Territory. Following conversion of heating machinery to oil-fired units at Elsa the mine was closed and during 1968 no production was recorded.

In 1968, Anvil Mining Corporation Limited entered into negotiations to purchase the mine to supply heating fuel for the mill at its large Faro lead-zinc mine 100 miles east of Carmacks. The mine is scheduled to reopen in mid-1969 for this purpose. Production at a rate of about 20,000 tons per year

is scheduled, a significant increase over former annual production which ranged from about 9,000 tons to 3,000 tons in recent years.

The Tantalus Butte coal is of the high-volatile Bituminous variety. It occurs in the Tantalus Formation, which contains conglomerate with subordinate sandstone and shale as well as a few coal seams (Bostock, 1936a, p. 28). Wheeler (1961, p. 74) considered the Tantalus Formation to be of Upper Jurassic(?) and Lower Cretaceous age. In the Tantalus Mine the main coal seam ranges in thickness from 8 to 20 feet, strikes about north-northwest and dips 50-55 degrees southwest. It has been mined by room-and-pillar methods from a main entry that follows the seam for about 2,600 feet from a portal at an elevation of 2,056 feet, about 350 feet above Yukon River.

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