Minister of Mines and Petroleum Resources

PROVINCE OF BRITISH COLUMBIA

ANNUAL REPORT

for the Year Ended December 31

1967

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1968

BRITISH COLUMBIA DEPARTMENT OF MINES AND PETROLEUM RESOURCES

VICTORIA, B.C.

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V.C., P.C., C.C., C.B., D.S.O., M.C., C.D.,
Lieutenant-Governor of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The Annual Report of the Mineral Industry of the Province for the year 1967 is herewith respectfully submitted.

DONALD L. BROTHERS,
Minister of Mines and Petroleum Resources.

Minister of Mines and Petroleum Resources Office,
March 31, 1968.

Robert James Craig, Senior Inspector, Environmental Control, died in Vancouver on December 12, 1967, after a short illness. He was born in Vancouver on July 1, 1913, and it was here he received his engineering education, graduating from the University of British Columbia with a B.A. and a B.A.Sc. in mining engineering. He served on the engineering staff of the Britannia mine from 1936 to 1945, when he joined the Workmen's Compensation Board as an Inspector, silicosis branch. He was transferred to the Department in 1962 as a Senior Inspector with office in Vancouver. "Bob" Craig was hghly respected throughout the mining industry for his knowledge of ventilation and dust control. He was intimately aware of the problems of environmental control which had to be solved to improve working conditions, and his advice was widely sought. He was a member of the Association of Professional Engineers of British Columbia and the Canadian Institute of Mining and Metallurgy. He is survived by his wife Alice, two daughters, and a son.

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ANNUAL REPORT OF THE MINISTER OF MINES AND PETROLEUM RESOURCES, 1967

Introduction

An annual report of the mineral industry of the Province has been published each year since 1874. From 1874 to 1959 it was the Annual Report of the Minister of Mines, and since 1960 it has been the Annual Report of the Minister of Mines and Petroleum Resources. It is the official document in which each year is recorded the salient facts of activity of the industry.

The Annual Report of the Minister of Mines and Petroleum Resources contains sections dealing with Statistics; Departmental Work; Lode Metals; Placer; Structural Materials and Industrial Minerals; Petroleum and Natural Gas; Inspection of Mines; and Coal.

There is a general introductory review of the mineral industry as a whole, as well as somewhat more detailed reviews of mining and exploration and of petroleum and natural gas.

The section on Statistics records the mineral production of the Province in all its phases and in considerable detail. Current and past practice in arriving at quantities and in calculating the value of the various products is outlined.

The organization of the Department and the work of its various branches are outlined briefly in the section on Departmental Work.

The Lode Metals section records details of individual mining operations, as well as the exploration and development of mineral deposits. Information is provided on every metal-producing mine in the Province, and an attempt is made to record the progress of exploration and development work on most of the important, newly discovered and recently explored mineral deposits. In some instances a mining property is described in considerable detail, with special attention given to the history of past work, to a description of the workings, the geological setting, and to the mineral deposit itself. Some geological reports are of areas where one or more mineral deposits occur. These geological reports provide the basic information about the mineral resources of the Province that is essential to intelligent resource planning.

The declining phase of the once important placer-mining industry continues to be recorded in the Placer section.

Information on occurrences and production of Structural Materials and Industrial Minerals is recorded in a separate section.

The Petroleum and Natural Gas section records in considerable detail the development and production statistics of that expanding industry.

Information concerning mine safety, fatal accidents, dangerous occurrences, etc., and the activities of the Inspection Branch of the Department is contained in the section on Inspection of Mines.

The section on Coal contains information on operating coal mines and on exploration activities.

Review of the Mineral Industry

By M. S. Hedley

The year 1967 was a good one for British Columbia's mineral industry. For the sixth successive time a new record was set for the value of annual production. The total of $386,796,807 was 14 per cent above the previous record set in 1966, and brought the all-time total value to $6,297 million.

A record value was set in each of the four categories of metals, industrial minerals, structural materials, and fuels. The comparison with 1966 follows:—

	1966	1967	Gain (Per Cent)
Metals	$209,036,531	$235,932,026	12.9
Industrial minerals	22,865,324	29,364,065	28.4
Structural materials	46,821,264	47,359,089	1.1
Fuels	60,470,406	74,141,627	22.6
Totals	$339,193,525	$386,796,807	14.0

The most valuable single commodity was copper, and the second was crude oil; the value and quantity of each were at unprecedented high levels.

The increase in the metals category was due to a greatly increased output of copper, resulting from new mines and increased milling rates. Production was 63.2 per cent above that for 1966, but, because of a lower average price, the value was up only 57.1 per cent. The quantities and values of molybdenum, nickel, and silver were up, but lead and zinc were both down in quantity and value. The by-products of lead-zinc mining—antimony, bismuth, cadmium, indium, and tin—were down an aggregate three-quarters of a million dollars.

The value of industrial minerals was up due to increase in production and, to a greater extent, the value of asbestos, which exceeded $18 million. Although the output of sulphur was down, the total value increased substantially. This was the result of revaluing the Cominco sulphur output, which is a by-product in the form of sulphuric acid. The nominal value assigned to this sulphur equivalent was raised to be in line with world prices. The sulphur recovered at the gas plant at Taylor was valued at the average price received.

Structural materials showed little change. The value of cement production was up about 6 per cent, and that of sand and gravel was down by a like amount. A new 2-million-barrels-per-year kiln was installed in the plant of Lafarge Cement of North America Ltd. Other commodities showed no significant change.

Fuels as a whole showed a 22.6-per-cent increase in value. Coal production was up 6.8 per cent, and this increase coupled with a rise in the price put the value up 13.7 per cent. Crude oil was up 18 per cent in quantity and 24 per cent in value, while natural gas delivered to pipe-lines for distribution increased 24 per cent in quantity and 25 per cent in value.

The price for gold was 5 cents per ounce higher than in 1966. The price for silver rose to more than $2 late in 1967 and averaged an unprecedented $1.67. The average price for lead was down a little more than 1 cent, and that of zinc was down three-quarters of a cent. The price for copper dropped to 50 cents per pound from its all-time high in 1966.

The Trail custom smelter treated 13,650 tons of British Columbia crude ore, 6,403 tons of lead concentrates, and 5,562 tons of zinc concentrates, in addition to the product of its own mines and various out-of-Province sources. American smelters received the remainder of the lead concentrates and most of the zinc concentrates, as well as 11,667 tons of copper concentrates. To Japanese smelters

went 96 per cent of the production of copper concentrates, all the iron concentrates, all the nickel-copper concentrates, and a small percentage of the zinc concentrates. In summary, concentrates representing 7.4 per cent of the total value of 1967 metal production were treated at United States smelters and concentrates representing 47.5 per cent of the total were treated in Japan.

DESTINATION OF BRITISH COLUMBIA CONCENTRATES

Smelters	Gold-Silver	Lead	Zinc	Copper	Nickel-Copper	Iron
	Tons	Tons	Tons	Tons	Tons	Tons
Trail	1,530	135,165	159,572	.....	.....	.....
United States	.....	13,552	65,154	11,667	.....	.....
Japan	.....	.....	14,010	283,020	22,777	1,982,030

Six mines closed. The Aurum gold mine at Wells was a victim of fixed price and rising costs, after 34 years' production. Iron mines closed at Benson Lake and Kennedy Lake on Vancouver Island, as well as a copper mine on Quatsino Sound and lead-zinc mines on Toby Creek and east of Kimberley. Not all closures were due to exhaustion of reserves, but there is little likelihood of these mines reopening unless conditions change considerably.

The loss in gold production from the closing of the Aurum mine was more than made up by the output of gold as a by-product of copper-mining. Silver production was up 11.4 per cent.

Three mines came into production—the Tasu iron-copper mine of Wesfrob Mines Limited, the Alice mine of British Columbia Molybdenum Limited, and the Horn Silver mine of Utica Mines Ltd. The first two are open-pit mines with a combined capacity of 14,000 tons per day.

Copper production increased by 63.2 per cent to 172.7 million pounds, largely as the result of the first full year's operation at the Granisle and Western (Lynx) mines and of increased capacity at Bethlehem. At the end of 1967, 10 mines were producing major amounts of copper at an aggregate milling rate of more than 30,000 tons of ore per day. The Bethlehem mill achieved a capacity of 14,000 tons per day, or four times its initial capacity in 1963.

Prospects for further increases in the production of copper are bright indeed. The Granduc and Brenda mines are slated for production in 1969, and exploration is at an advanced stage on a number of properties.

Molybdenum is in better position than is indicated by the small increase in production from 1966. The Alice mine will have a full year's production in 1968, and the Brenda mine will contribute a major amount in 1969. The full effect of the increased capacity at Endako will be felt in 1968.

The production of lead and zinc was down for the third successive year, due in large part to the fact that most of the output of Cominco's Pine Point mine in the Northwest Territories has since 1965 been treated in the Trail smelter, thus effectively reducing the output of the Sullivan mine. In 1967 a considerable tonnage of high-grade ore from Pine Point was concentrated at the Kimberley plant.

The exploration for metals continued through 1967 at a high rate, the measurement of which is something of a problem. The Department has at all times endeavoured to report annually on as much current activity as possible, and this has become increasingly difficult in the last few years, with more ground to cover and without increase in staff. The Inspectors of Mines and the Mineralogical Branch geologists have found it increasingly difficult to obtain the information and have instituted a short work questionnaire that forms part of the central permanent record. At the same time a questionnaire was devised to obtain statistics on all forms of

exploration expenditures, with the aid of the Bureau of Economics and Statistics. In 1967 the Dominion Bureau of Statistics (D.B.S.) initiated a form to collect all data on expenditures in the field of exploration and development, extending from the broad field of prospecting to detailed investigation of ore zones, and including all such work in and adjacent to operating mines. The response to the D.B.S. form has been good, and it is hoped that further refinement of the form will result in better coverage. For the first time it has been possible to measure with reasonable accuracy the moneys expended by the mining industry for its own perpetuation.

Ten staff geologists of the Mineralogical Branch did geological field work ranging from property examinations to an areal mapping project in the Unuk River region. Results of part of this work is to be found in the Lode Metals section of this Report, and the remainder will appear in the bulletin series.

The Geological Survey of Canada reported 28 projects involving field work in British Columbia. These ranged from geological mapping at 4 miles to 1 inch and 1 mile to 1 inch to palæontological and mineralogical studies. Some of this work extended into Alberta.

Airborne magnetometer surveying under a cost-sharing arrangement with the Geological Survey of Canada was continued in the north-central plateau region. Sheets at a scale of 1 mile to 1 inch are issued about one year after flying is completed. Compilations on a 4-miles-to-1-inch scale are available for some earlier work. Following release of maps, the basic data are filed with the Geological Survey in Ottawa.

EXPLORATION AND DEVELOPMENT EXPENDITURES, 1967

	Physical Work	Land Costs	Head Office, Administration, Etc.
Exploration—prospecting and undeclared mines—			
293 companies	$22,861,000	$1,098,000	$4,067,000
Exploration—on or near declared mines—			
Two development companies	$139,000		
Fourteen operating companies	2,724,000		
	$2,863,000	5,000	227,000
Development—on declared or operating mines—			
Three development companies	$20,791,000		
Twenty operating companies	6,052,000		
	$26,843,000	29,000	2,201,000
Totals	$52,567,000	$1,132,000	$6,495,000

Grand total, $60,194,000.

The foregoing table represents minimum figures. The total shown for head office, overhead, and administration is certainly low because only those companies which performed physical work made returns. Land costs, such as leases, purchases, etc., are also certainly low. Exploration devoted to finding and investigating new ore zones is close to being correct, as there are relatively few omissions of major undertakings. Exploration and development expenditures related to declared or operating mines are the most accurate. The definition of exploration and development by operating companies may vary, but, as a rule, work on a declared or recognized orebody is " development " and work performed in search of or to prove up new ore is " exploration."

About one-half the total expenditure on exploration work was made under contract and of that on development work a little more than half. This refers to all physical and technical work, including diamond drilling, stripping, tunnelling, and

geological, geochemical, geophysical, and other surveys. The expenditure on work done by contractors amounted to some $11 million for exploration and some $15 million for development. The contractors' work force was approximately equal to the companies' work force. At the middle of the summer season the total combined work force approximated 3,000 men.

Employment figures in exploration and development are none too certain because of the short summer season, but the Department has record of 6,000 man-months worked by contractors' employees and a like figure for company employees in the conduct of general exploration for new ore deposits. The figure for company employment is somewhat at variance with that in Table 10, which shows the total as reported in the D.B.S. forms.

Over-all expenditures in the metal-mining industry in 1967 were as follows:—

Mining and quarrying operations—	
Salaries and wages	$94,523,495
Compensation, silicosis, unemployment	3,486,232
Fuel and electricity	13,590,759
Process supplies	34,368,856
Capital expenditures	33,800,000
Repairs	12,412,172
Exploration and development	60,194,000
Total	$252,375,514

This compilation is not directly comparable with the total given in the 1966 Review because expenditures of capital and repairs and of exploration and development are on a somewhat different basis.

The total gross dividends reported amounted to $48,145,202 from companies other than those producing or processing petroleum or natural gas. This figure compares with $42,385,263 for 1966. Dividend tables are no longer carried in the statistical section, and the 1965 Report is the last to list them in detail. Some history is thus lost sight of, but because of much diversification of industry the sources of profits and hence of dividends are not always clear. Dividends in the petroleum industry would be particularly difficult to assign to British Columbia operations within the scope of this Report.

In 1967 crude oil became the second most valuable product of the mineral industry, being surpassed only by copper. The production of oil and natural gas has expanded at a relatively steady rate for some years, as have prices. Fewer wells were completed than in 1966, but the fact of deeper drilling was shown by the fact that total footage remained almost unchanged at more than 1 million feet.

Drilling began on the continental shelf. The Sedco 135-F semi-submersible drilling-vessel abandoned two holes west of Vancouver Island and was drilling a third at the end of 1967.

Exploration activity increased as seismograph studies were extended into the Province from the important petroleum pools recently discovered in the Rainbow area of northwestern Alberta.

The gas-gathering system was extended to the Yoyo, Kotcho, and Sierra fields, where there are large reserves.

The major development in the marketing of petroleum products was the completion of an oil refinery at Prince George, the seventh in the Province. A total of about 103,300 barrels per day was delivered to the several refineries at the end of 1967, about half of which was produced in British Columbia.

The net cash expenditures for the petroleum industry follow:—

Exploration, including land acquisition and drilling	$57,095,000
Development drilling	13,584,000
Capital expenditures	11,177,000
Operations of natural-gas plants	18,575,000
Operations of wells	8,684,000
General (excluding income tax)	12,699,000
Total	$121,814,000

Direct revenue to the Government from the entire mineral industry is listed below:—

Free miners' certificates, recording fees, lease rentals, assessment payments, etc.	$1,117,354
Royalties on iron concentrates	138,172
Payments on industrial minerals and structural materials	207,754
Ten-per-cent mineral tax (received during 1967)	2,367,986
Coal licences	23,518
Petroleum and natural-gas rentals, fees, etc.	10,356,731
Sale of Crown reserves	14,297,816
Royalties on oil, gas, and processed products	9,607,437
Miscellaneous	17,917
Total	$38,134,685

Statistics

The statistics of the mineral industry are collected and compiled and tabulated for this Report by the Bureau of Economics and Statistics, Department of Industrial Development, Trade, and Commerce, Victoria.

CO-OPERATION WITH DOMINION BUREAU OF STATISTICS

In the interests of uniformity and to avoid duplication of effort, beginning with the statistics for 1925, the Dominion Bureau of Statistics and the various Provincial departments have co-operated in the collection and processing of mineral statistics.

Producers of metals, industrial minerals, structural materials, coal, and petroleum and natural gas are requested to submit returns in duplicate on forms prepared for use by the Province and by the Dominion Bureau of Statistics.

So far as possible both organizations follow the same practice in processing the data. The final compilation by the Dominion Bureau is usually published considerably later than the Report of the Minister of Mines and Petroleum Resources for British Columbia. Differences between the figures published by the two organizations arise mainly from the facts that the Dominion Bureau bases its quantities of metals on returns made by smelter operators, whereas the British Columbia mining statistician uses the returns covering shipments from individual mines in the same period; the Dominion Bureau uses average prices for metals considered applicable to the total Canadian production, whereas the British Columbia mining statistician uses prices considered applicable to British Columbia production.

Peat, included under the classification of fuel by the Dominion Bureau, is not regarded as mineral or fuel, and accordingly is not included in the British Columbia statistics of mineral production.

METHOD OF COMPUTING PRODUCTION

The tabulated statistics are arranged so as to facilitate comparison of the production records for the various mining divisions, and from year to year. From time to time, revisions have been made to figures in earlier reports as additional data became available or errors came to light.

Data are obtained from the certified returns made by producers of metals, industrial minerals and structural materials, and coal, and are augmented by data obtained from customs smelters. For placer gold, returns from operators are augmented by data obtained from the Royal Canadian Mint, from Gold Commissioners, and other sources. For petroleum, natural gas, and liquid by-products, production figures supplied by the Petroleum and Natural Gas Branch of the Department of Mines and Petroleum Resources are compiled from the monthly disposition reports and the Crown royalty statement filed with the Department by the producers.

Values are in Canadian funds. Weights are avoirdupois pounds and short tons (2,000 lb.), and troy ounces. Barrels are 35 imperial gallons.

METALS

Gross and Net Content

The gross contents for any metal are the sum of its total assay content in ore, concentrates, or bullion shipped to the smelter or refinery. The net contents are the gross contents less smelter and refinery losses.

In past years there have been different methods used in calculating net contents, particularly in the case of one metal contained in the concentrate of another. The present method was established in 1963 and is outlined in the following table. For example, the net content of silver in copper concentrates is 98 per cent of the gross content, of cadmium in zinc concentrates is 70 per cent of the gross content, etc.

	Lead Concentrates	Zinc Concentrates	Copper Concentrates	Copper-Nickel Concentrates	Copper Matte
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
Silver	98	98	98	----	98
Copper	Less 26 lb./ton	----	Less 10 lb./ton	85	Less 10 lb./ton
Lead	98	50	50	----	50
Zinc	50	90	----	----	----
Cadmium	----	70	70	----	----
Nickel	----	----	----	88	----

Calculated Value

Prior to 1925 the value of metals produced was calculated by using the true average prices for gold and copper, and the smelter loss of copper was taken into account. The value of other metals was calculated from the gross metal content of ores or concentrates by using a metal price which was an arbitrary percentage of the average price, as follows: Silver, 95 per cent; lead, 90 per cent; and zinc, 85 per cent. These percentages of the average price are listed in the table on page A 24.

For 1925 and subsequent years the value has been calculated by using the true average price (*see* p. A 24) and the net metal contents, in accordance with the procedures adopted by the Dominion Bureau of Statistics and the Department of Mines and Petroleum Resources.

In the statistical tables, for gold the values are calculated by multiplying the gross contents of gold by the average price for the year; for the other principal metals, by multiplying the net contents of metals as determined by means of the above table by the average price for the year.

Iron concentrate exported to Japan is valued at the price received by the shippers. The value of the iron ore used in making pig iron at Kimberley is an arbitrary figure, being the average value per ton of ore of comparable grade at its point of export from British Columbia.

The value of molybdenum is the amount received by the shippers.

The by-product metals, bismuth, tin, and indium, are valued on the basis of the price received by the shippers, and the value of antimony is the net content multiplied by the average price for the year.

Average Prices

The prices used in valuation of metal production are shown in the table on page A 24.

In 1967 the price of gold, $37.76, is the average Canadian Mint buying price.

Originally when fine gold was $20.67 per ounce the price used for valuing placer gold was established arbitrarily at $17 per ounce; between 1931 and 1962 the price was proportionately increased with the continuously changing price of fine gold. Since 1962 Canadian Mint reports giving the fine-gold content have been available for all but a very small part of the placer gold produced, and the average price listed is derived by dividing ounces of placer gold into total amount received.

Prices of the other principal metals are the average United States prices converted into Canadian funds. Average monthly prices are supplied by the Dominion Bureau of Statistics from figures published in the Metal Markets section of the Engineering and Mining Journal. Specifically, for silver it is the New York price; for lead it is the New York price; for zinc it is the price at East St. Louis of Prime Western; for copper it is the United States export refinery price; and for cadmium the New York producer's price to consumer.

For nickel the price used is the Canadian price as set by the International Nickel Company of Canada Ltd.

Industrial Minerals and Structural Materials

The prices for industrial minerals and structural materials approximate the prices received at the point of origin.

Fuel

The price per ton used in valuing coal (*see* p. A 24) is the weighted average of the f.o.b. prices for the coal sold.

The values for natural gas, natural-gas liquid by-products, and for petroleum including condensate/pentanes plus are the aggregates of amounts received for the products at the well-head.

NOTES ON PRODUCTS LISTED IN THE TABLES

Antimony.—Antimony was produced as early as 1907 from Slocan ore exported to foreign smelters, and since 1939 it has been produced as a by-product at the Trail smelter. Currently Trail is the only source of the metal. In Table 7c the antimony assigned to individual mining divisions is the reported content of concentrates exported to foreign smelters; the antimony " not assigned " is the antimony recovered at the Trail smelter from the various ores received there. *See* Tables 1, 3, and 7c.

Arsenious Oxide.—Arsenious oxide was recovered at foreign smelters from arsenical gold ores, chiefly from Hedley between 1917 and 1931, again in 1942, and from the Victoria property on Rocher Déboulé Mountain in 1928. There has been no production since 1942. *See* Tables 1 and 7d.

Asbestos.—Production of asbestos began in 1952 with the opening of the Cassiar mine, from which all Provincial production continues to be derived. From 1953 to 1961 asbestos was valued at the shipping point in North Vancouver, but beginning in 1962 it has been valued at the mine, and the values for the preceding years have been recalculated on that basis. *See* Tables 1, 3, and 7d.

Barite.—Production of barite began in 1940, and since then it has been produced continuously at several operations in the valley of the upper Columbia River, where it is mined from veins and recovered from an old lead-zinc mill tailings pond. *See* Tables 1, 3, and 7d.

Bentonite.—Small amounts of bentonite were produced between 1926 and 1944 from deposits in the coal measures near Princeton. There has been no production since 1944. *See* Tables 1 and 7d.

Bismuth.—Production of bismuth began in 1929 at the Trail smelter. It is a by-product of refining lead, and consequently it cannot be assigned to any specific property or mining division. *See* Tables 1, 3, and 7c.

Butane.—Butane is recovered as a by-product at the gas-processing plant at Taylor and at oil refineries. *See* Tables 1, 3, and 7a.

Cadmium.—Cadmium is recovered as a by-product at zinc refineries. It was first produced at the Trail zinc refinery in 1928. Cadmium occurs in variable amounts in sphalerite and is recovered from most British Columbia silver-lead-zinc ores. Cadmium assigned to individual mining divisions is the reported content of custom shipments to the Trail smelter and to foreign smelters. The "not assigned" cadmium in Table 7C is the remainder of the reported estimated recovery at the Trail smelter from British Columbia concentrates. *See* Tables 1, 3, and 7C.

Cement.—Cement is manufactured from a controlled mixture of limestone, rock, and gypsum. It has been produced in British Columbia since 1905. The total production each year fluctuates to meet current building demands. *See* Tables 1, 3, and 7E.

Clay and Shale Products.—Include brick, tile, sewer pipe, pottery, light-weight aggregate, and pozzolan. Local surface clays or shale and fireclay are used. Common clays and shales are abundant in the Province, but fireclay and other high-grade clays are scarce. *See* Tables 1, 3, and 7E.

Chromite.—Only two shipments of chromite are recorded, one of 670 tons from Cascade in 1918 and one of 126 tons from Scottie Creek in 1929. *See* Tables 1 and 7C.

Coal.—Coal was discovered at Suquash on Vancouver Island in 1835 and at Nanaimo in 1850. First production: Cariboo Mining Division, 1942; Fort Steele Mining Division, 1898; Kamloops Mining Division, 1893; Liard Mining Division, 1923; Nanaimo Mining Division, 1836; Nicola Mining Division, 1907; Omineca Mining Division, 1918; Osoyoos Mining Division, 1926; Similkameen Mining Division, 1909; and Skeena Mining Division, 1912. The Nanaimo and Comox fields produced virtually all the coal until production started from the Crowsnest area in 1898. The Nanaimo field was exhausted in 1953, when the large mines closed.

All the coal produced, including that used in making coke, is shown as primary mine production. Quantity from 1836 to 1909 is gross mine output and includes material lost in picking and washing. From 1910 the quantity is the amount sold and used, which includes sales to retail and wholesale dealers, industrial users, and company employees; coal used under company boilers, including steam locomotives; and coal used in making coke. *See* Tables 1, 3, 7A, 8A, and 8B.

Cobalt.—Cobalt was recovered in 1928 from a 22-ton shipment of arsenical gold ore made in 1926 from the Victoria property on Rocher Déboulé Mountain. *See* Tables 1 and 7C.

Coke.—Coke is manufactured from certain special types of coal and has been produced since 1895. Being a manufactured product, its value does not contribute to the total mineral production as shown in Table 1. Up to 1966, coke statistics have been included in the Annual Report as Table 9, but this table is being discontinued. The coal used in making coke is still recorded in Table 8B. Coke statistics may be obtained on request to the Bureau of Economics and Statistics, Department of Industrial Development, Trade, and Commerce, Victoria.

Copper.—Most of the copper production has come from the southern part of the Province, from Britannia, Copper Mountain, Greenwood, Highland Valley, Merritt, Nelson, Rossland, Texada Island, and Vancouver Island. Some came from Anyox and a lesser amount from Tulsequah. Production in 1966 from Granisle in the central interior is the first from an important new region. Copper production started in 1894. Ore was smelted in British Columbia first at Nelson (from the Silver King mine) and at Trail (from the Rossland mines) in 1896, and four and five years later at Grand Forks (from the Phoenix mine) and Greenwood (from the Motherlode mine). Other smaller smelters were built in the Boundary district and on Vancouver Island. In 1914 the Anyox smelter was blown in.

Copper-smelting ceased in the Boundary district in 1919, at Trail in 1929, and at Anyox in 1935. British Columbia copper ore was then smelted mainly at Tacoma, and since 1961 mainly in Japan. *See* Tables 1, 3, 6, and 7B.

Crude Oil.—Production of crude oil in British Columbia began in 1955 from the Fort St. John field but was not significant until late in 1961 (*see* Fig. 38), when the 12-inch oil pipe-line was built to connect the old-gathering terminal at Taylor to the Trans Mountain Oil Pipe Line Company pipe-line near Kamloops. Oil is now being produced from 19 separate fields, of which the Boundary Lake, Peejay, and Milligan Creek fields are currently the most productive, accounting for 78.5 per cent of the annual total.

In Tables 1, 3, and 7A, quantities given prior to 1962 under "petroleum, crude" are total sales, and from 1962 to 1965 include field and plant condensates. Beginning in 1966, total production of crude oil is given and field and plant condensates are listed separately. Full details are given in tables in the Petroleum and Natural Gas section of this report.

Diatomite.—Small amounts of diatomite have been quarried near Quesnel periodically since 1928. *See* Tables 1, 3, and 7D.

Field Condensate.—Field condensate is the liquid produced in the field from gas wells. It is listed as condensate/pentanes plus in the Petroleum and Natural Gas section of this Report. *See* Tables 1, 3, and 7A.

Fluorite (Fluorspar).—Between 1918 and 1929, fluorite was mined at the Rock Candy mine north of Grand Forks for use in the Trail lead refinery. In the last several years it has been produced as a by-product of the silica quarry at Oliver. *See* Tables 1, 3, and 7D.

Flux.—Silica and limestone are added to smelter furnaces as flux to combine with impurities in the ore and form a slag which separates from the valuable metal. The quantities of flux have been continuously recorded since 1911. *See* Tables 1, 3, and 7D.

Gold, Lode.—Gold has played an important part in mining in the Province. The first discovery of lode gold was made on Moresby Island in 1852, and the first stamp mill, to treat gold-bearing quartz, was built in the Cariboo in 1876.

The principal gold camps have been Bridge River, Hedley, Portland Canal, Rossland, Sheep Creek, and Wells. At the present time the only major producing gold mine is the Bralorne mine in the Bridge River area. Currently more than half the gold is produced as a by-product from copper, copper-zinc-silver, and other base-metal mining. *See* Tables 1, 3, 6, and 7B.

Gold, Placer.—The early explorations and settlement of the Province followed rapidly on the discovery of gold-bearing placer creeks throughout the country. The first placer miners came in 1858 to mine the lower Fraser River bars upstream from Yale.

Important placers were found in the Cariboo, Cassiar, Omineca, and Princeton areas, and at Atlin, Cedar Creek, Fort Steele, Goldstream, Rock Creek, Squaw Creek, and many other places.

Since World War II, placer-mining has been declining steadily.

A substantial part of the production, including much of the gold recovered from the Fraser River upstream from Yale (in the present New Westminster, Kamloops, and Lillooet Mining Divisions) and much of the early Cariboo production, was mined before the original organization of the Department of Mines in 1874. Consequently the amounts recorded are based on early estimates and cannot be accurately assigned to individual mining divisions.

The first year of production for major placer-producing divisions was: Atlin, 1898; Cariboo, 1858; Liard, 1873; Lillooet, 1874; Omineca, 1869.

In 1965, changes were made in the allocation of placer gold to the New Westminster and Similkameen Mining Divisions and "not assigned," to reconcile those figures with data incorporated in Bulletin No. 28, "Placer Gold Production of British Columbia." *See* Tables 1, 3, 6, and 7A.

Granules.—Rock chips used for exposed aggregate, roofing, stucco dash, terrazzo, etc., have been produced in constantly increasing amounts since 1930. *See* Tables 1, 3, and 7D.

Gypsum and Gypsite.—Gypsum and gypsite have been produced since 1911. Between 1925 and 1956 more than 1,000,000 tons was produced from quarries at Falkland; latterly production has come from large deposits near Windermere. *See* Tables 1, 3, and 7D.

Hydromagnesite.—Hydromagnesite has been produced from deposits at Atlin and Clinton, but no production has been recorded since 1921. *See* Tables 1 and 7D.

Indium.—Production of indium as a by-product of zinc-refining at the Trail smelter began in 1942. Production figures have not been disclosed since 1958.

Iron Concentrates.—Iron ore was produced in small quantities as early as 1885. Sustained production began in 1951 with shipments of concentrated magnetite ore to Japan. The ore has been mined mainly from magnetite and copper-bearing magnetite deposits on Vancouver Island, Texada Island, and Moresby Island.

Since 1961, calcined iron sulphide from the tailings of the Sullivan mine has been used for making pig iron at Kimberley. The entire production, credited to the Fort Steele Mining Division in Table 7C, is of calcine. *See* Tables 1, 3, 6, and 7C.

Iron Oxide.—Iron oxide, ochre, and bog iron were mined as early as 1918 from several occurrences, but mainly from limonite deposits north of Squamish. None has been produced since 1950. *See* Tables 1 and 7D.

Jade (Nephrite).—Production of jade (nephrite) has been recorded only since 1959 despite there being several years of significant production prior to that date. The jade is recovered as alluvial boulders from the Fraser River, the Bridge River and its tributaries Marshall and Cadwallader Creeks, Kwanika and Wheaton Creeks, and Dease Lake. *See* Tables 1, 3, and 7D.

Lead.—Lead was first produced in British Columbia in 1887. Almost all has come from the southeastern part of the Province, where the Sullivan mine has produced 83 per cent of the Provincial total. Other important mines are at Salmo, Pend d'Oreille River, and North Kootenay Lake.

In 1958, revisions were made in some yearly totals for lead to adjust them for recovery of lead from slag treated at the Trail smelter. *See* Tables 1, 3, 6, and 7B.

Limestone.—Limestone, besides being used for flux and granules (where it is recorded separately), is used in cement manufacture, in the pulp and paper industry, in agriculture, and in making builders' lime. It has been produced since 1886, and currently most production is from quarries on northern Texada Island. *See* Tables 1, 3, and 7E.

Magnesium.—Magnesium was produced in 1941 and 1942 by Cominco Ltd. from a large deposit of magnesite at Marysville. *See* Tables 1 and 7C.

Magnesium Sulphate. — Magnesium sulphate has been recovered in small amounts at various times since 1915 from alkali lakes near Clinton, Basque, and Osoyoos. There has been no production since 1942.

Principal productive periods: Clinton, 1918–20, 1,923 tons, $39,085; Kamloops, 1918–42, 8,742 tons, $193,967; Osoyoos, 1915–19, 3,229 tons, $21,300. *See* Tables 1 and 7D.

Manganese.—The only manganese ore produced was shipped in 1918–20 from a bog deposit near Kaslo and from Hill 60 near Cowichan Lake, and in 1956 a test shipment was made by Olalla Mines Ltd. *See* Tables 1 and 7C.

Mercury.—Mercury was first produced near Savona in 1895, and since then small amounts have been recovered from the same source and from the Bridge River area. The main production was in 1940–44 from the Pinchi Lake mine and Takla mercury mine near Fort St. James. *See* Tables 1 and 7C.

Mica.—Sheet mica has not been produced commercially in British Columbia, but since 1932 small amounts of mica for grinding has been produced from deposits at Albreda, Armstrong, and Oliver. *See* Tables 1, 3, and 7D.

Molybdenum.—Molybdenum ore in small amounts was produced from high-grade deposits between 1914 and 1918. Beginning in 1964, first as a by-product of the Bethlehem copper mine, the production of molybdenum ore has increased tremendously from several low-grade mines. Now it is the fourth most valuable metal product of the Province, and a molybdenum mine (Endako) is currently the largest open-pit mine in the Province. *See* Tables 1, 3, 6, and 7C.

Natro-alunite.—In 1912 and 1913, 400 tons of natro-alunite was mined from a small low-grade deposit at Kyuquot Sound. There has been no subsequent production. *See* Tables 1 and 7D.

Natural Gas.—Commercial production of natural gas began in 1954 to supply the community of Fort St. John. Since the completion in 1957 of the gas plant at Taylor and the 30-inch pipe-line to serve British Columbia and the northwestern United States, the daily average volume of production has increased to more than 500,000,000 cubic feet per day (*see* Fig. 39). In 1967 there were 29 separately producing gasfields.

The production shown in Tables 1, 3, and 7A is the total amount sold of residual gas from processing plants plus dry and associated gas from the gas-gathering system; that is, the quantity delivered to the main transmission-line. The quantity is net after deducting gas used on leases, metering difference, and gas used or lost in the cleaning plant. The quantity is reported as thousands of cubic feet at standard conditions (14.4 pounds per square inch pressure, 60° F. temperature, up to and including the year 1960, and thereafter 14.65 pounds per square inch pressure, 60° F. temperature).

Gross well output, other production, delivery, and sales data are tabulated in the Petroleum and Natural Gas section of this report.

Nickel.—Nickel was produced in 1936 and 1937 and continuously since 1958, all being derived from one mine, the Pride of Emory near Hope. Since 1960, bulk nickel-copper concentrates have been shipped to Japan for smelting. *See* Tables 1, 3, and 7C.

Palladium.—Palladium was recovered in 1928, 1929, and 1930 as a by-product of the Trail refinery and is presumed to have originated in copper concentrates shipped to the smelter from the Copper Mountain mine. *See* Tables 1 and 7C.

Perlite.—In 1953 a test shipment of 1,112 tons was made from a quarry on Francois Lake. There has been no further production. *See* Tables 1 and 7D.

Petroleum, Crude.—*See* Crude Oil.

Phosphate Rock.—Between 1927 and 1933 Cominco produced 3,842 tons of phosphate rock for test purposes, but the grade proved to be too low for commercial use. There has been no further production. *See* Tables 1 and 7D.

Plant Condensate.—Plant condensate is liquid produced from natural gas at field plants or at the Taylor gas-processing plant. *See* Tables 1, 3, and 7A.

It is listed as condensate/pentanes plus in the Petroleum and Natural Gas section of this report.

Platinum.—Platinum has been produced intermittently from placer streams in small amounts since 1887, mostly from the Tulameen and Similkameen Rivers. Some platinum recovered between 1928 and 1930 as a by-product of the Trail refinery is presumed to have originated in copper concentrates shipped to the smelter from the Copper Mountain mine. *See* Tables 1, 3, and 7C.

Propane.—Propane is recovered from gas-processing plants at Taylor and Boundary Lake, and at oil refineries. *See* Tables 1, 3, and 7A.

Rock.—Production of rubble, riprap, and crushed rock has been recorded since 1909. *See* Tables 1, 3, and 7E.

Sand and Gravel.—Sand and gravel are used as aggregate in concrete work of all kinds. The output varies from year to year according to the state of activity of the construction industry. *See* Tables 1, 3, and 7E.

Selenium.—The only recorded production of selenium, 731 pounds, was in 1931 from the refining of blister copper from the Anyox smelter. *See* Tables 1 and 7C.

Silver.—Production of silver began in British Columbia in 1887. Silver is produced from silver ores and is recovered as a by-product of silver-lead-zinc, copper-zinc, or gold ores. Most of it is refined at Trail, but some is exported with concentrates to American or Japanese smelters or may go to the Mint in gold bullion. At present the largest single source of silver is the Sullivan mine. *See* Tables 1, 3, 6, and 7B.

Sodium Carbonate.—Sodium carbonate was recovered between 1921 and 1949 from alkali lakes in the dry belt. About 93 per cent was produced from the Clinton area and the balance from around Kamloops. There has been no further production. *See* Tables 1 and 7D.

Stone.—Dimensional stone for building purposes is quarried when required from a granite deposit on Nelson Island and an andesite deposit on Haddington Island. Other stone close to local markets is quarried periodically or as needed for special building projects. *See* Tables 1, 3, and 7E.

Structural Materials.—Unclassified materials valued at $5,972,171 in Table 7E is the total for structural materials in the period 1886–1919 that cannot be allotted to particular classes of structural materials or assigned to mining divisions, and includes $726,323 shown against 1896 in Table 2 that includes unclassified structural materials in that and previous years not assignable to particular years. The figure 3,150,828 in Table 7E under " Other Clay Products " is the value in the period 1886–1910 that cannot be allotted to particular clay products or assigned to mining divisions. *See* Tables 1, 2, 3, 7A, and 7E.

Sulphur.—The production of sulphur has been recorded since 1916. From 1916 to 1927 the amounts include the sulphur content of pyrite shipped. From 1928 the amounts include the estimated sulphur content of pyrite shipped plus the sulphur contained in sulphuric acid made from waste smelter gases. The sulphur content of pyrrhotite roasted at the Kimberley fertilizer plant is included since 1953. Since 1958 elemental sulphur recovered from the Jefferson Lake Petrochemical Co. plant at Taylor has been included. *See* Tables 1, 3, and 7D.

Talc.—Between 1916 and 1936, talc was quarried at Leech River and at Anderson Lake for dusting asphalt roofing. There has been no production since 1936. *See* Tables 1, 3, and 7D.

Tin.—Tin as cassiterite is a by-product of the Sullivan mine, where it has been produced since 1941. The tin concentrate is shipped to an American smelter for treatment. *See* Tables 1, 3, and 7C.

Tungsten.—Tungsten, very largely as scheelite concentrates, was produced from 1937 to 1958, first from the Cariboo in 1937 and during World War II from

the Red Rose mine near Hazelton and the Emerald mine near Salmo. The Red Rose closed in 1954 and the Emerald in 1958.

A very small amount of wolframite came from Surprise Creek near Atlin. *See* Tables 1, 3, and 7C.

Volcanic Ash.—The only recorded production of volcanic ash is 30 tons from the Cariboo Mining Division in 1954. *See* Tables 1 and 7D.

Zinc.—Zinc was first produced in 1905. Currently the total value of all zinc production is greater than that of any of the other metals, lead being in second place.

By far the greatest amount of zinc has been mined in southeastern British Columbia, at the Sullivan mine and at mines near Ainsworth, Invermere, Moyie Lake, Riondel, Salmo, Slocan, and Spillimacheen. The greatest zinc mine is the Sullivan, which has contributed 71 per cent of the total zinc production of the Province.

Records for the period 1905 to 1908 show shipments totalling 18,845 tons of zinc ore and zinc concentrates of unstated zinc content. In 1958, revisions were made to some yearly totals for zinc to adjust them for recovery of zinc from slag treated at the Trail smelter. *See* Tables 1, 3, 6, and 7B.

PRICES USED IN VALUING PROVINCIAL PRODUCTION OF GOLD, SILVER, COPPER, LEAD, ZINC, AND COAL

Year	Gold,[1] Placer, Oz.	Gold, Fine, Oz.	Silver, Fine, Oz.	Copper, Lb.	Lead, Lb.	Zinc, Lb.	Coal, Short Ton
	$	$	Cents	Cents	Cents	Cents	$
1901	17.00	20.67	56.002 N.Y.	16.11 N.Y.	2.577 N.Y.	.....	2.679
1902	.....	.....	49.55 ,,	11.70 ,,	3.66 ,,	.....	.....
1903	.....	.....	50.78 ,,	13.24 ,,	3.81 ,,	.....	.....
1904	.....	.....	53.36 ,,	12.82 ,,	3.88 ,,	.....	.....
1905	.....	.....	51.33 ,,	15.59 ,,	4.24 ,,	.....	.....
1906	.....	.....	63.45 ,,	19.28 ,,	4.81 ,,	.....	.....
1907	.....	.....	62.06 ,,	20.00 ,,	4.80 ,,	.....	3.125
1908	.....	.....	50.22 ,,	13.20 ,,	3.78 ,,	.....	.....
1909	.....	.....	48.93 ,,	12.98 ,,	3.85 ,,	.....	.....
1910	.....	.....	50.812 ,,	12.738 ,,	4.00 ,,	4.60 E. St. L.	.....
1911	.....	.....	50.64 ,,	12.38 ,,	3.98 ,,	4.90 ,,	.....
1912	.....	.....	57.79 ,,	16.341 ,,	4.024 ,,	5.90 ,,	.....
1913	.....	.....	56.80 ,,	15.27 ,,	3.93 ,,	4.80 ,,	.....
1914	.....	.....	52.10 ,,	13.60 ,,	3.50 ,,	4.40 ,,	.....
1915	.....	.....	47.20 ,,	17.28 ,,	4.17 ,,	11.25 ,,	.....
1916	.....	.....	62.38 ,,	27.202 ,,	6.172 ,,	10.88 ,,	.....
1917	.....	.....	77.35 ,,	27.18 ,,	7.91 ,,	7.566 ,,	.....
1918	.....	.....	91.93 ,,	24.63 ,,	6.67 ,,	6.94 ,,	4.464
1919	.....	.....	105.57 ,,	18.70 ,,	5.19 ,,	6.24 ,,	.....
1920	.....	.....	95.80 ,,	17.45 ,,	7.16 ,,	6.52 ,,	.....
1921	.....	.....	59.52 ,,	12.50 ,,	4.09 ,,	3.95 ,,	.....
1922	.....	.....	64.14 ,,	13.38 ,,	5.16 ,,	4.86 ,,	.....
1923	.....	.....	61.63 ,,	14.42 ,,	6.54 ,,	5.62 ,,	.....
1924	.....	.....	63.442 ,,	13.02 ,,	7.287 ,,	5.39 ,,	.....
1925	.....	.....	69.065 ,,	14.042 ,,	7.848 Lond.	7.892 Lond.	.....
1926	.....	.....	62.107 ,,	13.795 ,,	6.751 ,,	7.409 ,,	.....
1927	.....	.....	56.370 ,,	12.920 ,,	5.256 ,,	6.194 ,,	.....
1928	.....	.....	58.176 ,,	14.570 ,,	4.575 ,,	5.493 ,,	.....
1929	.....	.....	52.993 ,,	18.107 ,,	5.050 ,,	5.385 ,,	.....
1930	.....	.....	38.154 ,,	12.982 ,,	3.927 ,,	3.599 ,,	.....
1931	.....	.....	28.700 ,,	8.116 ,,	2.710 ,,	2.554 ,,	4.018
1932	19.30	23.47	31.671 ,,	6.380 Lond.	2.113 ,,	2.405 ,,	3.795
1933	23.02	28.60	37.832 ,,	7.454 ,,	2.391 ,,	3.210 ,,	.....
1934	28.37	34.50	47.461 ,,	7.419 ,,	2.436 ,,	3.044 ,,	.....
1935	28.94	35.19	64.790 ,,	7.795 ,,	3.133 ,,	3.099 ,,	.....
1936	28.81	35.03	45.127 ,,	9.477 ,,	3.913 ,,	3.315 ,,	.....
1937	28.77	34.99	44.881 ,,	13.078 ,,	5.110 ,,	4.902 ,,	.....
1938	28.93	35.18	43.477 ,,	9.972 ,,	3.344 ,,	3.073 ,,	.....
1939	29.72	36.14	40.488 ,,	10.092 ,,	3.169 ,,	3.069 ,,	.....
1940	31.66	38.50	38.249 ,,	10.086 ,,	3.362 ,,	3.411 ,,	.....
1941	31.66	38.50	38.261 ,,	10.086 ,,	3.362 ,,	3.411 ,,	.....
1942	31.66	38.50	41.166 ,,	10.086 ,,	3.362 ,,	3.411 ,,	.....
1943	31.66	38.50	45.254 ,,	11.750 ,,	3.754 ,,	4.000 ,,	.....
1944	31.66	38.50	43.000 ,,	12.000 ,,	4.500 ,,	4.300 ,,	.....
1945	31.66	38.50	47.000 ,,	12.550 ,,	5.000 ,,	6.440 ,,	.....
1946	30.22	36.75	83.650 ,,	12.800 ,,	6.750 ,,	7.810 ,,	4.68
1947	28.78	35.00	72.000 ,,	20.390 ,,	13.670 ,,	11.230 ,,	5.12
1948	28.78	35.00	75.000 Mont.	22.350 U.S.	18.040 ,,	13.930 ,,	6.09
1949	29.60	36.00	74.250 U.S.	19.973 ,,	15.800 U.S.	13.247 U.S.	6.51
1950	31.29	38.05	80.635 ,,	23.428 ,,	14.454 ,,	15.075 ,,	6.43
1951	30.30	36.85	94.550 ,,	27.700 ,,	18.400 ,,	19.900 ,,	6.46
1952	28.18	34.27	83.157 ,,	31.079 ,,	16.121 ,,	15.874 ,,	6.94
1953	28.31	34.42	83.774 ,,	30.333 ,,	13.265 ,,	10.675 ,,	6.88
1954	27.52	34.07	82.982 ,,	29.112 ,,	13.680 ,,	10.417 ,,	7.00
1955	28.39	34.52	87.851 ,,	38.276 ,,	14.926 ,,	12.127 ,,	6.74
1956	28.32	34.44	89.373 ,,	39.787 ,,	15.756 ,,	13.278 ,,	6.59
1957	27.59	33.55	87.057 ,,	26.031 ,,	14.051 ,,	11.175 ,,	6.76
1958	27.94	33.98	86.448 ,,	23.419 ,,	11.755 ,,	10 009 ,,	7.45
1959	27.61	33.57	87.469 ,,	27.708 ,,	11.670 ,,	10.978 ,,	7.93
1960	27.92	33.95	88.633 ,,	28.985 ,,	11.589 ,,	12.557 ,,	6.64
1961	29.24	35.46	93.696 ,,	28.288 ,,	11.011 ,,	11.695 ,,	7.40
1962	29.25	37.41	116.029 ,,	30.473 ,,	10.301 ,,	12.422 ,,	7.43
1963	29.31	37.75	137.965 ,,	30.646 ,,	12.012 ,,	13.173 ,,	7.33
1964	29.96	37.75	139.458 ,,	33.412 ,,	14.662 ,,	14.633 ,,	6.94
1965	28.93	37.73	139.374 ,,	38.377 ,,	17.247 ,,	15.636 ,,	7.03
1966	29.08	37.71	139.300 ,,	53.344 ,,	16.283 ,,	15.622 ,,	7.28
1967	28.77	37.76	167.111 ,,	50.022 ,,	15.102 ,,	14.933 ,,	7.75

[1] *See* page A 16, under gold, placer.

Prices for fine gold are the Canadian Mint buying prices. Prices for other metals are those of the markets indicated, converted into Canadian funds. The abbreviations are: Mont.=Montreal; N.Y.=New York; Lond.=London; E. St. L.=East St. Louis; and U.S.=United States.

The prices for gold and copper are true average prices. Prior to 1925 the prices of other metals are the following percentages of the year's average price for the metal: Silver, 95 per cent; lead, 90 per cent; and zinc, 85 per cent. Since 1925 the prices of all metals are true average prices.

TABLE 1.—MINERAL PRODUCTION: TOTAL TO DATE, PAST YEAR, AND LATEST YEAR

Products[1]	Total Quantity to Date	Total Value to Date	Quantity, 1966	Value, 1966	Quantity, 1967	Value, 1967
Metals		$		$		$
Antimony ..... lb.	49,859,826	14,653,918	1,405,681	745,011	1,267,686	671,874
Bismuth ..... lb.	6,344,049	11,765,019	47,435	198,848	142,507	572,878
Cadmium ..... lb.	35,999,631	61,143,642	1,169,570	3,017,491	994,365	2,784,222
Chromite ..... tons	796	32,295	.....	.....	.....	.....
Cobalt ..... lb.	1,730	420	.....	.....	.....	.....
Copper ..... lb.	3,718,897,656	788,573,005	105,800,568	56,438,255	172,739,548	88,135,172
Gold—placer ..... oz.	5,233,848	96,911,921	1,535	44,632	891	25,632
„ —lode ..... oz.	16,684,295	491,030,265	119,508	4,506,646	126,157	4,763,688
Iron concentrates ..... tons	20,257,256	180,150,667	2,151,804	20,778,934	2,154,443	20,820,765
Lead ..... lb.	15,171,777,138	1,246,368,659	211,490,107	34,436,934	208,131,894	31,432,079
Magnesium ..... lb.	204,632	88,184	.....	.....	.....	.....
Manganese ..... tons	1,724	32,668	.....	.....	.....	.....
Mercury ..... lb.	4,171,110	10,447,358	.....	.....	380	2,600
Molybdenum ..... lb.	41,960,948	71,354,438	17,094,927	27,606,061	17,517,348	31,249,772
Nickel ..... lb.	32,411,701	26,373,985	3,622,400	3,104,397	4,180,842	3,946,715
Palladium ..... oz.	749	30,462	.....	.....	.....	.....
Platinum ..... oz.	1,407	135,008	.....	.....	.....	.....
Selenium ..... lb.	731	1,389	.....	.....	.....	.....
Silver ..... oz.	465,859,503	313,557,280	5,549,131	7,729,939	6,180,739	10,328,695
Tin ..... lb.	17,274,649	14,809,273	710,752	1,130,096	437,804	621,682
Tungsten (WO_3) ..... lb.	16,019,324	38,663,751	.....	.....	.....	.....
Zinc ..... lb.	13,549,404,824	1,255,584,491	305,124,440	47,666,540	262,830,908	39,248,539
Others	.....	9,944,214	.....	1,632,747	.....	1,327,713
Totals	.....	4,631,652,312	.....	209,036,531	.....	235,932,026
Industrial Minerals						
Arsenious oxide ..... lb.	22,019,420	273,201	.....	.....	.....	.....
Asbestos ..... tons	683,422	133,692,993	88,771	15,718,741	92,192	18,273,220
Barite ..... tons	275,742	3,119,031	21,888	176,240	23,466	176,882
Bentonite ..... tons	791	16,858	.....	.....	.....	.....
Diatomite ..... tons	6,616	158,166	70	3,755	2,819	14,096
Fluorspar ..... tons	35,643	794,833	152	4,986	80	2,464
Fluxes ..... tons	3,988,104	7,229,775	23,913	112,314	48,052	221,212
Granules ..... tons	302,286	4,391,005	23,956	424,667	31,283	305,655
Gypsum and gypsite ..... tons	3,287,757	12,235,390	206,026	576,873	230,044	691,592
Hydromagnesite ..... tons	2,253	27,536	.....	.....	.....	.....
Iron oxide and ochre ..... tons	18,108	155,050	.....	.....	.....	.....
Jade ..... lb.	258,445	133,109	11,633	13,225	20,160	24,341
Magnesium sulphate ..... tons	13,894	254,352	.....	.....	.....	.....
Mica ..... lb.	12,822,050	185,818	.....	.....	.....	.....
Natro-alunite ..... tons	522	9,398	.....	.....	.....	.....
Perlite ..... tons	1,112	11,120	.....	.....	.....	.....
Phosphate rock ..... tons	3,842	16,894	.....	.....	.....	.....
Sodium carbonate ..... tons	10,492	118,983	.....	.....	.....	.....
Sulphur ..... tons	6,289,397	78,100,899	342,478	5,834,523	314,490	9,654,603
Talc ..... tons	1,805	34,871	.....	.....	.....	.....
Volcanic ash ..... tons	30	300	.....	.....	.....	.....
Totals	.....	240,959,582	.....	22,865,324	.....	29,364,065
Structural Materials						
Cement ..... tons	10,899,078	176,472,503	707,506	15,959,293	708,855	16,929,451
Clay products	.....	64,038,164	.....	4,100,192	.....	3,945,207
Lime and limestone ..... tons	.....	43,927,925	1,483,949	2,696,011	1,645,253	2,822,138
Rock ..... tons	.....	38,912,410	1,590,189	1,890,992	2,287,407	2,967,195
Sand and gravel ..... tons	.....	184,910,797	24,320,013	21,959,733	23,210,746	20,643,673
Stone ..... tons	1,158,048	9,131,636	76,720	215,043	3,577	51,425
Not assigned	.....	5,972,171	.....	.....	.....	.....
Totals	.....	523,365,606	.....	46,821,264	.....	47,359,089
Fuels						
Coal ..... tons	140,633,492	602,317,732	850,821	6,196,219	908,790	7,045,341
Crude oil ..... bbl.	86,467,553	181,915,757	16,638,181	36,268,683	19,656,799	44,748,477
Field condensate ..... bbl.	161,741	355,440	39,571	86,265	40,570	92,357
Plant condensate ..... bbl.	8,618,053	4,900,300	974,564	312,360	1,016,045	267,941
Nat'l gas to pipe-line....M s.c.f.	1,139,229,860	110,335,069	161,264,334	17,339,587	198,626,177	21,667,136
Butane ..... bbl.	3,729,197	1,193,343	500,973	160,312	588,118	188,197
Propane ..... bbl.	2,227,300	712,733	334,315	106,980	413,058	132,178
Totals	.....	901,730,374	.....	60,470,406	.....	74,141,627
Grant totals	.....	6,297,707,874	.....	339,193,525	.....	386,796,807

[1] *See* notes on individual products listed alphabetically on pages A 17 to A 23.

TABLE 2.—TOTAL VALUE OF PRODUCTION, 1836–1967

Year	Metals	Industrial Minerals	Structural Materials	Fuels	Total
	$	$	$	$	$
1836–86	52,808,750	----------	43,650	10,758,565	63,610,965
1887	729,381	----------	22,168	1,240,080	1,991,629
1888	745,794	----------	46,432	1,467,903	2,260,129
1889	685,512	----------	77,517	1,739,490	2,502,519
1890	572,884	----------	75,201	2,034,420	2,682,505
1891	447,136	----------	79,475	3,087,291	3,613,902
1892	511,075	----------	129,234	2,479,005	3,119,314
1893	659,969	----------	----------	2,934,882	3,594,851
1894	1,191,728	----------	----------	3,038,859	4,230,587
1895	2,834,629	----------	----------	2,824,687	5,659,316
1896	4,973,769	----------	726,323	2,693,961	8,394,053
1897	7,575,262	----------	150,000	2,734,522	10,459,784
1898	7,176,870	----------	150,000	3,582,595	10,909,465
1899	8,107,509	----------	200,000	4,126,803	12,434,312
1900	11,360,546	----------	250,000	4,744,530	16,355,076
1901	14,258,455	----------	400,000	5,016,398	19,674,853
1902	12,163,561	----------	450,000	4,832,257	17,445,818
1903	12,640,083	----------	525,000	4,332,297	17,497,380
1904	13,424,755	2,400	575,000	4,953,024	18,955,179
1905	16,289,165	----------	660,800	5,511,861	22,461,826
1906	18,449,602	----------	982,900	5,548,044	24,980,546
1907	17,101,305	----------	1,149,400	7,637,713	25,888,418
1908	15,227,991	----------	1,200,000	7,356,866	23,784,857
1909	14,668,141	----------	1,270,559	8,574,884	24,513,584
1910	13,768,731	----------	1,500,000	11,108,335	26,377,066
1911	11,880,062	46,345	3,500,917	8,071,747	23,499,071
1912	18,218,266	17,500	3,436,222	10,786,812	32,458,800
1913	17,701,432	46,446	3,249,605	9,197,460	30,194,943
1914	15,790,727	51,810	2,794,107	7,745,847	26,382,491
1915	20,765,212	133,114	1,509,235	7,114,178	29,521,739
1916	32,092,648	150,718	1,247,912	8,900,675	42,391,953
1917	27,299,934	174,107	1,097,900	8,484,343	37,056,284
1918	27,957,302	281,131	783,280	12,833,994	41,855,707
1919	20,058,217	289,426	980,790	11,975,671	33,304,104
1920	19,687,532	508,601	1,962,824	13,450,169	35,609,126
1921	13,160,417	330,503	1,808,392	12,836,013	28,135,325
1922	19,605,401	251,922	2,469,967	12,880,060	35,207,350
1923	25,769,215	140,409	2,742,388	12,678,548	41,330,560
1924	35,959,566	116,932	2,764,013	9,911,935	48,752,446
1925	46,480,742	101,319	2,766,838	12,168,905	61,517,804
1926	51,867,792	223,748	3,335,885	11,650,180	67,077,605
1927	45,134,289	437,729	2,879,160	12,269,135	60,720,313
1928	48,640,158	544,192	3,409,142	12,633,510	65,227,002
1929	52,805,345	807,502	3,820,732	11,256,260	68,689,839
1930	41,785,380	457,225	4,085,105	9,435,650	55,763,360
1931	23,530,469	480,319	3,538,519	7,684,155	35,233,462
1932	20,129,869	447,495	1,705,708	6,523,644	28,806,716
1933	25,777,723	460,683	1,025,586	5,375,171	32,639,163
1934	35,177,224	486,554	1,018,719	5,725,133	42,407,630
1935	42,006,618	543,583	1,238,718	5,048,864	48,837,783
1936	45,889,944	724,362	1,796,677	5,722,502	54,133,485
1937	65,224,245	976,171	2,098,339	6,139,920	74,438,675
1938	55,959,713	916,841	1,974,976	5,565,069	64,416,599
1939	56,216,049	1,381,720	1,832,464	6,280,956	65,711,189
1940	64,332,166	1,073,023	2,534,840	7,088,265	75,028,294
1941	65,807,630	1,253,561	2,845,262	7,660,000	77,566,453
1942	63,626,140	1,434,382	3,173,635	8,237,172	76,471,329
1943	55,005,394	1,378,337	3,025,255	7,742,030	67,151,016
1944	42,095,013	1,419,248	3,010,088	8,217,966	54,742,315
1945	50,673,592	1,497,720	3,401,229	6,454,360	62,026,901
1946	58,834,747	1,783,010	5,199,563	6,732,470	72,549,790
1947	95,729,867	2,275,972	5,896,803	8,680,440	112,583,082
1948	124,091,753	2,358,877	8,968,222	9,765,395	145,184,247
1949	110,219,917	2,500,799	9,955,790	10,549,924	133,226,430
1950	117,166,836	2,462,340	10,246,939	10,119,303	139,995,418

TABLE 2.—TOTAL VALUE OF PRODUCTION, 1836–1967—*Continued*

Year	Metals	Industrial Minerals	Structural Materials	Fuels	Total
	$	$	$	$	$
1951	153,598,411	2,493,840	10,606,048	10,169,617	176,867,916
1952	147,857,523	2,181,464	11,596,961	9,729,739	171,365,687
1953	126,755,705	3,002,673	13,555,038	9,528,279	152,841,695
1954	123,834,286	5,504,114	14,395,174	9,161,089	152,894,663
1955	142,609,505	6,939,490	15,299,254	9,005,111	173,853,360
1956	149,441,246	9,172,792	20,573,631	9,665,983	188,853,652
1957	125,353,920	11,474,050	25,626,939	8,537,920	170,992,829
1958	104,251,112	9,958,768	19,999,576	10,744,093	144,953,549
1959	105,076,530	12,110,286	19,025,209	11,439,192	147,651,217
1960	130,304,373	13,762,102	18,829,989	14,468,869	177,365,333
1961	128,565,774	12,948,308	19,878,921	18,414,318	179,807,321
1962	159,627,293	14,304,214	21,366,265	34,073,712	229,371,484
1963	172,852,866	16,510,898	23,882,190	42,617,633	255,863,587
1964	180,926,329	16,989,469	26,428,939	42,794,431	267,139,168
1965	177,101,733	20,409,649	32,325,714	50,815,252	280,652,348
1966	209,036,531	22,865,324	46,821,264	60,470,406	339,193,525
1967	235,932,026	29,364,065	47,359,089	74,141,627	386,796,807
Totals	4,631,652,312	240,959,582	523,365,606	901,730,374	6,297,707,874

TABLE 3.—QUANTITY AND VALUE OF MINERAL PRODUCTS FOR YEARS 1958 TO 1967

Description	1958		1959		1960		1961		1962	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Metals		$		$		$		$		$
Antimony lb.	858,633	284,208	1,657,797	540,276	1,651,786	538,482	1,331,297	469,948	1,931,397	748,223
Bismuth lb.	154,034	308,068	181,843	345,502	213,009	419,628	283,363	637,567	228,601	507,494
Cadmium lb.	1,425,108	2,166,164	1,695,821	2,170,651	1,778,866	2,525,990	907,432	1,451,891	2,086,692	3,839,513
Copper lb.	12,658,649	2,964,529	16,233,546	4,497,991	33,064,429	9,583,724	31,692,412	8,965,149	108,979,144	33,209,215
Gold—placer, crude oz.	5,650	157,871	7,570	208,973	3,847	107,418	3,416	99,884	3,315	96,697
„ —lode, fine oz.	194,354	6,604,149	173,146	5,812,511	205,580	6,979,441	159,821	5,667,253	158,850	5,942,101
Iron concentrates tons	630,271	4,193,442	849,248	6,363,848	1,160,355	10,292,847	1,335,068	12,082,540	1,793,847	18,326,911
Lead lb.	294,573,159	34,627,075	287,423,357	33,542,306	333,608,699	38,661,912	384,284,524	42,313,569	335,282,537	34,537,454
Molybdenum lb.	----------	----------	----------	----------	9,023	9,500	----------	----------	----------	----------
Nickel lb.	1,408,490	996,507	1,061,532	743,072	3,779,878	2,645,915	4,180,677	3,194,037	----------	----------
Platinum oz.	4	260	----------	----------	----------	----------	----------	----------	3.476,467	2,902,850
Silver oz.	7,041,058	6,086,854	6,198,101	5,421,417	7,446,643	6,600,183	7,373,997	6,909,140	5	375
Tin lb.	795,496	625,260	747,443	627,852	621,718	522,243	1,119,350	727,578	6,189,804	7,181,907
Tungsten (WO_3) lb.	690,976	1,884,209	----------	----------	----------	----------	----------	----------	650,941	442,640
Zinc lb.	432,002,790	43,234,839	402,342,850	44,169,198	403,399,319	50,656,726	387,951,190	45,370,891	413,430,817	51,356,376
Others	----------	117,677	----------	632,933	----------	760,364	----------	676,327	----------	535,537
Totals	----------	104,251,112	----------	105,076,530	----------	130,304,373	----------	128,565,774	----------	159,627,293
Industrial Minerals										
Asbestos tons	30,078	6,398,679	33,883	7,878,947	40,748	9,482,923	45,113	8,648,503	55,133	10,297,360
Barite tons	16,144	341,700	23,142	187,368	23,573	279,716	15,478	151,388	6,511	57,062
Diatomite tons	27	540	5	100	44	1,430	214	8,817	211	10,228
Fluorspar tons	32	1,386	----------	----------	----------	----------	----------	----------	----------	----------
Fluxes (quartz, limestone) tons	90,603	310,244	70,570	248,913	83,370	294,559	53,335	190,500	62,743	228,477
Granules (quartz, limestone, granite) tons	22,674	284,330	19,072	254,251	19,063	257,067	17,463	253,015	18,251	311,902
Gypsum and products tons	70,498	211,494	112,223	282,030	107,900	337,200	153,300	459,900	147,900	443,700
Jade lb.	----------	----------	15,000	5,000	50,300	10,325	69,751	20,876	56,935	20,760
Mica lb.	----------	----------	----------	----------	122,000	3,186	250,000	8,025	----------	----------
Sulphur tons	211,300	2,410,395	251,552	3,253,677	264,705	3,095,696	242,377	3,207,284	239,191	2,934,725
Totals	----------	9,958,768	----------	12,110,286	----------	13,762,102	----------	12,948,308	----------	14,304,214
Structural Materials										
Brick—common No.	427,550	15,125	385,810	11,954	2,262,653	187,673	244,532	14,809	1,179,165	54,849
„ —other	----------	749,618	----------	966,666	----------	766,956	----------	911,315	----------	949,889
Clays tons	4,105	12,579	6,250	17,001	8,003	22,671	7,908	28,396	8,105	30,027
Structural and drain tile	----------	762,050	----------	830,085	----------	700,700	----------	732,751	----------	935,573
Pottery and other clay products	----------	100,803	----------	127,812	----------	395,708	----------	679,193	----------	537,100
Cement tons	414,396	6,755,619	427,181	7,049,638	384,853	6,432,752	417,336	7,122,046	397,435	7,112,890
Lime and limestone tons	269,747	997,819	519,580	1,481,292	565,945	1,602,019	758,882	1,864,315	559,028	1,513,579
Rubble, riprap, crushed rock tons	1,866,950	2,098,952	1,169,854	1,128,353	1,148,305	1,075,373	1,539,640	1,016,086	1,897,272	1,284,301
Sand and gravel tons	14,173,169	8,442,676	11,349,121	7,342,698	12,355,955	7,597,278	11,424,958	7,439,710	17,757,391	8,862,767
Stone tons	2,141	64,335	13,710	69,710	4,328	48,859	5,400	70,300	8,023	85,290
Totals	----------	19,999,576	----------	19,025,209	----------	18,829,989	----------	19,878,921	----------	21,366,265
Fuels										
Coal—sold and used tons	796,413	5,937,860	690,011	5,472,064	788,658	5,242,223	919,142	6,802,134	825,339	6,133,986
Crude oil bbl.	513,718	1,009,609	864,750	1,573,227	867,873	1,531,049	1,015,568	1,900,104	8,904,938	16,827,118
Field condensate bbl.	----------	----------	----------	----------	----------	----------	159	297	9,621	18,184
Plant condensate bbl.	590,079	380,072	895,784	367,797	750,848	459,741	813,565	737,761	837,824	674,644
Natural gas delivered to pipe-line M s.c.f.	58,039,491	3,368,327	64,525,633	3,928,839	80,115,399	7,101,949	95,967,110	8,818,891	108,699,997	10,226,323
Butane bbl.	81,609	26,115	207,029	66,249	293,368	93,878	321,706	102,946	387,558	124,019
Propane bbl.	69,095	22,110	96,925	31,016	125,091	40,029	163,079	52,185	216,995	69,438
Totals	----------	10,744,093	----------	11,439,192	----------	14,468,869	----------	18,414,318	----------	34,073,712
Provincial totals	----------	144,953,549	----------	147,651,217	----------	177,365,333	----------	179,807,321	----------	229,371,484

Description	1963		1964		1965		1966		1967	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Metals		$		$		$		$		$
Antimony lb.	1,601,253	624,489	1,591,523	700,270	1,301,787	689,947	1,405,681	745,011	1,267,686	671,874
Bismuth lb.	157,099	348,760	213,428	480,213	144,630	446,907	47,435	198,848	142,507	572,878
Cadmium lb.	1,981,004	4,754,410	1,864,255	6,040,186	466,586	1,297,110	1,169,570	3,017,491	994,365	2,784,222
Copper lb.	118,247,104	36,238,007	115,554,700	38,609,136	85,197,073	32,696,081	105,800,568	56,438,255	172,739,548	88,135,172
Gold—placer, crude oz.	4,620	135,411	1,842	55,191	866	25,053	1,535	44,632	891	25,632
„ —lode, fine oz.	154,979	5,850,458	138,487	5,227,884	117,124	4,419,089	119,508	4,506,646	126,157	4,763,688
Iron concentrates tons	2,060,241	20,746,424	2,012,562	20,419,487	2,165,403	21,498,581	2,151,804	20,778,934	2,154,443	20,820,765
Lead lb.	314,974,310	37,834,714	268,737,503	39,402,293	250,183,633	43,149,171	211,490,107	34,436,934	208,131,894	31,432,079
Mercury lb.	———	———	5,548	22,848	1,520	12,301	———	———	380	2,600
Molybdenum lb.	———	———	28,245	47,063	7,289,125	12,405,344	17,094,927	27,606,061	17,517,348	31,249,772
Nickel lb.	3,699,402	3,107,498	3,398,560	2,854,790	3,322,000	2,790,480	3,622,400	3,104,397	4,180,842	3,946,715
Platinum oz.	2	150	———	———	———	———	———	———	———	———
Silver oz.	6,422,680	8,861,050	5,269,642	7,348,938	4,972,084	6,929,793	5,549,131	7,729,939	6,180,739	10,328,695
Tin lb.	927,062	648,943	352,350	535,572	377,207	735,554	710,752	1,130,096	437,804	621,682
Zinc lb.	402,863,154	53,069,163	400,796,562	58,648,561	311,249,250	48,666,933	305,124,440	47,666,540	262,830,908	39,248,539
Others ———	———	633,389	———	533,897	———	1,339,389	———	1,632,747	———	1,327,713
Totals ———	———	172,852,866	———	180,926,329	———	177,101,733	———	209,036,531	———	235,932,026
Industrial Minerals										
Asbestos tons	63,215	11,681,337	67,460	11,714,494	85,851	14,491,195	88,771	15,718,741	92,192	18,273,220
Barite tons	8,207	69,588	10,588	119,370	17,466	182,931	21,888	176,240	23,466	176,882
Diatomite tons	458	16,030	1,143	64,555	82	4,420	70	3,755	2,819	14,096
Fluorspar tons	———	———	———	———	70	2,419	152	4,986	80	2,464
Fluxes (quartz, limestone) tons	60,490	223,012	73,021	237,298	59,231	240,076	23,913	112,314	48,052	221,212
Granules (quartz, limestone, granite) tons	19,444	348,543	19,289	397,639	29,033	447,954	23,956	424,667	31,283	305,655
Gypsum and products tons	160,954	482,862	188,303	581,873	207,858	602,788	206,026	576,873	230,044	691,592
Jade lb.	16,000	15,529	11,537	13,804	7,129	9,249	11,633	13,225	20,160	24,341
Sulphur tons	254,197	3,673,997	278,385	3,860,436	341,873	4,428,617	342,478	5,834,523	314,490	9,654,603
Totals ———	———	16,510,898	———	16,989,469	———	20,409,649	———	22,865,324	———	29,364,065
Structural Materials										
Brick—common No.	1,086,688	63,499	614,288	49,826	582,305	27,662	288,234	16,956	45,879	2,628
„ —other ———	———	1,050,543	———	872,166	———	1,329,849	———	1,816,845	———	1,817,289
Clays tons	2,573	33,151	1,853	38,585	454	18,234	1,282	34,861	444	18,668
Structural and drain tile ———	———	877,578	———	1,102,341	———	1,361,227	———	1,063,333	———	892,485
Pottery and other clay products ———	———	799,812	———	945,240	———	1,162,662	———	1,168,197	———	1,214,137
Cement tons	476,071	8,546,768	537,396	10,040,776	601,878	11,199,607	707,506	15,959,293	708,855	16,929,451
Lime and limestone tons	907,203	1,723,796	1,211,320	2,055,195	1,420,085	2,482,451	1,483,949	2,696,011	1,645,253	2,822,138
Rubble, riprap, crushed rock tons	1,913,906	1,259,002	1,449,449	1,285,318	2,715,411	1,938,088	1,590,189	1,890,992	2,287,407	2,967,195
Sand and gravel tons	17,387,026	9,514,095	17,708,225	10,013,970	20,936,994	12,686,959	24 320,013	21,959,733	23,210,746	20,643,673
Stone tons	1,827	13,946	846	25,522	2,252	118,975	76,720	215,043	3,577	51,425
Totals ———	———	23,882,190	———	26,428,939	———	32,325,714	———	46,821,264	———	47,359,089
Fuels										
Coal—sold and used tons	850,541	6,237,997	911,326	6,327,678	950,763	6,713,590	850,821	6,196,219	908,790	7,045,341
Crude oil bbl.	12,515,137	24,900,381	11,525,476	23,396,716	13,470,757	28,693,662	16,638,181	36,268,683	19,656,799	44,748,477
Field condensate bbl.	13,671	27,205	26,367	63,436	31,782	70,874	39,571	86,265	40,570	92,357
Plant condensate bbl.	841,740	536,193	922,211	587,685	947,429	576,107	974,564	312,360	1,016,045	267,941
Natural gas delivered to pipe-line M s.c.f.	105,525,373	10,719,298	118,959,880	12,192,816	138,814,144	14,493,255	161,264,334	17,339,587	198,626,177	21,667,136
Butane bbl.	409,087	130,908	461,759	147,763	477,990	152,956	500,973	160,312	588,118	188,197
Propane bbl.	205,162	65,651	244,804	78,337	358,776	114,808	334,315	106,980	413,058	132,178
Totals ———	———	42,617,633	———	42,794,431	———	50,815,252	———	60,470,406	———	74,141,627
Provincial totals ———	———	255,863,587	———	267,139,168	———	280,652,348	———	339,193,525	———	386,796,807

TABLE 4.—MINERAL PRODUCTION OF BRITISH COLUMBIA—VALUE, 1887–1967

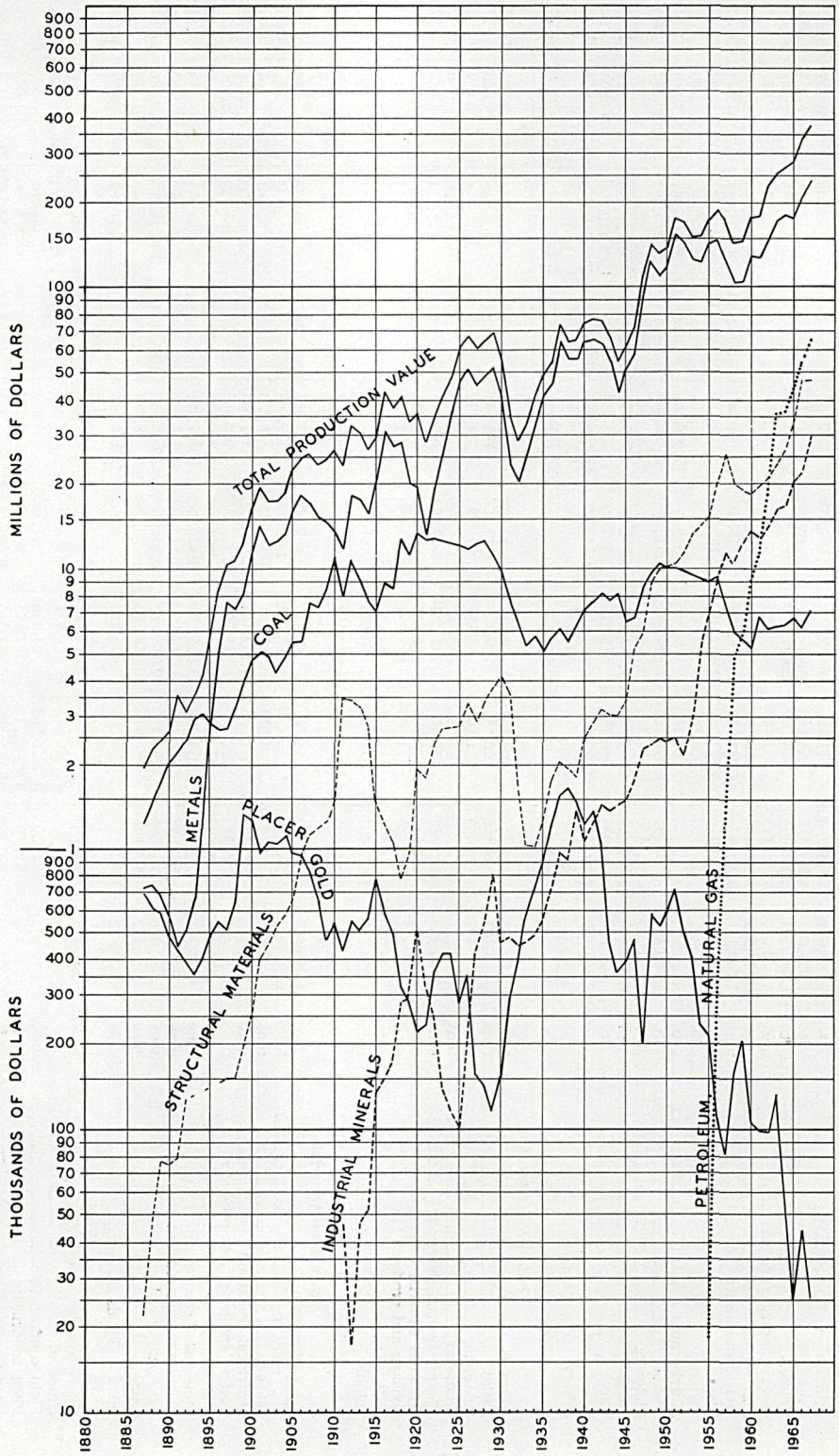


TABLE 5.—MINERAL PRODUCTION OF BRITISH COLUMBIA—QUANTITY, 1897–1967

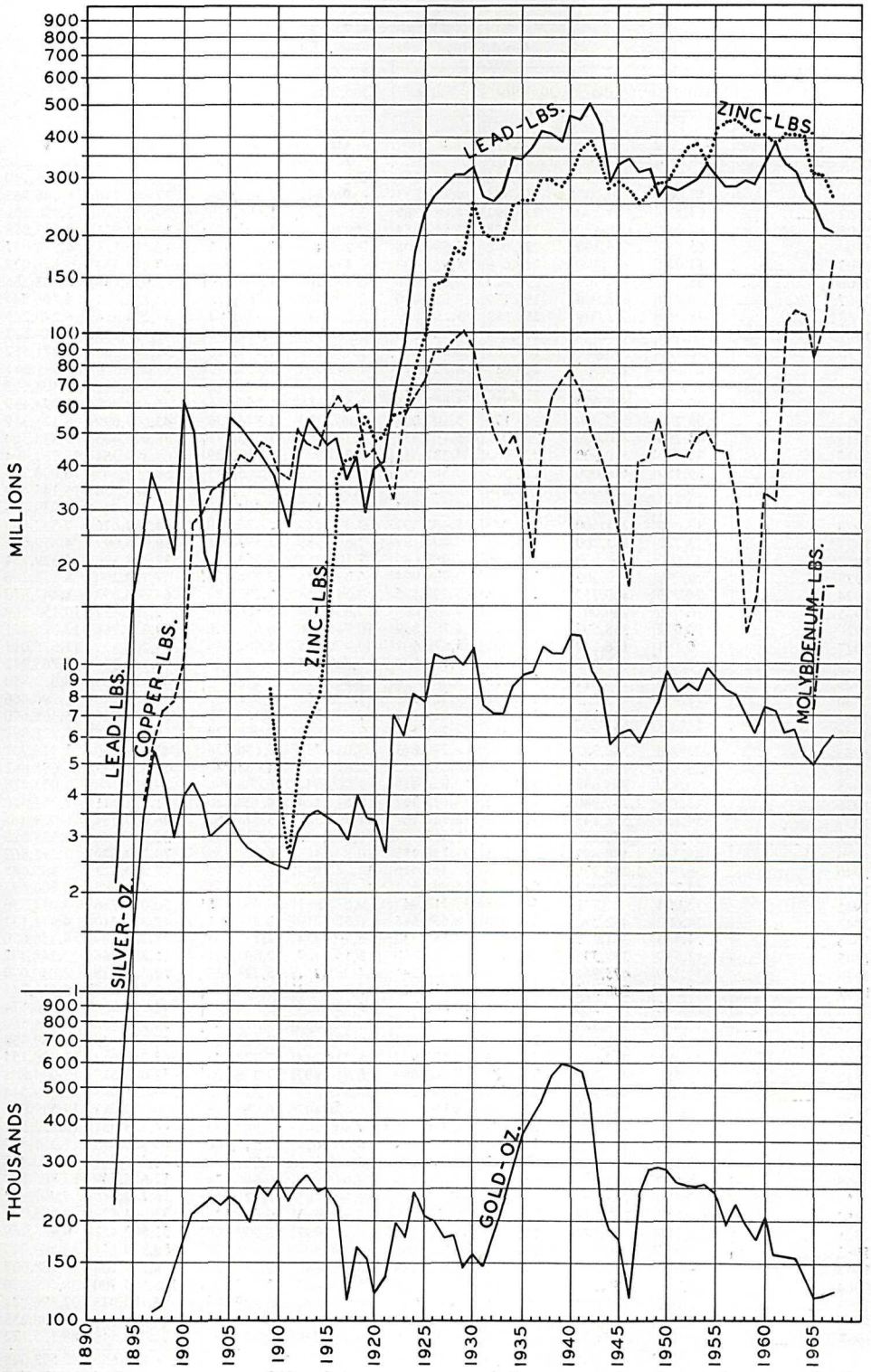


TABLE 6.—PRODUCTION OF GOLD, SILVER, COPPER, LEAD, ZINC, MOLYBDENUM, AND IRON CONCENTRATES, 1858–1967

Year	Placer Gold (Crude)		Gold (Fine)		Silver		Copper	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Oz.	$	Oz.	$	Oz.	$	Lb.	$
1858–90	3,246,585	55,192,163			221,089	214,152		
1891–1900	376,290	6,397,183	632,806	12,858,353	22,537,306	13,561,194	35,416,069	4,365,210
1901	57,060	970,100	210,384	4,348,637	4,396,447	2,462,008	27,603,746	4,446,963
1902	63,130	1,073,140	236,491	4,888,269	3,817,917	1,891,779	29,652,043	3,450,291
1903	62,380	1,060,420	232,828	4,812,554	2,996,204	1,521,472	34,359,921	4,547,878
1904	65,610	1,115,300	222,042	4,589,608	3,222,481	1,719,516	35,710,128	4,578,037
1905	57,020	969,300	238,660	4,933,103	3,439,417	1,971,818	37,692,251	5,876,222
1906	55,790	948,400	224,027	4,630,639	2,990,262	1,897,320	42,990,488	8,288,565
1907	48,710	828,000	196,179	4,055,020	2,745,448	1,703,825	40,832,721	8,166,544
1908	38,060	647,000	255,582	5,282,879	2,631,389	1,321,483	47,274,614	6,240,249
1909	28,060	477,000	238,224	4,924,090	2,532,742	1,239,270	45,597,245	5,918,522
1910	31,760	540,000	267,701	5,533,380	2,450,241	1,245,016	38,243,934	4,871,512
1911	25,060	426,000	228,617	4,725,512	1,892,364	958,293	36,927,656	4,571,644
1912	32,680	555,500	257,496	5,322,442	3,132,108	1,810,045	51,456,537	8,408,513
1913	30,000	510,000	272,254	5,627,595	3,465,856	1,968,606	46,460,305	7,094,489
1914	33,240	565,000	247,170	5,109,008	3,602,180	1,876,736	45,009,699	6,121,319
1915	45,290	770,000	250,021	5,167,934	3,366,506	1,588,991	56,918,405	9,835,500
1916	34,150	580,500	221,932	4,587,333	3,301,923	2,059,739	65,379,364	17,784,494
1917	29,180	496,000	114,523	2,367,191	2,929,216	2,265,749	59,007,565	16,038,256
1918	18,820	320,000	164,674	3,403,811	3,998,172	3,215,870	61,483,754	15,143,449
1919	16,850	286,500	152,426	3,150,644	3,403,119	3,592,673	42,459,339	7,939,896
1920	13,040	221,600	120,048	2,481,392	3,377,849	3,235,980	44,887,676	7,832,899
1921	13,720	233,200	135,765	2,804,197	2,673,389	1,591,201	39,036,993	4,879,624
1922	21,690	368,800	197,856	4,089,684	7,101,311	4,554,781	32,359,896	4,329,754
1923	24,710	420,000	179,245	3,704,994	6,032,986	3,718,129	57,720,290	8,323,266
1924	24,750	420,750	247,716	5,120,535	8,341,768	5,292,184	64,845,393	8,442,870
1925	16,476	280,092	209,719	4,335,069	7,654,844	5,286,818	72,306,432	10,153,269
1926	20,912	355,503	201,427	4,163,859	10,748,556	6,675,606	89,339,768	12,324,421
1927	9,191	156,247	178,001	3,679,601	10,470,185	5,902,043	89,202,871	11,525,011
1928	8,424	143,208	180,662	3,734,609	10,627,167	6,182,461	97,908,316	14,265,242
1929	6,983	118,711	145,223	3,002,020	9,960,172	5,278,194	102,793,669	18,612,850
1930	8,955	152,235	160,836	3,324,975	11,328,263	4,322,185	92,362,240	11,990,466
1931	17,176	291,992	146,133	3,020,837	7,550,331	2,254,979	64,134,746	5,365,690
1932	20,400	395,542	181,651	4,263,389	7,150,655	2,264,729	50,608,036	3,228,892
1933	23,928	562,787	223,589	6,394,645	7,021,754	2,656,526	43,149,460	3,216,701
1934	25,181	714,431	297,216	10,253,952	8,613,977	4,088,280	49,651,733	3,683,662
1935	30,929	895,058	365,343	12,856,419	9,269,944	6,005,996	39,428,208	3,073,428
1936	43,389	1,249,940	404,578	14,172,367	9,547,124	4,308,330	21,671,711	2,053,828
1937	54,153	1,558,245	460,781	16,122,767	11,305,367	5,073,962	46,057,584	6,023,411
1938	57,759	1,671,015	557,522	19,613,624	10,861,578	4,722,288	65,769,906	6,558,575
1939	49,746	1,478,492	587,336	21,226,957	10,821,393	4,381,365	73,254,679	7,392,862
1940	39,067	1,236,928	583,524	22,461,516	12,327,944	4,715,315	77,980,223	7,865,085
1941	43,775	1,385,962	571,026	21,984,501	12,175,700	4,658,545	66,435,583	6,700,693
1942	32,904	1,041,772	444,518	17,113,943	9,677,881	4,080,775	50,097,716	5,052,856
1943	14,600	462,270	224,403	8,639,516	8,526,310	3,858,496	42,307,510	4,971,132
1944	11,433	361,977	186,632	7,185,332	5,705,334	2,453,293	36,300,589	4,356,070
1945	12,589	398,591	175,373	6,751,860	6,157,307	2,893,934	25,852,366	3,244,472
1946	15,729	475,361	117,612	4,322,241	6,365,761	5,324,959	17,500,538	2,240,070
1947	6,969	200,585	243,282	8,514,870	5,708,461	4,110,092	41,783,921	8,519,741
1948	20,332	585,200	286,230	10,018,050	6,720,134	5,040,101	43,025,388	9,616,174
1949	17,886	529,524	288,396	10,382,256	7,637,882	5,671,082	54,856,808	10,956,550
1950	19,134	598,717	283,983	10,805,553	9,509,456	7,667,950	42,212,133	9,889,458
1951	23,691	717,911	261,274	9,627,947	8,218,914	7,770,983	43,249,658	11,980,155
1952	17,554	494,756	255,789	8,765,889	8,810,807	7,326,803	42,005,512	13,054,893
1953	14,245	403,230	253,552	8,727,294	8,378,819	7,019,272	49,021,013	14,869,544
1954	8,684	238,967	258,388	8,803,279	9,826,403	8,154,145	50,150,087	14,599,693
1955	7,666	217,614	242,477	8,370,306	7,903,149	6,942,995	44,238,031	16,932,549
1956	3,865	109,450	191,743	6,603,628	8,405,074	7,511,866	43,360,575	17,251,872
1957	2,936	80,990	223,403	7,495,170	8,129,348	7,077,166	31,387,441	8,170,465
1958	5,650	157,871	194,354	6,604,149	7,041,058	6,086,854	12,658,649	2,964,529
1959	7,570	208,973	173,146	5,812,511	6,198,101	5,421,417	16,233,546	4,497,991
1960	3,847	107,418	205,580	6,979,441	7,446,643	6,600,183	33,064,429	9,583,724
1961	3,416	99,884	159,821	5,667,253	7,373,997	6,909,140	31,692,412	8,965,149
1962	3,315	96,697	158,850	5,942,101	6,189,804	7,181,907	108,979,144	33,209,215
1963	4,620	135,411	154,979	5,850,458	6,422,680	8,861,050	118,247,104	36,238,007
1964	1,842	55,191	138,487	5,227,884	5,269,642	7,348,938	115,554,700	38,609,136
1965	866	25,053	117,124	4,419,089	4,972,084	6,929,793	85,197,073	32,696,081
1966	1,535	44,632	119,508	4,506,646	5,549,131	7,729,939	105,800,568	56,438,255
1967	891	25,632	126,157	4,763,688	6,180,739	10,328,695	172,739,548	88,135,172
Totals	5,233,848	96,911,921	16,684,295	491,030,265	465,859,503	313,557,280	3,718,897,656	788,573,005

TABLE 6.—PRODUCTION OF GOLD, SILVER, COPPER, LEAD, ZINC, MOLYBDENUM, AND IRON CONCENTRATES, 1858–1967—*Continued*

Year	Lead		Zinc		Molybdenum		Iron Concentrates	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Lb.	$	Lb.	$	Lb.	$	Tons	$
1858–90	1,044,400	45,527					29,869	70,879
1891–1900	205,037,158	7,581,619					13,029	45,602
1901	51,582,906	2,010,186					5,746	20,111
1902	22,536,381	824,832					10,017	35,060
1903	18,089,283	689,744					2,290	8,015
1904	36,646,244	1,421,874						
1905	56,580,703	2,399,022		139,200				
1906	52,408,217	2,667,578		17,100				
1907	47,738,703	2,291,458		46,100			1,500	5,250
1908	43,195,733	1,632,799		99,296				
1909	44,396,346	1,709,259	8,500,000	400,000				
1910	34,658,746	1,386,350	4,184,192	192,473				
1911	26,872,397	1,069,521	2,634,544	129,092				
1912	44,871,454	1,805,627	5,358,280	316,139				
1913	55,364,677	2,175,832	6,758,768	324,421				
1914	50,625,048	1,771,877	7,866,467	346,125	1,987	662		
1915	46,503,590	1,939,200	12,982,440	1,460,524	3,618	2,000		
1916	48,727,516	3,007,462	37,168,980	4,043,985	12,342	20,560		
1917	37,307,465	2,951,020	41,848,513	3,166,259	6,982	11,636		
1918	43,899,661	2,928,107	41,772,916	2,899,040	960	1,840	1,000	5,000
1919	29,475,968	1,526,855	56,737,651	3,540,429			1,230	6,150
1920	39,331,218	2,816,115	47,208,268	3,077,979			1,472	7,360
1921	41,402,288	1,693,354	49,419,372	1,952,065			1,010	5,050
1922	67,447,985	3,480,306	57,146,548	2,777,322			1,200	3,600
1923	96,663,152	6,321,770	58,344,462	3,278,903			243	1,337
1924	170,384,481	12,415,917	79,130,970	4,266,741				
1925	237,899,199	18,670,329	98,257,099	7,754,450				
1926	263,023,936	17,757,535	142,876,947	10,586,610				
1927	282,996,423	14,874,292	145,225,443	8,996,135				
1928	305,140,792	13,961,412	181,763,147	9,984,613			20	
1929	307,999,153	15,555,189	172,096,841	9,268,792				
1930	321,803,725	12,638,198	250,479,310	9,017,005				
1931	261,902,228	7,097,812	202,071,702	5,160,911				
1932	252,007,574	5,326,432	192,120,091	4,621,641				
1933	271,689,217	6,497,719	195,963,751	6,291,416				
1934	347,366,967	8,461,859	249,152,403	7,584,199				
1935	344,268,444	10,785,930	256,239,446	7,940,860				
1936	377,971,618	14,790,028	254,581,393	8,439,373				
1937	419,118,371	21,417,049	291,192,278	14,274,245				
1938	412,979,182	13,810,024	298,497,295	9,172,822				
1939	378,743,663	12,002,390	278,409,102	8,544,375				
1940	466,849,112	15,695,467	312,020,671	10,643,026				
1941	456,840,454	15,358,976	367,869,579	12,548,031				
1942	507,199,704	17,052,054	387,236,469	13,208,636				
1943	439,155,635	16,485,902	336,150,455	13,446,018				
1944	292,922,888	13,181,530	278,063,373	11,956,725				
1945	336,976,468	16,848,823	294,791,635	18,984,581				
1946	345,862,680	23,345,731	274,269,956	21,420,484				
1947	313,733,089	42,887,313	253,006,168	28,412,593				
1948	320,037,525	57,734,770	270,310,195	37,654,211			679	3,735
1949	265,378,899	41,929,866	288,225,368	38,181,214			5,472	27,579
1950	284,024,522	41,052,905	290,344,227	43,769,392				
1951	273,456,604	50,316,015	337,511,324	67,164,754			113,535	790,000
1952	284,949,396	45,936,692	372,871,717	59,189,656			900,481	5,474,924
1953	297,634,712	39,481,244	382,300,862	40,810,618			991,248	6,763,105
1954	332,474,456	45,482,505	334,124,560	34,805,755			535,746	3,733,891
1955	302,567,640	45,161,245	429,198,565	52,048,909			610,930	3,228,756
1956	283,718,073	44,702,619	443,853,004	58,934,801			369,955	2,190,847
1957	281,603,346	39,568,086	449,276,797	50,206,681			357,342	2,200,637
1958	294,573,159	34,627,075	432,002,790	43,234,839			630,271	4,193,442
1959	287,423,357	33,542,306	402,342,850	44,169,198			849,248	6,363,848
1960	333,608,699	38,661,912	403,399,319	50,656,726	5,414	9,500	1,160,355	10,292,847
1961	384,284,524	42,313,569	387,951,190	45,370,891			1,335,068	12,082,540
1962	335,282,537	34,537,454	413,430,817	51,356,376			1,793,847	18,326,911
1963	314,974,310	37,834,714	402,863,154	53,069,163			2,060,241	20,746,424
1964	268,737,503	39,402,293	400,796,562	58,648,561	28,245	47,063	2,002,562	20,419,487
1965	250,183,633	43,149,171	311,249,250	48,666,933	7,289,125	12,405,344	2,165,403	21,498,581
1966	211,490,107	34,436,934	305,124,440	47,666,540	17,094,927	27,606,061	2,151,804	20,778,934
1967	208,131,894	31,432,079	262,830,908	39,248,539	17,517,348	31,249,772	2,154,443	20,820,765
Totals	15,171,777,138	1,246,368,659	13,549,404,824	1,255,584,491	41,960,948	71,354,438	20,257,256	180,150,667

TABLE 7A.—PRODUCTION, 1966 AND 1967, AND

Division	Period	Placer Gold		Metals	Industrial Minerals	Structural Materials
		Quantity (Crude)	Value			
		Oz.	$	$	$	$
Alberni	1966			6,745,495		174,161
	1967			**12,878,212**		**417,822**
	To date	1,617	33,253	65,773,468	9,398	2,267,649
Atlin	1966	19	556	4		6,038
	1967	**85**	**2,529**	**22**		**12,844**
	To date	735,713	17,386,199	38,047,133	20,325	330,891
Cariboo	1966	622	17,163	6,504,568	3,755	1,619,973
	1967	**613**	**17,478**	**5,570,941**	**14,096**	**856,015**
	To date	2,609,164	54,128,080	57,061,739	301,646	10,146,368
Clinton	1966					56,498
	1967					**515,846**
	To date	10,171	243,069	848,377	162,427	760,191
Fort Steele	1966			55,650,951	1,865,100	304,305
	1967			**49,837,128**	**3,293,298**	**335,094**
	To date	20,531	468,450	1,984,139,159	13,758,869	6,298,071
Golden	1966			1,716,665	753,113	381,964
	1967			**1,710,318**	**868,474**	**141,842**
	To date	469	11,268	60,369,735	8,728,241	2,451,858
Greenwood	1966			6,863,121		156,704
	1967			**7,249,851**		**207,946**
	To date	5,074	115,662	156,913,601	2,323,897	1,321,137
Kamloops	1966			14,861,062		1,040,519
	1967			**20,466,017**		**1,236,825**
	To date	27,595	604,785	61,996,575	6,528,308	13,889,417
Liard	1966			124	17,443,990	641,364
	1967				**20,403,509**	**520,891**
	To date	50,184	1,248,151	6,522	145,882,187	4,597,221
Lillooet	1966	836	25,356	1,641,589	4,577	143,010
	1967	**118**	**3,661**	**1,856,414**	**4,627**	**52,038**
	To date	92,870	1,923,321	142,226,659	103,476	2,539,910
Nanaimo	1966			19,692,301	68,786	3,561,079
	1967			**17,479,327**	**110,057**	**3,212,674**
	To date	866	19,300	152,219,600	1,144,357	49,167,615
Nelson	1966			16,505,791	118,368	427,106
	1967	**1**	**38**	**8,339,265**		**427,580**
	To date	3,586	89,026	311,172,204	485,859	4,653,071
New Westminster	1966			3,930,536	50,000	8,398,108
	1967	**14**	**189**	**4,803,044**	**62,000**	**8,819,722**
	To date	31,279	593,762	31,503,328	1,277,256	112,374,054
Nicola	1966			17,660,303		134,219
	1967			**29,968,349**		**124,980**
	To date	234	4,764	121,171,508	10,050	826,256
Omineca	1966			22,362,413		998,139
	1967	**10**	**302**	**37,709,824**		**1,625,385**
	To date	56,289	1,499,482	103,097,546	15,860	7,807,533
Osoyoos	1966				304,673	394,683
	1967			**743,805**	**357,134**	**256,324**
	To date	240	5,466	51,884,290	5,919,571	2,025,661
Revelstoke	1966					48,083
	1967			**7,173**		**492,331**
	To date	7,582	164,477	11,244,631		2,032,784
Similkameen	1966					279,687
	1967					**116,968**
	To date	45,507	878,204	120,195,258	18,558	3,253,932
Skeena	1966			5,643,654		592,571
	1967			**7,075,817**		**928,616**
	To date	4,603	105,569	235,028,160	1,229,400	10,028,873
Slocan	1966			9,275,129		86,049
	1967			**7,873,945**		**84,101**
	To date	366	9,397	237,763,482		1,342,476
Trail Creek	1966			745,213		250,614
	1967			**1,204,469**		**228,604**
	To date	851	24,260	85,701,433		2,639,937
Vancouver	1966			5,339,748	40,322	10,193,600
	1967			**6,669,215**	**122,640**	**10,745,614**
	To date	182	5,306	239,177,359	6,733,153	91,632,989
Vernon	1966			664		271,748
	1967			**10,695**		**659,442**
	To date	2,732	72,885	209,230	3,978	4,033,847
Victoria	1966			992,729	140	10,330,132
	1967			**1,523,437**	**140**	**9,879,862**
	To date	628	15,680	15,444,922	188,791	159,091,569
Not assigned	1966	58	1,557	12,859,839	2,212,500	6,330,910
	1967	**50**	**1,435**	**12,929,126**	**4,128,090**	**5,459,723**
	To date	1,525,515	17,262,105	251,544,472	46,113,975	27,852,296
Totals	1966	1,535	44,632	208,991,899	22,865,324	46,821,264
	1967	**891**	**25,632**	**235,906,394**	**29,364,065**	**47,359,089**
	To date	5,233,848	96,911,921	4,534,740,391	240,959,582	523,365,606

TOTAL TO DATE, BY MINING DIVISIONS—SUMMARY

Fuels								Division Total
Coal		Crude Oil and Condensates		Natural Gas Delivered to Pipe-line		Butane and Propane		
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	
Tons	$	Bbl.	$	M S.C.F.	$	Bbl.	$	$
								6,919,656
								13,296,034
								68,083,768
								6,598
								15,395
								55,784,548
								8,145,459
								6,458,530
290	1,100							121,638,933
								56,498
								515,846
								2,014,064
823,350	5,919,353							63,739,709
895,429	**6,939,184**							**60,404,704**
58,169,961	266,597,688							2,271,262,237
								2,851,742
								2,720,634
								71,561,102
								7,019,825
								7,457,797
								160,674,297
								15,901,581
								21,702,842
15,087	59,765							83,078,850
		17,652,316	36,667,308	161,264,334	17,339,587	835,288	267,292	72,359,665
		20,713,414	**45,108,775**	**198,626,177**	**21,667,136**	**1,001,176**	**320,375**	**88,020,686**
99,433	699,521	95,247,347	187,171,497	1,139,229,860	110,335,069	5,956,497	1,906,076	451,846,244
								1,814,532
								1,916,740
								146,793,366
15,496	169,091							23,491,257
374	**5,362**							**20,807,420**
74,324,378	301,143,250							503,694,122
								17,051,265
								8,766,883
								316,400,160
								12,378,644
								13,684,955
								145,748,400
								17,794,522
								30,093,329
2,929,584	11,080,836							133,093,414
11,975	107,775							23,468,327
12,987	**100,795**							**39,436,306**
476,159	3,176,723							115,597,144
								699,356
								1,357,263
1,122	5,008							59,839,996
								48,083
								499,504
								13,441,892
								279,687
								116,968
4,617,442	19,553,725							143,899,677
								6,236,225
								8,004,433
36	116							246,392,118
								9,361,178
								7,958,046
								239,115,355
								995,827
								1,433,073
								88,365,630
								15,573,670
								17,537,469
								337,548,807
								272,412
								670,137
								4,319,940
								11,323,001
								11,403,439
								174,740,962
								21,404,806
								22,518,374
								342,772,848
850,821	6,196,219	17,652,316	36,667,308	161,264,334	17,339,587	835,288	267,292	339,193,525
908,790	**7,045,341**	**20,713,414**	**45,108,775**	**198,626,177**	**21,667,136**	**1,001,176**	**320,375**	**386,796,807**
140,633,492	602,317,732	95,247,347	187,171,497	1,139,229,860	110,335,069	5,956,497	1,906,076	6,297,707,874

TABLE 7B.—PRODUCTION, 1966 AND 1967, AND TOTAL TO DATE, BY MINING DIVISIONS—LODE GOLD, SILVER, COPPER, LEAD, AND ZINC

Division	Period	Lode Gold		Silver		Copper		Lead		Zinc		Division Total
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	
		Oz.	$	Oz.	$	Lb.	$	Lb.	$	Lb.	$	$
Alberni	1966	1	38	14	20	1,818	970					1,028
	1967	**10,902**	**411,660**	**402,095**	**671,945**	**8,120,718**	**4,143,353**	**795,547**	**120,144**	**24,168,908**	**3,609,143**	**8,956,245**
	To date	314,660	11,776,685	564,793	751,018	10,413,235	4,487,841	916,891	125,563	24,168,975	3,609,151	20,750,258
Atlin	1966			3	4							4
	1967			**13**	**22**							**22**
	To date	344,197	12,126,732	3,377,099	2,895,609	24,777,661	8,160,266	23,765,211	3,437,907	91,067,749	10,864,497	37,485,011
Cariboo	1966	20,312	765,966	3,476	4,842							770,808
	1967	**5,481**	**206,963**	**1,044**	**1,744**							**208,707**
	To date	1,202,251	43,347,296	146,678	108,792	2,352	920	24,560	3,724	505	19	43,460,751
Clinton	1966											
	1967											
	To date	23,390	827,328	31,586	14,237	57,548	5,905	193	7			847,477
Fort Steele	1966	226	8,522	3,099,543	4,317,663			164,266,495	26,747,513	136,493,338	21,322,989	52,396,687
	1967	**162**	**6,117**	**3,073,082**	**5,135,458**			**157,039,309**	**23,716,075**	**121,470,665**	**18,139,214**	**46,996,864**
	To date	7,025	216,767	227,693,011	148,173,665	28,592	6,193	12,730,795,707	1,005,888,225	9,473,792,111	803,806,530	1,958,091,380
Golden	1966			46,299	64,494	3,244	1,730	3,160,034	514,548	6,856,694	1,071,153	1,651,925
	1967			**51,266**	**85,671**			**3,527,550**	**532,731**	**6,892,277**	**1,029,224**	**1,647,626**
	To date	170	4,882	4,121,184	3,505,562	1,171,455	367,261	253,450,684	25,201,523	317,396,116	30,236,190	59,315,418
Greenwood	1966	14,702	554,412	841,432	1,172,115	9,087,920	4,847,860	1,024,939	166,891	705,324	110,186	6,851,464
	1967	**14,786**	**558,319**	**810,534**	**1,354,491**	**9,964,959**	**5,084,321**	**974,752**	**147,207**	**643,853**	**96,147**	**7,240,485**
	To date	1,264,334	29,215,379	38,977,054	27,871,181	508,364,201	95,667,492	21,413,084	2,023,802	22,117,055	1,972,055	156,749,909
Kamloops	1966	503	18,968	97,798	136,233	27,532,516	14,686,945					14,842,146
	1967	**1,627**	**61,436**	**150,158**	**250,931**	**39,499,922**	**20,153,650**					**20,466,017**
	To date	57,593	1,975,411	855,548	990,837	139,690,798	58,715,346	538,097	45,030	438,023	29,826	61,756,450
Liard	1966			39	54			319	52	115	18	124
	1967											
	To date	114	4,120	587	507	56	22	10,421	1,776	115	18	6,443
Lillooet	1966	43,222	1,629,902	8,390	11,687							1,641,589
	1967	**48,711**	**1,839,327**	**8,669**	**14,487**							**1,853,814**
	To date	4,027,027	141,473,980	960,010	663,989	400	41	62,513	2,548	15	2	142,140,560
Nanaimo	1966	24,088	908,359	255,355	355,710	20,415,533	10,890,462					12,154,531
	1967	**17,614**	**665,105**	**141,749**	**236,878**	**14,181,288**	**7,235,577**					**8,137,560**
	To date	186,812	5,780,866	1,392,088	1,465,360	107,913,815	38,903,419					46,149,645
Nelson	1966	1,137	42,876	125,311	174,558			19,498,654	3,174,966	76,631,663	11,971,398	15,363,798
	1967	**1,378**	**52,033**	**111,865**	**186,939**			**13,629,659**	**2,058,352**	**36,404,069**	**5,436,220**	**7,733,544**
	To date	1,337,651	41,864,270	9,038,258	6,116,252	14,915,405	1,689,196	456,208,897	56,973,778	1,200,946,401	156,343,974	262,987,470
New Westminster	1966					1,548,700	826,139					826,139
	1967			**1**	**2**	**1,678,348**	**856,327**					**856,329**
	To date	4,466	114,164	15,115	7,722	13,901,697	5,005,857	28,425	1,119	12,755	481	5,129,343
Nicola	1966					33,106,447	17,660,303					17,660,303
	1967	**7**	**264**	**854**	**1,427**	**58,732,068**	**29,966,276**	**2,375**	**359**	**154**	**23**	**29,968,349**
	To date	8,548	235,745	276,453	135,632	318,991,111	120,697,872	2,241,499	91,282	323,889	10,977	121,171,508
Omineca	1966	1,423	53,661	23,212	32,334	2,067,930	1,103,117	147,841	24,073	231,923	36,231	1,249,416
	1967	**15,868**	**599,176**	**184,443**	**308,225**	**23,594,882**	**12,038,581**	**293,279**	**44,291**	**396,533**	**59,214**	**13,049,487**
	To date	42,444	1,429,634	9,813,067	7,998,801	32,410,874	14,687,723	28,738,531	3,664,352	32,511,198	4,050,079	31,830,589

		Oz.	$	Oz.	$	Lb.	$	Lb.	$	Lb.	$	$
Osoyoos	1966											
	1967	**892**	**33,682**	**413,715**	**691,363**			**39,609**	**5,982**	**85,567**	**12,778**	**743,805**
	To date	1,656,625	50,347,159	1,013,600	1,091,364	2,843,616	417,190	180,374	13,190	101,731	14,367	51,883,270
Revelstoke	1966											
	1967			**1,223**	**2,044**			**30,894**	**4,666**	**3,103**	**463**	**7,173**
	To date	37,300	1,069,260	4,109,297	2,769,163	153,686	51,037	36,077,602	3,858,032	27,127,076	3,311,895	11,059,387
Similkameen	1966											
	1967											
	To date	184,016	6,327,410	4,219,558	2,582,429	601,197,638	111,137,983	382,677	13,376	78,094	4,874	120,066,072
Skeena	1966	8,199	309,184	165,554	230,617	273	146	43,851	7,140	108,982	17,025	564,112
	1967	**4,341**	**163,916**	**101,871**	**170,238**	**1,192,867**	**608,625**					**942,779**
	To date	2,426,950	61,458,066	69,058,759	44,483,926	690,299,410	98,634,778	60,000,228	5,438,209	17,194,846	2,541,146	212,556,125
Slocan	1966	41	1,546	495,091	689,662			25,059,507	4,080,440	27,103,767	4,234,150	9,005,798
	1967	**38**	**1,435**	**362,646**	**606,021**			**21,367,338**	**3,226,895**	**25,307,760**	**3,779,208**	**7,613,559**
	To date	16,085	466,814	74,756,427	50,103,355	13,662	1,861	1,031,460,552	92,595,494	849,974,195	89,967,380	233,134,904
Trail Creek	1966											
	1967	**13**	**490**	**2**	**3**							**493**
	To date	2,984,561	63,340,024	3,673,072	2,102,507	122,561,732	18,245,404	146,421	12,293	133,571	16,242	83,716,470
Vancouver	1966	3,717	140,168	34,441	47,976	9,017,161	4,810,114	51,194	8,336	2,006,190	313,407	5,320,001
	1967	**3,128**	**118,113**	**44,818**	**74,896**	**12,459,529**	**6,357,101**	**8,664**	**1,308**	**729,494**	**108,935**	**6,660,353**
	To date	493,681	15,976,417	5,133,512	3,350,982	1,024,249,621	186,368,409	18,552,603	1,880,670	234,747,488	30,439,735	238,016,213
Vernon	1966	6	226	164	228			1,014	165	286	45	664
	1967			**1,876**	**3,135**			**2,752**	**416**	**44,282**	**6,612**	**10,163**
	To date	5,230	176,308	14,891	11,473	654	100	28,679	3,514	55,384	7,803	199,198
Victoria	1966	400	15,084	3,920	5,461	1,822,480	972,184					992,729
	1967	**460**	**17,370**	**3,224**	**5,388**	**2,941,240**	**1,500,679**					**1,523,437**
	To date	41,580	960,169	916,284	559,568	53,741,646	13,585,977	210,097	19,848	3,568,709	283,923	15,409,485
Not assigned[1]	1966	1,531	57,734	349,089	486,281	1,196,546	638,285	1—1,763,741	1—287,190	54,986,158	8,589,938	9,485,048
	1967	**749**	**28,282**	**315,591**	**527,387**	**373,727**	**190,682**	**10,420,166**	**1,573,653**	**46,684,243**	**6,971,358**	**9,291,362**
	To date	17,585	515,379	5,701,572	5,803,349	51,196,791	11,734,912	506,543,192	45,073,397	1,253,648,823	118,073,327	181,200,364
Totals	1966	119,508	4,506,646	5,549,131	7,729,939	105,800,568	56,438,255	211,490,107	34,436,934	305,124,440	47,666,540	150,778,314
	1967	**126,157**	**4,763,688**	**6,180,739**	**10,328,695**	**172,739,548**	**88,135,172**	**208,131,894**	**31,432,079**	**262,830,908**	**39,248,539**	**173,908,173**
	To date	16,684,295	491,030,265	465,859,503	313,557,280	3,718,897,656	788,573,005	15,171,777,138	1,246,368,659	13,549,404,824	1,255,584,491	4,095,113,700

[1] Metals recovered from operations at the Trail smelter but not assignable to individual mines. The minus quantities for lead and zinc are bookkeeping adjustments between the Trail smelter input and output.

TABLE 7C.—PRODUCTION, 1966 AND 1967, AND TOTAL TO DATE, BY MINING DIVISIONS—MISCELLANEOUS METALS

Division	Period	Antimony		Bismuth		Cadmium		Chromite		Iron Concentrates		Manganese		Mercury	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		Lb.	$	Lb.	$	Lb.	$	Tons	$	Tons	$	Tons	$	Lb.	$
Alberni	1966									644,459	6,744,467				
	1967					**83,852**	**234,786**			**383,035**	**3,687,181**				
	To date					83,852	234,786			4,253,212	44,788,424				
Atlin	1966														
	1967														
	To date					319,212	561,762								
Cariboo	1966														
	1967														
	To date														
Clinton	1966														
	1967														
	To date							126	900						
Fort Steele	1966					274,036	707,013			163,950	1,417,155				
	1967					**189,896**	**531,709**			**172,413**	**1,686,873**				
	To date					1,396,385	4,068,247			727,045	7,082,075				
Golden	1966					25,093	64,740								
	1967					**22,390**	**62,692**								
	To date	40,062	14,906			521,377	1,039,411								
Greenwood	1966					4,518	11,657								
	1967					**3,345**	**9,366**								
	To date					65,548	132,297	670	31,395						
Kamloops	1966														
	1967														
	To date									21,167	95,851			10,987	5,795
Liard	1966														
	1967														
	To date														
Lillooet	1966														
	1967													**380**	**2,600**
	To date	13,466	4,321											9,231	41,304
Nanaimo	1966									808,205	7,537,770				
	1967									**954,735**	**9,341,767**				
	To date									12,857,428	106,069,955				
Nelson	1966					442,633	1,141,993								
	1967					**216,329**	**605,721**								
	To date					7,056,737	14,266,045								
New Westminster	1966														
	1967														
	To date														
Omineca	1966					1,870	4,825								
	1967					**1,739**	**4,869**								
	To date	104,489	15,217			268,650	536,137							4,150,892	10,400,259
Osoyoos	1966														
	1967														
	To date											16			

		Lb.	$	Lb.	$	Lb.	$	Tons	$	Tons	$	Tons	$	Lb.	$
Revelstoke	1966														
	1967														
	To date	9,394	3,455			103,612	176,102								
Similkameen	1966														
	1967														
	To date														
Skeena	1966									535,190	5,079,542				
	1967									**644,260**	**6,104,944**				
	To date					141,890	316,764			2,397,854	22,112,437				
Slocan	1966					104,392	269,331								
	1967					**92,995**	**260,386**								
	To date	31,865	8,133			2,305,192	4,612,285					541	8,160		
Trail Creek	1966														
	1967														
	To date					115	210			550	1,925				
Vancouver	1966					7,654	19,747								
	1967					**3,165**	**8,862**								
	To date					551,991	1,161,146								
Vernon	1966														
	1967					**190**	**532**								
	To date					190	532								
Victoria	1966														
	1967														
	To date					7,000	10,929					1,167	24,508		
Not assigned[1]	1966	1,405,681	745,011	47,435	198,848	309,374	798,185								
	1967	**1,267,686**	**671,874**	**142,507**	**572,878**	**380,464**	**1,065,299**								
	To date	49,660,550	14,607,886	6,344,049	11,765,019	23,177,880	34,026,989								
Totals	1966	1,405,681	745,011	47,435	198,848	1,169,570	3,017,491			2,151,804	20,778,934				
	1967	**1,267,686**	**671,874**	**142,507**	**572,878**	**994,365**	**2,784,222**			**2,154,443**	**20,820,765**			**380**	**2,600**
	To date	49,859,826	14,653,918	6,344,049	11,765,019	35,999,631	61,143,642	796	32,295	20,257,256	180,150,667	1,724	32,668	4,171,110	10,447,358

[1] Metals recovered from operations at the Trail smelter but not assignable to individual mines.

TABLE 7C.—PRODUCTION, 1966 AND 1967, AND TOTAL TO DATE, BY MINING DIVISIONS—MISCELLANEOUS METALS—*Continued*

Division	Period	Molybdenum		Nickel		Palladium		Platinum		Tin		Tungsten (WO_3)		Other, Value	Division Total
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value		
		Lb.	$	Lb.	$	Oz.	$	Oz.	$	Lb.	$	Lb.	$	$	$
Alberni	1966														6,744,467
	1967														**3,921,967**
	To date														45,023,210
Atlin	1966														
	1967														
	To date														562,122
Cariboo	1966	3,534,893	5,733,760												5,733,760
	1967	**3,106,460**	**5,362,234**												**5,362,234**
	To date	8,256,576	13,577,258												13,600,988
Clinton	1966											292	360		
	1967														
	To date							59	2,299						900
Fort Steele	1966											27,698	21,431		3,254,264
	1967														**2,840,264**
	To date														26,047,779
Golden	1966									710,752	1,130,096				64,740
	1967									**437,804**	**621,682**				**62,692**
	To date									17,274,649	14,809,273				1,054,317
Greenwood	1966														11,657
	1967														**9,366**
	To date														163,692
Kamloops	1966	13,850	18,916											88,1841	18,916
	1967														
	To date	93,995	138,479												240,125
Liard	1966							2	79						
	1967														
	To date							3	113						79
Lillooet	1966														
	1967											32,353	37,921		**2,600**
	To date														86,099
Nanaimo	1966	1,469	2,440												7,537,770
	1967														**9,341,767**
	To date														106,069,955
Nelson	1966														1,141,993
	1967														**605,721**
	To date											13,739,939	33,900,311		48,184,734
New Westminster	1966	15,035	18,378												3,104,397
	1967			3,622,400											**3,946,715**
	To date			**4,180,842**											26,373,985
Omineca	1966			3,104,397											21,112,997
	1967	13,229,852	21,108,172	**3,946,715**											**24,660,337**
	To date	**13,716,016**	**24,655,468**	26,373,985								2,210,892	4,697,710	4202	71,266,957
Osoyoos	1966	32,568,830	55,617,060												
	1967														
	To date	612	1,020					3	154						1,020

		Lb.	$	Lb.	$	Oz.	$	Oz.	$	Lb.	$	Lb.	$	$	$
Revelstoke	1966														
	1967														
	To date											7,784	5,687		185,244
Similkameen	1966														
	1967														
	To date							1,287	129,186						129,186
Skeena	1966														5,079,542
	1967	**16,054**	**28,094**												**6,133,038**
	To date	23,867	41,114									366	331	1,389[3]	22,472,035
Slocan	1966														269,331
	1967														**260,386**
	To date														4,628,578
Trail Creek	1966	316,332	745,213												745,213
	1967	**678,818**	**1,203,976**												**1,203,976**
	To date	995,150	1,949,189			749	30,462	53	3,177						1,984,963
Vancouver	1966														19,747
	1967														**8,862**
	To date														1,161,146
Vernon	1966														
	1967														**532**
	To date	5,414	9,500												10,032
Victoria	1966														
	1967														
	To date														35,437
Not assigned	1966													1,632,747	3,374,791
	1967													**1,327,713**	**3,637,764**
	To date													9,944,214	70,344,108
Totals	1966	17,094,927	27,606,061	3,622,400	3,104,397					710,752	1,130,096			1,632,747	58,213,585
	1967	**17,517,348**	**31,249,772**	**4,180,842**	**3,946,715**					**437,804**	**621,682**			**1,327,713**	**61,998,221**
	To date	41,960,948	71,354,438	32,411,701	26,373,985	749	30,462	1,407	135,008	17,274,649	14,809,273	16,019,324	38,663,751	10,034,207	439,626,691

[1] Magnesium, page A 20. [2] Cobalt, page A 18. [3] Selenium, page A 22.

TABLE 7D.—PRODUCTION, 1966 AND 1967, AND TOTAL

Division	Period	Asbestos		Barite		Diatomite		Fluxes (Quartz and Limestone)		Granules (Quartz, Limestone, and Granite)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		Tons	$	Tons	$	Tons	$	Tons	$	Tons	$
Alberni	1966										
	1967										
	To date										
Atlin	1966										
	1967										
	To date										
Cariboo	1966					70	3,755				
	1967					**2,819**	**14,096**				
	To date					6,616	158,166			48	168
Clinton	1966										
	1967										
	To date										
Fort Steele	1966										
	1967										
	To date			8	80						
Golden	1966			21,888	176,240						
	1967			**23,466**	**176,882**						
	To date			275,734	3,118,951			3,259	12,612		
Greenwood	1966										
	1967										
	To date							1,790,502	1,540,319		
Kamloops	1966										
	1967										
	To date										
Liard	1966	88,771	15,718,741								
	1967	**92,192**	**18,273,220**								
	To date	683,422	133,692,993								
Lillooet	1966										
	1967										
	To date										
Nanaimo	1966									3,583	68,786
	1967							**21,836**	**50,057**	**3,300**	**60,000**
	To date							801,933	1,015,571	6,883	128,786
Nelson	1966									4,184	118,368
	1967										
	To date							7,601	8,174	16,668	421,784
New Westminster	1966									3,100	50,000
	1967									**3,700**	**62,000**
	To date									92,547	1,277,256
Nicola	1966										
	1967										
	To date										
Omineca	1966										
	1967										
	To date										
Osoyoos	1966							23,899	112,174	13,089	187,513
	1967							**26,202**	**171,015**	**24,283**	**183,655**
	To date							783,666	3,600,892	146,843	1,987,325
Similkameen	1966										
	1967										
	To date										
Skeena	1966										
	1967										
	To date							601,019	1,050,722		
Vancouver	1966										
	1967										
	To date									29,692	418,606
Vernon	1966										
	1967										
	To date										
Victoria	1966							14	140		
	1967							**14**	**140**		
	To date							124	1,485	9,605	157,080
Not assigned	1966										
	1967										
	To date										
Totals	1966	88,771	15,718,741	21,888	176,240	70	3,755	23,913	112,314	23,956	424,667
	1967	**92,192**	**18,273,220**	**23,466**	**176,882**	**2,819**	**14,096**	**48,052**	**221,212**	**31,283**	**305,655**
	To date	683,422	133,692,993	275,742	3,119,031	6,616	158,166	3,988,104	7,229,775	302,286	4,391,005

Other: *See* notes on individual minerals listed alphabetically on pages A 17 to A 23.

1 Arsenious oxide.
2 Bentonite.
3 Fluorspar.
4 Hydromagnesite.
5 Iron oxide and ochre.
6 Magnesium sulphate.

TO DATE, BY MINING DIVISIONS—INDUSTRIAL MINERALS

Gypsum and Gypsite		Jade		Mica		Sulphur		Other, Value	Division Total
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value		
Tons	$	Lb.	$	Lb.	$	Lb.	$	$	$
								9,3987	9,398
								20,3254	20,325
									3,755
									14,096
				10,013,800	143,012			30012	301,646
873	6,236							156,1914 6 10	162,427
						124,340	1,865,100		1,865,100
						109,777	**3,293,298**		**3,293,298**
112,878	298,824					762,304	13,443,071	16,8949	13,758,869
206,026	576,873								753,113
230,044	**691,592**								**868,474**
1,924,431	5,595,402							1,2765 11	8,728,241
								783,5783	2,323,897
1,246,918	6,323,178			424,700	2,075			203,0556 10	6,528,308
		8,493	8,648			66,461	1,716,601		17,443,990
		14,920	**19,714**			**59,160**	**2,110,575**		**20,403,509**
		25,413	30,362			553,159	12,158,832		145,882,187
		3,140	4,577						4,577
		5,240	**4,627**						**4,627**
		230,832	98,347					5,12911	103,476
									68,786
									110,057
									1,144,357
									118,368
								55,9015	485,859
									50,000
									62,000
									1,277,256
2,407	10,050								10,050
		2,200	4,400					11,4601 8	15,860
								4,9863	304,673
								2,4643	**357,134**
				1,588,800	25,938			305,4161 3 6	5,919,571
250	1,700							16,8582	18,558
						41,624	178,678		1,229,400
						4,177	40,322		40,322
						7,950	**122,640**		**122,640**
				634,250	10,815	654,899	6,206,343	97,3895	6,733,153
				160,500	3,978				3,978
									140
									140
								30,22611	188,791
						147,500	2,212,500		2,212,500
						137,603	**4,128,090**		**4,128,090**
						4,277,411	46,113,975		46,113,975
206,026	576,873	11,633	13,225			342,478	5,834,523	4,986	22,865,324
230,044	**691,592**	**20,160**	**24,341**			**314,490**	**9,654,603**	**2,464**	**29,364,065**
3,287,757	12,235,390	258,445	133,109	12,822,050	185,818	6,289,397	78,100,899	1,713,396	240,959,582

7 Natro-alunite.
8 Perlite.
9 Phosphate rock.
10 Sodium carbonate.
11 Talc.
12 Volcanic ash.

TABLE 7E.—PRODUCTION, 1966 AND 1967, AND TOTAL

Division	Period	Cement	Lime and Limestone	Building-stone	Rubble, Riprap, and Crushed Rock	Sand and Gravel
		$	$	$	$	$
Alberni	1966	.....	.....	.....	19,389	154,772
	1967	.....	.....	.....	**46,100**	**371,722**
	To date	.....	.....	.....	280,611	1,987,038
Atlin	1966	.....	.....	.....	.....	6,038
	1967	.....	.....	.....	.....	**12,844**
	To date	.....	1,108	.....	98,478	231,305
Cariboo	1966	.....	.....	.....	182,939	1,432,024
	1967	.....	**44,616**	.....	**82,251**	**673,248**
	To date	.....	52,116	.....	1,375,545	8,613,920
Clinton	1966	.....	.....	.....	6,772	49,726
	1967	.....	.....	.....	**173,446**	**342,400**
	To date	.....	.....	.....	181,824	578,367
Fort Steele	1966	.....	.....	.....	66,912	237,393
	1967	.....	.....	.....	**92,207**	**242,887**
	To date	.....	43,873	71,941	1,601,099	4,565,240
Golden	1966	.....	.....	24,840	850	356,274
	1967	.....	.....	.....	.....	**114,012**
	To date	.....	1,000	50,840	126,189	2,214,264
Greenwood	1966	.....	.....	16,868	.....	139,836
	1967	.....	.....	**29,646**	**69,764**	**108,536**
	To date	.....	42,560	83,014	241,083	833,197
Kamloops	1966	.....	.....	.....	225,977	814,942
	1967	.....	.....	.....	**337,545**	**899,280**
	To date	.....	12,000	18,000	6,759,565	7,027,473
Liard	1966	.....	.....	.....	50,917	590,447
	1967	.....	.....	.....	**30,292**	**490,599**
	To date	.....	.....	.....	178,215	4,419,006
Lillooet	1966	.....	.....	.....	73,508	69,502
	1967	.....	.....	.....	**29,352**	**22,686**
	To date	.....	100	2,000	710,764	1,827,046
Nanaimo	1966	.....	2,336,751	164,478	127,305	932,545
	1967	.....	**2,359,595**	.....	**121,299**	**731,780**
	To date	.....	38,253,036	3,450,735	1,061,183	5,223,669
Nelson	1966	.....	72,601	3,611	4,838	346,056
	1967	.....	**72,601**	**3,611**	**5,762**	**345,606**
	To date	.....	179,745	420,191	509,589	3,521,572
New Westminster	1966	.....	231,098	.....	312,443	4,315,711
	1967	.....	**321,495**	.....	**701,405**	**4,359,718**
	To date	.....	2,324,577	20,974	10,686,895	48,133,479
Nicola	1966	.....	.....	.....	.....	134,219
	1967	.....	.....	.....	**23,355**	**101,625**
	To date	.....	.....	8,000	156,696	661,560
Omineca	1966	.....	.....	.....	169,711	828,428
	1967	.....	.....	.....	**358,194**	**1,267,191**
	To date	.....	3,077	.....	1,485,578	6,313,604
Osoyoos	1966	.....	.....	.....	44,951	349,732
	1967	.....	.....	**18,168**	**10,500**	**227,656**
	To date	.....	33,784	33,018	208,698	1,750,161
Revelstoke	1966	.....	.....	.....	5,278	42,805
	1967	.....	.....	.....	**13,556**	**478,775**
	To date	.....	1,000	5,575	362,800	1,663,409
Similkameen	1966	.....	.....	.....	64,500	215,187
	1967	.....	.....	.....	**2,280**	**114,688**
	To date	10,500	11,571	24,000	618,049	2,576,457
Skeena	1966	.....	42,061	.....	10,638	539,872
	1967	.....	**11,127**	.....	**612,835**	**304,654**
	To date	.....	1,645,300	144,000	2,451,012	5,775,312
Slocan	1966	.....	.....	.....	.....	86,049
	1967	.....	.....	.....	.....	**84,101**
	To date	.....	1,000	115,143	118,534	1,107,799
Trail Creek	1966	.....	.....	4,036	375	246,203
	1967	.....	.....	.....	**1,800**	**226,804**
	To date	.....	32,500	85,520	226,224	2,295,693
Vancouver	1966	7,020,763	.....	1,200	449,872	2,721,765
	1967	**8,460,929**	.....	.....	**147,049**	**2,137,636**
	To date	43,232,647	40,885	4,012,560	8,105,309	35,152,996
Vernon	1966	.....	.....	.....	6,372	265,376
	1967	.....	.....	.....	**28,678**	**630,764**
	To date	.....	46,499	81,052	277,059	3,467,983
Victoria	1966	8,938,530	13,500	10	2,511	819,255
	1967	**8,468,522**	**12,704**	.....	**4,423**	**969,840**
	To date	133,229,356	886,696	55	464,233	17,718,644
Not assigned	1966	.....	.....	.....	65,334	6,265,576
	1967	.....	.....	.....	**75,102**	**5,384,621**
	To date	.....	315,498	505,018	627,178	17,251,603
Totals	1966	15,959,293	2,696,011	215,043	1,890,992	21,959,733
	1967	**16,929,451**	**2,822,138**	**51,425**	**2,967,195**	**20,643,673**
	To date	176,472,503	43,927,925	9,131,636	38,912,410	184,910,797

TO DATE, BY MINING DIVISIONS—STRUCTURAL MATERIALS

Brick (Common)	Face, Paving, and Sewer Brick	Fire-bricks, Blocks	Clays	Structural Tile (Hollow Blocks), Roof Tile, Floor Tile	Drain Tile and Sewer Pipe	Pottery (Glazed or Unglazed)	Other Clay Products	Unclassified Material	Division Total
$	$	$	$	$	$	$	$	$	$
									174,161
									417,822
									2,267,649
									6,038
									12,844
									330,891
							5,010		1,619,973
							55,900		**856,015**
1,193	184	4,651	15,807				82,952		10,146,368
									56,498
									515,846
									760,191
									304,305
									335,094
7,800							8,118		6,298,071
									381,964
							27,830		**141,842**
							59,565		2,451,858
									156,704
									207,946
114,361			6,922						1,321,137
									1,040,519
									1,236,825
72,379									13,889,417
									641,364
									520,891
									4,597,221
									143,010
									52,038
									2,539,910
									3,561,079
									3,212,674
1,104,295	38,939		35,758						49,167,615
									427,106
									427,580
19,110	2,864								4,653,071
16,956	994,175	822,670	34,861	59,815	1,003,518	25,568	581,293		8,398,108
2,628	**1,048,938**	**768,351**	**18,668**	**36,247**	**856,238**	**28,029**	**678,005**		**8,819,722**
1,828,019	8,091,904	15,993,680	1,023,978	3,029,149	16,807,021	457,722	3,976,656		112,374,054
									134,219
									124,980
									826,256
									998,139
									1,625,385
5,274									7,807,533
									394,683
									256,324
									2,025,661
									48,083
									492,331
									2,032,784
									279,687
									116,968
							11,992		3,253,932
									592,571
			1,363						**928,616**
							8,324		10,028,873
									86,049
			4,925						**84,101**
									1,342,476
									250,614
									228,604
									2,639,937
									10,193,600
									10,745,614
142,208	241,216	580,778	12,724			23,362	88,304		91,632,989
									271,748
									659,442
131,467	6,202	1,011	5	18,224	4,325		20		4,033,847
							556,326		10,330,132
							424,373		**9,879,862**
1,814,647	29,552	119,930	1,050	705,821	1,072,346	136,504	2,912,735		159,091,569
									6,330,910
									5,459,723
							3,180,828	5,972,171	27,852,296
16,956	994,175	822,670	34,861	59,815	1,003,518	25,568	1,142,629		46,821,264
2,628	**1,048,938**	**768,351**	**18,668**	**36,247**	**856,238**	**28,029**	**1,186,108**		**47,359,089**
5,240,753	8,410,861	16,700,050	1,102,532	3,753,194	17,883,692	617,588	10,329,494	5,972,171	523,365,606

TABLE 8A.—QUANTITY[1] AND VALUE OF COAL PER YEAR TO DATE

Year	Tons (2,000 Lb.)	Value	Year	Tons (2,000 Lb.)	Value
1836–59	41,871	$149,548	1915	2,076,601	$7,114,178
1860	15,956	56,988	1916	2,583,469	8,900,675
1861	15,427	55,096	1917	2,436,101	8,484,343
1862	20,292	72,472	1918	2,575,275	12,833,994
1863	23,906	85,380	1919	2,433,540	11,975,671
1864	32,068	115,528	1920	2,852,535	13,450,169
1865	36,757	131,276	1921	2,670,314	12,836,013
1866	28,129	100,460	1922	2,726,793	12,880,060
1867	34,988	124,956	1923	2,636,740	12,678,548
1868	49,286	176,020	1924	2,027,843	9,911,935
1869	40,098	143,208	1925	2,541,212	12,168,905
1870	33,424	119,372	1926	2,406,094	11,650,180
1871	55,458	164,612	1927	2,553,416	12,269,135
1872	55,458	164,612	1928	2,680,608	12,633,510
1873	55,459	164,612	1929	2,375,060	11,256,260
1874	91,334	244,641	1930	1,994,493	9,435,650
1875	123,362	330,435	1931	1,765,471	7,684,155
1876	155,895	417,576	1932	1,614,629	6,523,644
1877	172,540	462,156	1933	1,377,177	5,375,171
1878	191,348	522,538	1934	1,430,042	5,725,133
1879	270,257	723,903	1935	1,278,380	5,048,864
1880	299,708	802,785	1936	1,352,301	5,722,502
1881	255,760	685,171	1937	1,446,243	6,139,920
1882	315,997	846,417	1938	1,388,507	5,565,069
1883	238,895	639,897	1939	1,561,084	6,280,956
1884	441,358	1,182,210	1940	1,662,027	7,088,265
1885	409,468	1,096,788	1941	1,844,745	7,660,000
1886	365,832	979,908	1942	1,996,000	8,237,172
1887	462,964	1,240,080	1943	1,854,749	7,742,030
1888	548,017	1,467,903	1944	1,931,950	8,217,966
1889	649,411	1,739,490	1945	1,523,021	6,454,360
1890	759,518	2,034,420	1946	1,439,092	6,732,470
1891	1,152,590	3,087,291	1947	1,696,350	8,680,440
1892	925,495	2,479,005	1948	1,604,480	9,765,395
1893	1,095,690	2,934,882	1949	1,621,268	10,549,924
1894	1,134,509	3,038,859	1950	1,574,006	10,119,303
1895	1,052,412	2,824,687	1951	1,573,572	10,169,617
1896	1,002,268	2,693,961	1952	1,402,313	9,729,739
1897	999,372	2,734,522	1953	1,384,138	9,528,279
1898	1,263,272	3,582,595	1954	1,308,284	9,154,544
1899	1,435,314	4,126,803	1955	1,332,874	8,986,501
1900	1,781,000	4,744,530	1956	1,417,209	9,346,518
1901	1,894,544	5,016,398	1957	1,085,657	7,340,339
1902	1,838,621	4,832,257	1958	796,413	5,937,860
1903	1,624,742	4,332,297	1959	690,011	5,472,064
1904	1,887,981	4,953,024	1960	788,658	5,242,223
1905	2,044,931	5,511,861	1961	919,142	6,802,134
1906	2,126,965	5,548,044	1962	825,339	6,133,986
1907	2,485,961	7,637,713	1963	850,541	6,237,997
1908	2,362,514	7,356,866	1964	911,326	6,327,678
1909	2,688,672	8,574,884	1965	950,763	6,713,590
1910	3,314,749	11,108,335	1966	850,821	6,196,219
1911	2,541,698	8,071,747	1967	908,790	7,045,341
1912	3,211,907	10,786,812			
1913	2,713,535	9,197,460	Totals	140,633,492	$602,317,732
1914	2,237,042	7,745,847			

[1] Quantity from 1836 to 1909 is gross mine output and includes material lost in picking and washing. For 1910 and subsequent years the quantity is that sold and used.

TABLE 8B.—COAL PRODUCTION OF BRITISH COLUMBIA, 1967—PRODUCTION AND DISTRIBUTION, BY COLLIERIES AND BY MINING DIVISIONS

Mine	Gross Output	Washery Refuse	Output	Used Under Companies' Boilers, Etc.	Used in Making Coke	Sales					Total Coal Sold and Used	
						Canada		United States	Japan	Total Sales	Amount	Value
						British Columbia	Other Provinces					
Fort Steele Mining Division	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	$
Crows Nest Industries Ltd.—Michel Colliery (underground and strip)	946,224	242,290	703,934	14,290	211,614	70,271	181,790	10,266	407,198	669,525	895,429	6,939,184
Nanaimo Mining Division												
Loudon No. 6 Mine	227	.....	227	.....	.....	227	.....	.....	.....	227	227	3,277
Undun No. 4 Mine	147	.....	147	.....	.....	147	.....	.....	.....	147	147	2,085
Totals	374	.....	374	.....	.....	374	.....	.....	.....	374	374	5,362
Omineca Mining Division												
Bulkley Valley Collieries Ltd. and Luscar Sales Ltd.	12,987	.....	12,987	.....	.....	12,987	.....	.....	.....	12,987	12,987	100,795
Grand totals for Province	959,585	242,290	717,295	14,290	211,614	83,632	181,790	10,266	407,198	682,886	908,790	7,045,341

TABLE 9.—PRINCIPAL ITEMS OF EXPENDITURE, REPORTED FOR OPERATIONS OF ALL CLASSES

Class	Salaries and Wages	Fuel and Electricity	Process Supplies
Metal-mining	$65,294,038	$9,310,948	$29,161,044
Exploration and development	10,886,506	----------	----------
Placer	843	----------	----------
Coal	2,753,653	214,840	526,407
Petroleum and natural gas (exploration and production)	4,250,196	----------	----------
Industrial minerals	4,990,010	1,127,194	1,945,911
Structural-materials industry	6,348,249	2,937,777	2,735,494
Totals, 1967	$94,523,495	$13,590,759	$34,368,856
Totals, 1966	93,409,528	12,283,477	28,120,179
1965	74,938,736	11,504,343	30,590,631
1964	63,624,559	10,205,861	27,629,953
1963	57,939,294	10,546,806	12,923,325
1962	55,522,171	9,505,559	14,024,799
1961	50,887,275	8,907,034	17,787,127
1960	52,694,818	7,834,728	21,496,912
1959	49,961,996	7,677,321	17,371,638
1958	48,933,560	8,080,989	15,053,036
1957	56,409,056	8,937,567	24,257,177
1956	57,266,026	9,762,777	22,036,839
1955	51,890,246	9,144,034	21,131,572
1954	48,702,746	7,128,669	19,654,724
1953	55,543,490	8,668,099	20,979,411
1952	62,256,631	8,557,845	27,024,500
1951	52,607,171	7,283,051	24,724,101
1950	42,738,035	6,775,998	17,500,663
1949	41,023,786	7,206,637	17,884,408
1948	38,813,506	6,139,470	11,532,121
1947	32,160,338	5,319,470	13,068,948
1946	26,190,200	5,427,458	8,367,705
1945	22,620,975	7,239,726	5,756,628
1944	23,131,874	5,788,671	6,138,084
1943	26,051,467	7,432,585	6,572,317
1942	26,913,160	7,066,109	6,863,398
1941	26,050,491	3,776,747	7,260,441
1940	23,391,330	3,474,721	6,962,162
1939	22,357,035	3,266,000	6,714,347
1938	22,765,711	3,396,106	6,544,500
1937	21,349,690	3,066,311	6,845,330
1936	17,887,619	2,724,144	4,434,501
1935	16,753,367	2,619,639	4,552,730

NOTE.—This table has changed somewhat through the years, so that the items are not everywhere directly comparable. Prior to 1962 lode-mining referred only to gold, silver, copper, lead, and zinc. Prior to 1964 some expenditures for fuel and electricity were included with process supplies. Process supplies (except fuel) were broadened in 1964 to include "process, operating, maintenance, and repair supplies . . . used in the mine/mill operations; that is, explosives, chemicals, drill steel, bits, lubricants, electrical, etc. . . . not charged to Fixed Assets Account . . . provisions and supplies sold in any company operated cafeteria or commissary." Exploration and development other than in the field of petroleum and natural gas is given, starting in 1966.

TABLE 10.—AVERAGE NUMBER EMPLOYED IN THE MINERAL INDUSTRY, 1901–67

Year	Lode Metals						Coal Mines			Structural Materials				
	Placer	Mines: Under	Mines: Above	Exploration and Development	Concentrators	Smelters	Total	Under	Above	Total	Quarries and Pits	Plants	Industrial Materials	Petroleum and Natural-gas Exploration and Development	Total
1901	.....	2,736	1,212	.....	.....	.....	3,948	3,041	933	3,974	.....	.....	.....	.....	7,922
1902	.....	2,219	1,126	.....	.....	.....	3,345	3,101	910	4,011	.....	.....	.....	.....	7,356
1903	.....	1,662	1,088	.....	.....	.....	2,750	3,137	1,127	4,264	.....	.....	.....	.....	7,014
1904	.....	2,143	1,163	.....	.....	.....	3,306	3,278	1,175	4,453	.....	.....	.....	.....	7,759
1905	.....	2,470	1,240	.....	.....	.....	3,710	3,127	1,280	4,407	.....	.....	.....	.....	8,117
1906	.....	2,680	1,303	.....	.....	.....	3,983	3,415	1,390	4,805	.....	.....	.....	.....	8,788
1907	.....	2,704	1,239	.....	.....	.....	3,943	2,862	907	3,769	.....	.....	.....	.....	7,712
1908	.....	2,567	1,127	.....	.....	.....	3,694	4,432	1,641	6,073	.....	.....	.....	.....	9,767
1909	.....	2,184	1,070	.....	.....	.....	3,254	4,713	1,705	6,418	.....	.....	.....	.....	9,672
1910	.....	2,472	1,237	.....	.....	.....	3,709	5,903	1,855	7,758	.....	.....	.....	.....	11,467
1911	.....	2,435	1,159	.....	.....	.....	3,594	5,212	1,661	6,873	.....	.....	.....	.....	10,467
1912	.....	2,472	1,364	.....	.....	.....	3,836	5,275	1,855	7,130	.....	.....	.....	.....	10,966
1913	.....	2,773	1,505	.....	.....	.....	4,278	4,950	1,721	6,671	.....	.....	.....	.....	10,949
1914	.....	2,741	1,433	.....	.....	.....	4,174	4,267	1,465	5,732	.....	.....	.....	.....	9,906
1915	.....	2,709	1,435	.....	.....	.....	4,144	3,708	1,283	4,991	.....	.....	.....	.....	9,135
1916	.....	3,357	2,036	.....	.....	.....	5,393	3,694	1,366	5,060	.....	.....	.....	.....	10,453
1917	.....	3,290	2,198	.....	.....	.....	5,488	3,760	1,410	5,170	.....	.....	.....	.....	10,658
1918	.....	2,626	1,764	.....	.....	.....	4,390	3,658	1,769	5,427	.....	.....	.....	.....	9,617
1919	.....	2,513	1,746	.....	.....	.....	4,259	4,145	1,821	5,966	.....	.....	.....	.....	10,225
1920	.....	2,074	1,605	.....	.....	.....	3,679	4,191	2,158	6,349	.....	.....	.....	.....	10,028
1921	.....	1,355	975	.....	.....	.....	2,330	4,722	2,163	6,885	.....	.....	.....	.....	9,215
1922	.....	1,510	1,239	.....	.....	.....	2,749	4,712	1,932	6,644	.....	.....	.....	.....	9,393
1923	.....	2,102	1,516	.....	.....	.....	3,618	4,342	1,807	6,149	.....	.....	.....	.....	9,767
1924	.....	2,353	1,680	.....	.....	.....	4,033	3,894	1,524	5,418	.....	.....	.....	.....	9,451
1925	.....	2,298	2,840	.....	.....	.....	5,138	3,828	1,615	5,443	.....	.....	.....	.....	10,581
1926	299	2,606	1,735	.....	808	2,461	7,610	3,757	1,565	5,322	493	324	124	.....	14,172
1927	415	2,671	1,916	.....	854	2,842	8,283	3,646	1,579	5,225	647	138	122	.....	14,830
1928	355	2,707	2,469	.....	911	2,748	8,835	3,814	1,520	5,334	412	368	120	.....	15,424
1929	341	2,926	2,052	.....	966	2,948	8,892	3,675	1,353	5,028	492	544	268	.....	15,565
1930	425	2,316	1,260	.....	832	3,197	7,605	3,389	1,256	4,645	843	344	170	.....	14,032
1931	688	1,463	834	.....	581	3,157	6,035	2,957	1,125	4,082	460	526	380	.....	12,171
1932	874	1,355	900	.....	542	2,036	4,833	2,628	980	3,608	536	329	344	.....	10,524
1933	1,134	1,786	1,335	.....	531	2,436	6,088	2,241	853	3,094	376	269	408	.....	11,369
1934	1,122	2,796	1,729	.....	631	2,890	8,046	2,050	843	2,893	377	187	360	.....	12,985
1935	1,291	2,740	1,497	.....	907	2,771	7,915	2,145	826	2,971	536	270	754	.....	13,737
1936	1,124	2,959	1,840	.....	720	2,678	8,197	2,015	799	2,814	931	288	825	.....	14,179
1937	1,371	3,603	1,818	.....	1,168	3,027	9,616	2,286	867	3,153	724	327	938	.....	16,129
1938	1,303	3,849	2,266	.....	919	3,158	10,192	2,088	874	2,962	900	295	369	.....	16,021
1939	1,252	3,905	2,050	.....	996	3,187	10,138	2,167	809	2,976	652	311	561	.....	15,890
1940	1,004	3,923	2,104	.....	1,048	2,944	10,019	2,175	699	2,874	827	334	647	.....	15,705
1941	939	3,901	1,823	.....	1,025	3,072	9,821	2,229	494	2,723	766	413	422	.....	15,084
1942	489	2,920	1,504	.....	960	3,555	8,939	1,892	468	2,360	842	378	262	.....	13,270
1943	212	2,394	1,699	.....	891	2,835	7,819	2,240	611	2,851	673	326	567	.....	12,448
1944	255	1,896	1,825	.....	849	2,981	7,551	2,150	689	2,839	690	351	628	.....	12,314
1945	209	1,933	1,750	.....	822	2,834	7,339	1,927	503	2,430	921	335	586	.....	11,820
1946	347	1,918	1,817	.....	672	2,813	7,220	1,773	532	2,305	827	555	679	.....	11,933
1947	360	3,024	2,238	.....	960	3,461	9,683	1,694	731	2,425	977	585	869	.....	14,899
1948	348	3,143	2,429	.....	1,126	3,884	10,582	1,594	872	2,466	1,591	656	754	.....	16,397
1949	303	3,034	2,724	.....	1,203	3,763	10,724	1,761	545	2,306	2,120	542	626	.....	16,621
1950	327	3,399	2,415	.....	1,259	3,759	10,832	1,745	516	2,261	1,916	616	660	.....	16,612
1951	205	3,785	3,695	.....	1,307	4,044	12,831	1,462	463	1,925	1,783	628	491	.....	17,863
1952	230	4,171	3,923	.....	1,516	4,120	13,730	1,280	401	1,681	1,530	557	529	.....	18,257
1953	132	3,145	2,589	.....	1,371	3,901	11,006	1,154	396	1,550	1,909	559	634	.....	15,790
1954	199	2,644	2,520	.....	1,129	3,119	9,412	1,076	358	1,434	1,861	638	584	.....	14,128
1955	103	2,564	2,553	.....	1,091	3,304	9,512	1,100	378	1,478	1,646	641	722	.....	14,102
1956	105	2,637	2,827	.....	1,043	3,339	9,846	968	398	1,366	1,598	770	854	.....	14,539
1957	67	2,393	2,447	.....	838	3,328	9,006	1,020	360	1,380	1,705	625	474	.....	13,257
1958	75	1,919	1,809	.....	625	3,081	7,434	826	260	1,086	1,483	677	446	.....	11,201
1959	99	1,937	1,761	.....	618	3,008	7,324	765	291	1,056	1,357	484	459	.....	10,779
1960	86	1,782	1,959	.....	648	3,034	7,423	894	288	1,182	1,704	557	589	.....	11,541
1961	74	1,785	1,582	.....	626	3,118	7,111	705	237	942	1,828	508	571	.....	11,034
1962	35	1,677	1,976	270	949	3,356	8,228	548	228	776	1,523	481	517	.....	11,560
1963	43	1,713	2,012	450	850	3,239	8,264	501	247	748	909	460	528	.....	10,952
1964	5	1,839	1,967	772	822	3,281	8,681	446	267	713	1,293	444	509	.....	11,645
1965	2	1,752	2,019	786	965	3,529	9,051	405	244	649	1,079	422	639	441	12,283
1966	2	2,006	2,296	1,894	1,014	3,654	10,864	347	267	614	1,269	393	582	478	14,202
1967	.....	**1,928**	**2,532**	**1,264**	**992**	**3,435**	**10,151**	**260**	**1197**	**457**	**1,309**	**372**	**584**	**507**	**13,380**

[1] Commencing with 1967, does not include employment in by-product plants.

NOTE.—These figures refer only to company employees and do not include the many employees of contracting firms.

TABLE 11A.—EMPLOYMENT AT METAL MINES, 1967

	Tons		Days Operating Mill	Average Number Employed[1]					
					Mine				
	Mined	Milled		Administrative, Etc.	Surface	Underground	Mill	Others	Total
Aetna Investment Corporation Ltd. (Mineral King)	111,332	111,332	365	4	.....	51	9	20	84
The Anaconda Co. (Canada) Ltd. (Britannia)	628,346	627,868	260	89	70	260	39	.....	458
Bethlehem Copper Corporation Ltd. (including Floods Mining and Aggregate Co.) (Bethlehem)	4,331,777	3,948,134	365	30	171	.....	78	.....	279
Bralorne Pioneer Mines Ltd. (Bralorne)	103,706	97,332	195	31	30	105	12	.....	178
British Columbia Molybdenum Ltd. (Alice)	88,719	88,719	20	8	5	.....	4	4	21
Brynnor Mines Ltd. (Boss Mountain)	469,444	469,444	365	41	76	66	26	.....	209
Brynnor Mines Ltd. (Kennedy Lake)	326,283	187,588	65	21	41	.....	6	.....	68
Canadian Exploration Ltd. (Jersey)	490,312	493,029	365	58	29	122	14	.....	223
Cariboo Gold Quartz Mining Co. Ltd. (Aurum)	6,821	6,821	105	.....	.....	.....	.....	.....	(2)
Coast Copper Co. Ltd. (Old Sport)	290,524	290,524	365	33	38	124	10	.....	205
Cominco Ltd. (Bluebell)	255,536	255,536	351	37	31	148	15	2	233
Cominco Ltd. (Sullivan)	2,118,377	2,456,037	252	216	(3)	467[3]	127	.....	810
Cowichan Copper Co. Ltd. (Sunloch, Gabbro)	151,978	151,978	240	18	6	53	22	.....	99
Craigmont Mines Ltd. (Craigmont)	1,199,123	1,934,810	364	104	29	145	183	.....	461
Empire Development Co. Ltd. (Merry Widow, Kingfisher)	175,078	175,078	186	6	10	12	3	.....	31
Endako Mines Ltd. (Endako)	11,069,988	6,778,000	365	113	263	.....	87	.....	463
Giant Mascot Mines Ltd. (Pride of Emory)	338,912	338,912	253	31	.....	96	21	27	175
Giant Soo Mines Ltd. (Estella)	40,250	40,250	278	3	2	24	8	3	40
Granby Mining Co. Ltd. (Phoenix)	800,350	713,513	365	21	60	.....	34	40	155
Granisle Copper Ltd. (Granisle)	2,379,062	1,979,176	365	29	27	.....	40	33	129
Jedway Iron Ore Ltd. (Jessie, Adonis, Rose)	871,348	928,412	365	26	86	10	18	.....	140
Mastodon-Highland Bell Mines Ltd. (Highland-Bell)	38,048	34,020	310	9	4	30	13	.....	56
Minoca Mines Ltd. (Yreka)	73,247	73,279	271	13	6	11	7	.....	37
Mt. Washington Milling Co. Ltd. (Mt. Washington)	.....	29,121	.....	.....	.....	.....	.....	.....	(4)
Red Mountain Mines Ltd. (Coxey)	160,517	159,711	326	11	4	.....	24	.....	39
Reeves MacDonald Mines Ltd. (Reeves MacDonald)	404,782	404,782	353	22	28	80	18	.....	148
Silbak Premier Mines Ltd. (Silbak Premier)	6,694	6,694	194	.....	2	2	5	1	10
Texada Mines Ltd. (Texada)	1,308,000	1,380,000	365	48	73	114	37	.....	272
Utica Mines Ltd. (Horn Silver)	38,442	38,442	131	.....	21	29	7	.....	57
Wesfrob Mines Ltd. (Tasu)	984,003	984,003	253	47	48	.....	66	.....	161
Western Mines Ltd. (Lynx)	310,604	310,604	363	12	52	37	23	.....	124
Zeballos Iron Mines Ltd. (F.L.)	338,779	372,198	272	16	2	35	3	31	87
Total number employed	.....	.....	.....	.....	.....	.....	.....	.....	5,452

[1] The average number employed includes wage-earners and salaried employees. The average is obtained by adding the monthly figures and dividing by 12, irrespective of the number of months worked.

[2] Mine closed April 15, 1967. Statistics estimated as records not available.

[3] No breakdown between number of surface and underground employees.

[4] Company in receivership, records not available. Quantity milled obtained from monthly reports.

TABLE 11B.—EMPLOYMENT AT COLLIERIES, 1967

Colliery	Average Number Employed[1]		
	Underground	Above	Total
Bulkley Valley Collieries Ltd. and Luscar Sales Ltd.	-----	9	9
Crows Nest Industries Ltd.—Michel Colliery	258	188	446
Loudon No. 6	1	-----	1
Undun No. 4	1	-----	1
Totals	260	197	457

[1] The average number employed includes wage-earners and salaried employees. The average is obtained by adding the monthly figures and dividing by 12, irrespective of the number of months worked.

TABLE 12.—METAL PRODUCTION IN 1967

Property or Mine	Location of Mine	See Page	Owner or Agent	Ore Shipped or Treated	Product Shipped	Gross Metal Contents					
						Gold	Silver	Copper	Lead	Zinc	Cadmium
Alberni Mining Division				Tons		Oz.	Oz.	Lb.	Lb.	Lb.	Lb.
Brynnor Mine	Kennedy Lake	75	Brynnor Mines Ltd., Kennedy Lake Division	187,588	Iron concentrates, 137,229 tons						
F.L.	Zeballos	73	Zeballos Iron Mines Ltd.	372,198	Iron concentrates, 245,806 tons						
Lynx Mine	Buttle Lake	77	Western Mines Ltd.	310,604	Copper concentrates, 18,683 tons; zinc concentrates, 23,563 tons; lead-zinc concentrates, 1,815 tons	10,902	410,301	8,967,376	3,937,898	32,032,048	119,789
Atlin Mining Division											
Nil											
Cariboo Mining Division											
Aurum	Wells	121	The Cariboo Gold Quartz Mining Co. Ltd.	6,821	Bullion	5,481	960				
Boss Mountain Mine	Big Timothy Mountain	125	Brynnor Mines Ltd., Boss Mountain Division	469,444	Molybdenite concentrates, 2,705 tons containing 3,106,460 lb. of molybdenum						
Clinton Mining Division											
Nil											
Fort Steele Mining Division											
Estella Mine	Wasa	272	Giant Soo Mines Ltd.	40,250	Lead concentrates, 2,489 tons; zinc concentrates, 5,316 tons	28	73,079	2,641	3,350,330	5,705,358	15,985
Sullivan Mine	Kimberley	270	Cominco Ltd.	2,456,037	Lead concentrates, 113,317 tons; zinc concentrates, 126,053 tons; tin concentrates, 251 tons containing 437,804 lb. of tin; iron sinter, 172,413 tons	134	3,062,720	291,200	164,766,000	133,838,000	255,297
Golden Mining Division											
Mineral King Mine	Windermere	267	Aetna Investment Corporation Ltd.	111,332	Lead concentrates, 2,831 tons; zinc concentrates, 6,894 tons		52,312	48,971	3,599,541	7,658,086	31,985
Greenwood Mining Division											
Barnato	Kettle River	225	Amcana Gold Mine Ltd.	21	Crude ore	7					
Highland-Bell Mine	Beaverdell	223	Mastodon-Highland Bell Mines Ltd.	34,020	Lead concentrates, 3,153 tons; zinc concentrates, 494 tons; jig concentrates, 247 tons	780	713,911		1,003,546	930,431	4,778
Marshall	Phoenix	228	P. Gouthro and J. W. MacLean, Jr., Greenwood	97	Crude ore	107	68		359	371	
Phoenix Mine	Phoenix	227	The Granby Mining Co. Ltd., Phoenix Copper Division	713,513	Copper concentrates, 19,170 tons	13,892	113,096	10,156,659			

				Tons		Oz.	Oz.	Lb.	Lb.	Lb.	Lb.
Kamloops Mining Division											
Bethlehem Mine	Highland Valley	153	Bethlehem Copper Corporation Ltd.	3,948,134	Copper concentrates, 62,383 tons	1,627	153,222	40,123,750			
Liard Mining Division											
Nil											
Lillooet Mining Division											
Bralorne Mine	Bridge River	129	Bralorne Pioneer Mines Ltd.	97,332	Bullion	48,711	8,652				
Eagle	Yalakom River		Lillooet Mercury Mines Ltd.	125	Mercury, 380 lb.						
Nanaimo Mining Division											
Copper Road	Quadra Island	72	Ribco Leasing Ltd.	563	Crude ore	5	304	36,450			
Mount Washington Mine	Courtenay	72	Mount Washington Milling Co. Ltd.	10,665	Copper concentrates, 1,568 tons	418	16,121	567,732			
Merry Widow and Kingfisher	Quatsino-Port Hardy	70	Empire Development Co. Ltd.	175,078	Iron concentrates, 90,407 tons						
Old Sport	Quatsino-Port Hardy	71	Coast Copper Co. Ltd.	290,524	Copper concentrates, 11,626 tons; iron concentrates, 102,-226 tons	15,322	37,115	7,654,858			
Texada Mine	Texada Island	72	Texada Mines Ltd.	1,380,000	Iron concentrates, 762,102 tons; copper concentrates, 6,088 tons	1,228	33,154	2,656,434			
Yreka	Quatsino-Port Hardy	70	Minoca Mines Ltd.	73,279	Copper concentrates, 8,037 tons	641	57,947	3,540,636			
Nelson Mining Division											
Gold Belt	Salmo, Sheep Creek	245	A. Endersby, Fruitvale	100	Crude ore	43	16		200	315	
Jersey	Salmo, Iron Mountain	245	Canadian Exploration Ltd.	493,029	Lead concentrates, 5,724 tons; zinc concentrates, 15,121 tons		35,275		9,002,461	18,013,821	149,582
Kootenay Belle	Salmo	245	W. D. Tames, Nelson	281	Crude ore	10	42		698	562	
New Arlington	Salmo, Erie Creek	244	G. D. Fox, Trail	7,325	Crude ore	851	3,241		61,605	79,813	
Reeves MacDonald Mine	Nelway	247	Reeves MacDonald Mines Ltd.	404,782	Lead concentrates, 4,997 tons; zinc concentrates, 20,924 tons		65,253	19,668	5,535,662	22,917,119	159,460
Silver Dollar	Salmo, Erie Creek	244	D. H. Norcross, Nelson	446	Crude ore	215	9,920		15,856	16,152	
Yosemite	Salmo	245	W. D. Tames, Nelson	3,160	Crude ore	259	401		7,158	6,318	
New Westminster Mining Division											
Pride of Emory	Hope	63	Giant Mascot Mines Ltd.	338,912	Nickel-copper concentrates, 22,-777 tons; nickel content, 4,750,957 lb.			1,974,527			

TABLE 12.—METAL PRODUCTION IN 1967—*Continued*

Property or Mine	Location of Mine	See Page	Owner or Agent	Ore Shipped or Treated	Product Shipped	Gross Metal Contents					
						Gold	Silver	Copper	Lead	Zinc	Cadmium
				Tons		Oz.	Oz.	Lb.	Lb.	Lb.	Lb.
Nicola Mining Division											
Craigmont Mine	Merritt	163	Craigmont Mines Ltd.	1,934,810	Copper concentrates, 106,634 tons			59,798,408			
Law, Len	Merritt	166	Copper Hill Mining & Exploration Ltd.	73	Crude ore	6	681		2,041		
Mary Reynolds	Stump Lake		D. Faulkner, Merritt	19	Crude ore	1	191		383	307	
Omineca Mining Division											
Cronin Mine	Smithers	89	New Cronin Babine Mines Ltd.	750	Lead concentrates, 56 tons; zinc concentrates, 84 tons	6	4,675		74,064	104,770	1,091
Emerald Glacier Mine	Tahtsa Lake	110	Emerald Glacier Mines Ltd.	2,001	Lead concentrates, 129 tons; zinc concentrates, 356 tons	7	9,604	4,930	201,567	348,992	1,393
Endako Mine	Endako	114	Endako Mines Ltd.	6,773,000	Molybdenite concentrates, 7,770 tons; molybdenum trioxide, 4,820 tons. Total content, 13,716,016 lb. of molybdenum						
Granisle Mine	Babine Lake	104	Granisle Copper Ltd.	1,979,176	Copper concentrates, 36,064 tons	15,820	157,403	23,953,000			
Lucky Luke	Usk		Lucky Luke Mining Co. Ltd.	3	Crude ore	3	108	2,552			
Silver Standard	Hazelton	84	Northwestern Midland Development Co. Ltd.	402	Lead concentrates, 37 tons; lead ore, 117 tons; crude ore, 80 tons	32	16,415		36,903	30,855	
Osoyoos Mining Division											
Horn Silver Mine	Keremeos	219	Utica Mines Ltd.	38,442	Silver concentrates, 1,254 tons	892	422,158		79,218	95,074	
Revelstoke Mining Division											
Stannite	Albert Canyon	263	Stannex Minerals Ltd.	36	Crude ore		1,248		31,524	6,205	
Similkameen Mining Division											
Nil											
Skeena Mining Division											
Alice	Alice Arm	47	British Columbia Molybdenum Ltd.	88,719	Molybdenite concentrates, 15 tons containing 16,249 lb. of molybdenum						
Jessie, Adonis, Rose	Moresby Island	57	Jedway Iron Ore Ltd.	928,412	Iron concentrates, 417,852 tons						
Silbak Premier Mine	Stewart	34	Silbak Premier Mines Ltd.	6,694	Gold-silver concentrates and precipitates, 276 tons	3,589	82,898		47,415	61,123	

				Tons		Oz.	Oz.	Lb.	Lb.	Lb.	Lb.
Tasu	Tasu Harbour	54	Wesfrob Mines Ltd.	984,003	Iron concentrates, 226,408 tons; copper concentrates, 3,099 tons	752	19,360	1,223,857			
Slocan Mining Division											
Antoine	Sandon	253	Antoine Silver Mines Ltd.	25	Crude ore		4,254		28,891	6,235	
Bluebell Mine	Riondel	259	Cominco Ltd.	255,536	Lead concentrates, 15,409 tons; zinc concentrates, 27,957 tons		314,760	377,000	22,196,400	28,341,600	131,876
Caledonia	Retallack-Three Forks	254	Blue Star Mines Ltd.	3,800	Lead concentrates, 151 tons; zinc concentrates, 239 tons	11	15,012		258,826	260,432	975
Colorado	Slocan	250	Western Standard Silver Mines Ltd.	23	Crude ore		279		231	646	
Dublin Queen	Kaslo	254	P. Kabatoff, Winlaw	32	Crude ore		2,166		22,915	14,847	
Freddy	Silverton	252	V. Hansen, New Denver	30	Crude ore	3	1,013		303	243	
Hewitt, Lorna Doone	Silverton	251	A. K. Lotze, Colville, Wash.	5	Crude ore		136		730	484	
Joyce	Silverton	249	J. Nesbitt, Silverton	10	Crude ore	2	305		39	20	
Meteor	Slocan	249	C. Thickett and J. C. McWhirter, Slocan	116	Crude ore	11	1,999		372	372	
Ottawa	Springer Creek	250	Brimont Mining Ltd.	1,612	Crude ore		24,256				
R.F.G.	Ainsworth	256	E. Savage, Nakusp	19	Crude ore		173		3,893	944	
Silver Hoard	Ainsworth	256	S. L. McLellan, Ainsworth	14	Crude ore		302		873	1,914	
Victor	Sandon	252	E. H. Peterson and E. Perepolkin	52	Crude ore	11	5,238		67,801	2,225	
Wetwater	Woodbury Creek		W. Turley, Nelson	2	Crude ore		12		712	125	
Winona	Retallack-Three Forks	254	Hilroy Mines Ltd.	2	Crude ore		142		1,951	650	
Trail Creek Mining Division											
Coxey	Rossland	239	Red Mountain Mines Ltd.	159,711	Molybdenite concentrates, 656 tons containing 678,818 lb. of molybdenum						
I.X.L.	Rossland	235	J. A. Ruelle, Rossland	.08	High-grade ore	13	2				
Vancouver Mining Division											
Britannia Mine	Howe Sound	61	The Anaconda Co. (Canada) Ltd.	627,868	Copper concentrates, 21,335 tons; zinc concentrates, 757 tons	3,128	45,733	12,672,879	17,328	810,549	4,522
Vernon Mining Division											
Waterloo No. 3	Lightning Peak	223	D. Pearce, Nelson	Clean-up	Lead concentrates, 2 tons; zinc concentrates, 42 tons		1,914		4,929	49,375	271
Victoria Mining Division											
Sunloch, Gabbro	Jordan River	78	Cowichan Copper Co. Ltd.	151,978	Copper concentrates, 5,876 tons	460	3,290	3,000,000			

Departmental Work

RETIREMENTS

Robert B. Bonar retired as Deputy Chief Inspector of Mines on July 31, 1967. Mr. Bonar was born in Glasgow, Scotland, and immigrated to Canada in 1910. He received his early education on Vancouver Island and later attended the Tri-State College of Engineering in Indiana, where he graduated with a degree of B.Sc. in civil engineering. He holds a first-class certificate of competency and a mine surveyor's certificate in coal-mining. He joined the Department as Inspector and Resident Engineer at Cumberland in June, 1941, after some years as mine foreman at Michel Colliery, Michel, and mine manager at Canadian Collieries (Dunsmuir), Cumberland. He served as Inspector and Resident Engineer at Fernie before moving to the headquarters office in Victoria in 1956. He is a member of the Association of Professional Enginers of British Columbia and the Canadian Institute of Mining and Metallurgy.

E. R. Hughes retired as Senior Inspector of Mines on August 31, 1967. Mr. Hughes was born in Wales and educated in Yorkshire, England. After employment in Yorkshire Collieries he came to Canada in 1928, where he worked in coal mines in Saskatchewan, Alberta, and at Telkwa, Cumberland, and Nanaimo in British Columbia and at the Hidden Creek copper mine at Anyox. He was appointed Inspector of Mines and Resident Engineer at Cumberland in 1938. He was transferred to Princeton in 1941 and was moved to the Victoria office in 1956 as Senior Inspector in charge of administering the Department's road and trail programme and the grubstaking of prospectors. He holds a first-class certificate of competency in coal-mining and is a member of the Canadian Institute of Mining and Metallurgy and the Association of Professional Engineers of British Columbia. He served with the R.A.S.C. in the Army of Occupation in Turkey after the First World War.

ORGANIZATION

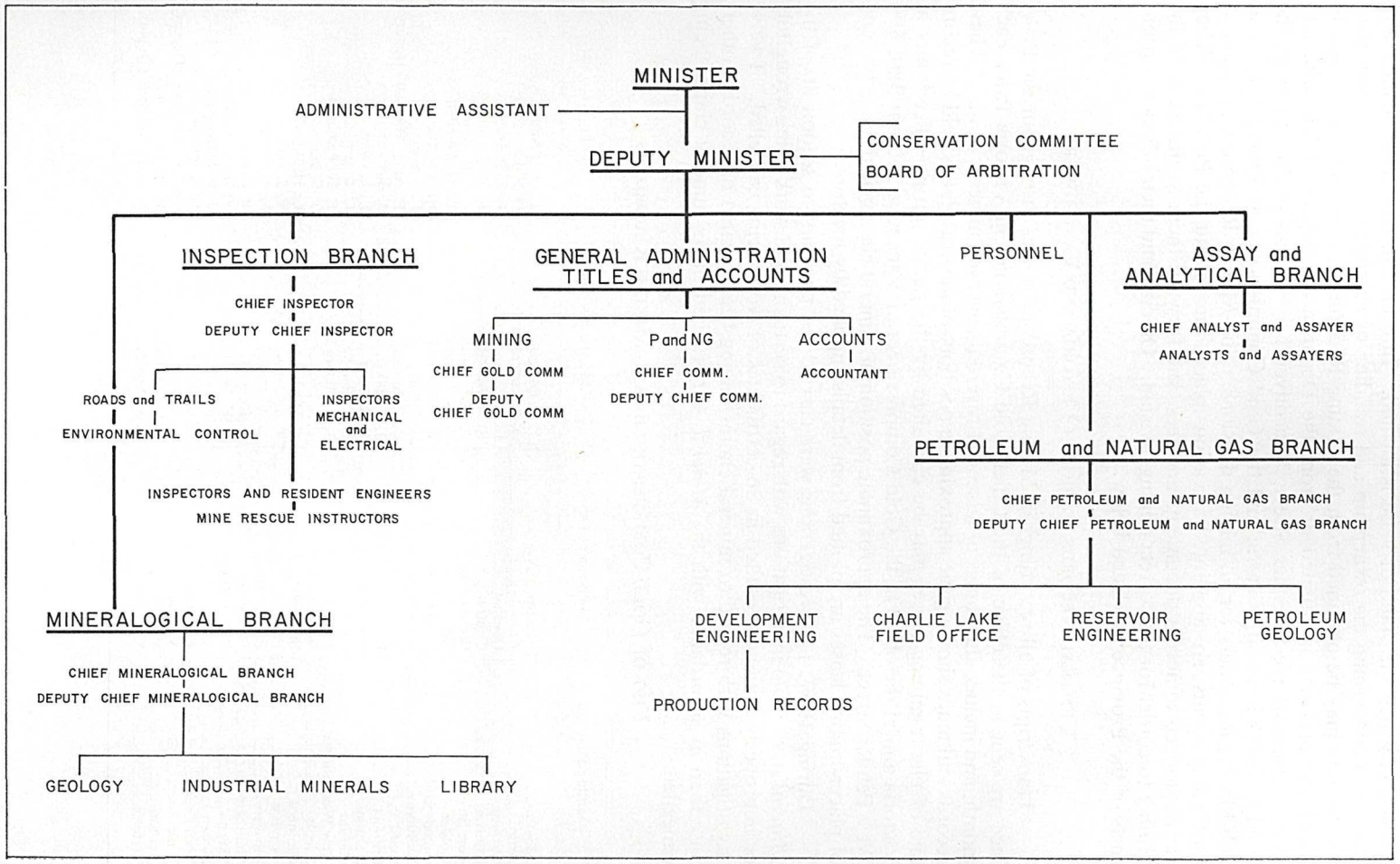
The organization of the Department of Mines and Petroleum Resources is displayed in the diagram on page A 57.

ADMINISTRATION BRANCH

The Administration Branch is responsible for the administration of the Provincial laws regarding the acquisition of rights to mineral and coal, petroleum, and natural gas, and deals with other departments of the Provincial service for the Department or for any branch.

Gold Commissioners, Mining Recorders, and Sub-Mining Recorders, whose duties are laid down in the *Mineral Act* and *Placer-mining Act,* administer these Acts and other Acts relating to mining. Mining Recorders, in addition to their own functions, may also exercise the powers conferred upon Gold Commissioners with regard to mineral claims within the mining division for which they have been appointed. Similar duties may be performed by Mining Recorders with regard to placer claims but not in respect of placer-mining leases.

Recording of location and of work upon a mineral claim as required by the *Mineral Act* and upon a placer claim or a placer-mining lease as required by the *Placer-mining Act* must be made at the office of the Mining Recorder for the mining


MINISTER
ADMINISTRATIVE ASSISTANT
DEPUTY MINISTER
CONSERVATION COMMITTEE
BOARD OF ARBITRATION
INSPECTION BRANCH
CHIEF INSPECTOR
DEPUTY CHIEF INSPECTOR
ROADS and TRAILS
ENVIRONMENTAL CONTROL
INSPECTORS MECHANICAL and ELECTRICAL
INSPECTORS AND RESIDENT ENGINEERS
MINE RESCUE INSTRUCTORS
GENERAL ADMINISTRATION TITLES and ACCOUNTS
MINING
CHIEF GOLD COMM
DEPUTY CHIEF GOLD COMM
P and NG
CHIEF COMM.
DEPUTY CHIEF COMM.
ACCOUNTS
ACCOUNTANT
PERSONNEL
ASSAY and ANALYTICAL BRANCH
CHIEF ANALYST and ASSAYER
ANALYSTS and ASSAYERS
PETROLEUM and NATURAL GAS BRANCH
CHIEF PETROLEUM and NATURAL GAS BRANCH
DEPUTY CHIEF PETROLEUM and NATURAL GAS BRANCH
DEVELOPMENT ENGINEERING
PRODUCTION RECORDS
CHARLIE LAKE FIELD OFFICE
RESERVOIR ENGINEERING
PETROLEUM GEOLOGY
MINERALOGICAL BRANCH
CHIEF MINERALOGICAL BRANCH
DEPUTY CHIEF MINERALOGICAL BRANCH
GEOLOGY
INDUSTRIAL MINERALS
LIBRARY

division in which the claim or lease is located. Information concerning claims and leases and concerning the ownership and standing of claims and leases in any mining division may be obtained from the Mining Recorder for the mining division in which the property is situated or from the Department's offices at Victoria, and Room 320, 890 West Pender Street, Vancouver 1. Officials in the offices of the Gold Commissioner at Victoria and the Gold Commissioner at Vancouver act as Sub-Mining Recorders for all mining divisions. Sub-Mining Recorders, who act as forwarding agents, are appointed at various places throughout the Province. They are authorized to accept documents and fees, and forward them to the office of the Mining Recorder for the correct mining division. Officials and their offices in various parts of the Province are listed below.

Central Records Offices (Victoria and Vancouver)

Transcripts of all recordings in Mining Recorders' offices throughout the Province are sent to the office of the Chief Gold Commissioner in Victoria twice each month, and include the names of lessees of reverted surveyed mineral claims. These records and maps showing the approximate positions of mineral claims held by record and of placer-mining leases may be consulted by the public during office hours at Victoria and at the office of the Gold Commissioner at Vancouver, Room 320, 890 West Pender Street. The approximate position of mineral claims held by record and of placer-mining leases are plotted from details supplied by locators.

During 1967, 14 investigations were carried out pursuant to section 80 of the *Mineral Act*. Two investigations with regard to certificates of work being wrongfully or improperly obtained resulted in 36 certificates of work being cancelled. Twelve investigations with regard to mineral claims having been located or recorded otherwise than in accordance with the *Mineral Act* resulted in 99 mineral claims being cancelled.

List of Gold Commissioners and Mining Recorders

Mining Division	Location of Office	Gold Commissioner	Mining Recorder
Alberni	Alberni	T. G. O'Neill	T. G. O'Neill.
Atlin	Atlin	D. P. Lancaster	D. P. Lancaster.
Cariboo	Quesnel	F. E. P. Hughes	F. E. P. Hughes.
Clinton	Clinton	R. H. Archibald	R. H. Archibald.
Fort Steele	Cranbrook	B. J. H. Ryley	B. J. H. Ryley.
Golden	Golden	W. G. Mundell	W. G. Mundell.
Greenwood	Grand Forks	R. Macgregor	R. Macgregor.
Kamloops	Kamloops	F. J. Sell	F. J. Sell.
Liard	Victoria	E. J. Bowles	E. A. H. Mitchell (Deputy).
Lillooet	Lillooet	J. A. Baker	J. A. Baker.
Nanaimo	Nanaimo	E. B. Offin	E. B. Offin.
Nelson	Nelson	G. L. Brodie	G. L. Brodie.
New Westminster	New Westminster	J. F. McDonald	E. W. Pedersen.
Nicola	Merritt	T. S. Dobson	T. S. Dobson.
Omineca	Smithers	G. H. Beley	G. H. Beley.
Osoyoos	Penticton	T. S. Dalby	T. S. Dalby.
Revelstoke	Revelstoke	D. V. Drew	D. V. Drew.
Similkameen	Princeton	B. Kennelly	B. Kennelly.
Skeena	Prince Rupert	T. H. W. Harding	T. H. W. Harding.
Slocan	Kaslo	T. P. McKinnon	T. P. McKinnon.
Trail Creek	Rossland	W. L. Draper	W. L. Draper.
Vancouver	Vancouver	J. Egdell	Mrs. S. Jeannotte (Deputy).
Vernon	Vernon	W. T. McGruder	W. T. McGruder.
Victoria	Victoria	E. J. Bowles	E. A. H. Mitchell (Deputy).

Gold Commissioners' and Mining Recorders' Office Statistics, 1967

Mining Division	Free Miners' Certificates		Lode-mining						Placer-mining					Revenue		
	Individual	Company	Mineral Claims	Certificates of Work	Cash in Lieu	Certificates of Improvements	Bills of Sale, Etc.	Leases	Placer Claims	Leases	Certificates of Work	Cash in Lieu	Bills of Sale, Etc.	Free Miners' Certificates	Mining Receipts	Total
Alberni	106	2	709	1,055	$6,400.00	.....	54	2	1	12	.....	$250.00	12	$830.00	$21,380.00	$22,210.00
Atlin	163	4	752	286	8,900.00	.....	27	1	1	19	32	7,025.00	12	1,315.00	11,826.00	13,141.00
Cariboo	1,223	10	4,087	3,533	6,900.00	.....	193	2	7	108	255	3,750.00	193	7,779.00	72,211.75	79,990.75
Clinton	79	.....	1,840	2,076	1,200.00	.....	70	1	.....	25	37	.....	61	395.00	23,841.75	24,236.75
Fort Steele	122	4	1,187	2,126	4,912.00	.....	77	5	.....	8	22	750.00	15	1,110.00	23,781.00	24,891.00
Golden	67	5	1,482	1,421	2,400.00	.....	112	2	.....	17	22	.....	39	835.00	22,485.25	23,320.25
Greenwood	147	6	1,815	2,513	3,516.00	.....	132	39	.....	3	13	.....	1	1,835.00	34,909.50	36,744.50
Kamloops	237	10	5,046	8,410	9,800.00	.....	350	3	.....	5	19	.....	10	2,785.00	89,426.25	92,211.25
Liard	304	3	3,222	5,244	31,202.50	.....	238	.....	.....	14	39	250.00	27	2,022.00	80,501.50	82,523.50
Lillooet	179	2	591	1,737	2,800.00	.....	60	3	.....	15	43	250.00	16	1,196.00	18,641.50	19,837.50
Nanaimo	147	2	3,068	989	3,336.00	.....	104	.....	.....	.....	.....	.....	.....	1,135.00	21,848.00	22,983.00
Nelson	387	10	962	787	800.00	.....	83	24	.....	1	24	250.00	12	3,536.00	15,798.50	19,334.50
New Westminster	409	10	1,593	3,019	8,200.00	.....	130	5	4	87	18	750.00	7	4,414.00	40,737.00	45,151.00
Nicola	118	9	2,773	4,906	6,000.00	.....	278	4	.....	.....	2	.....	.....	2,390.00	52,210.00	54,600.00
Omineca	542	8	9,799	12,530	28,700.00	98	459	15	.....	12	68	1,250.00	44	4,011.00	167,739.25	171,750.25
Osoyoos	261	11	2,976	3,612	8,100.00	.....	209	10	.....	.....	.....	.....	.....	3,207.00	51,156.50	54,363.50
Revelstoke	85	6	1,363	982	3,400.00	.....	25	1	.....	.....	16	.....	.....	1,625.00	20,555.25	22,180.25
Similkameen	259	7	2,315	3,677	6,500.00	.....	167	2	.....	69	170	5,750.00	159	2,497.00	59,857.75	62,354.75
Skeena	148	1	1,922	5,521	20,816.00	.....	158	54	.....	7	.....	.....	.....	840.00	29,725.99	30,565.99
Slocan	186	6	924	1,937	4,444.00	.....	177	46	.....	.....	3	.....	4	1,945.00	25,136.00	27,081.00
Trail Creek	113	4	402	285	236.00	.....	21	9	.....	.....	.....	.....	.....	1,365.00	7,056.75	8,421.75
Vancouver	2,831	536	1,428	1,412	7,500.00	.....	85	7	.....	2	1	.....	6	114,510.00	35,270.09	149,780.09
Vernon	294	3	680	591	100.00	.....	64	6	1	10	25	.....	11	1,871.00	9,740.50	11,611.50
Victoria	373	58	342	261	800.00	.....	45	3	.....	6	4	.....	1	12,468.00	5,602.00	18,070.00
Totals for 1967	8,780	717	51,278	68,910	$176,962.50	98	3,318	244	14	420	813	$20,275.00	630	$175,916.00	$941,438.08	$1,117,354.08
Totals for 1966	10,086	746	91,703	56,138	$175,732.00	77	3,776	275	12	428	758	$12,600.00	586	$186,636.00	$1,173,244.30	$1,359,880.30

Coal

Information concerning the ownership and standing of coal licences and coal leases may be obtained upon application to the office of the Chief Gold Commissioner, Department of Mines and Petroleum Resources, Victoria. Maps showing location of coal licences and coal leases are also available upon application and payment of the required fee.

Coal Revenue, 1967

Licences—	
Fees	$7,650.00
Rental	15,868.45
Total	$23,518.45

Petroleum and Natural Gas

The Administration Branch is responsible for the administration of the *Petroleum and Natural Gas Act* and the collecting of revenue from fees, rents, dispositions, and royalties. Information concerning all forms of title issued under the *Petroleum and Natural Gas Act* may be obtained upon application to the office of the Chief Commissioner, Department of Mines and Petroleum Resources, Victoria. Maps showing the locations of all forms of title issued under the *Petroleum and Natural Gas Act* are available, and copies may be obtained upon application to the office of the Department of Mines and Petroleum Resources, Victoria. Monthly land reports and monthly reports listing additions and revisions to permit-location maps and listing changes in title to permits, licences, and leases, and related matters are available from the office of the Chief Commissioner upon application and payment of the required fee.

During the year there were four dispositions of Crown reserve petroleum and natural-gas rights resulting in tender bonus bids of $14,297,815.64.

As at December 31, 1967, 34,822,715 acres, or approximately 54,410 square miles, of Crown petroleum and natural-gas rights, issued under the *Petroleum and Natural Gas Act,* were held in good standing by operators ranging from small independent companies to major international ones. The form of title held, total number issued, and acreage in each case were as follows:—

Form of Title	Number	Acreage
Permits	346	23,214,363
Natural-gas licences	------	----------
Drilling reservations	38	462,138
Leases (all types)	4,056	11,146,214
Total		34,822,715

Petroleum and Natural-gas Revenue, 1967

Rentals and fees—		
Permits	$1,369,232.18	
Drilling reservations	86,303.30	
Natural-gas licences	----------	
Petroleum, natural-gas, and petroleum and natural-gas leases	8,901,195.69	
Total rentals and fees		$10,356,731.17

Disposal of Crown reserves—		
Permits	$8,428,408.91	
Drilling reservations	3,013,978.50	
Leases	2,855,428.23	
Total Crown reserves disposal		$14,297,815.64
Royalties—		
Gas	$2,870,655.93	
Oil	6,678,244.53	
Processed products	58,536.56	
Total royalties		9,607,437.02
Miscellaneous fees		17,916.73
Total petroleum and natural-gas revenues		$34,279,900.56

ANALYTICAL AND ASSAY BRANCH

STAFF

S. W. Metcalfe	Chief Analyst and Assayer
N. G. Colvin	Analyst
R. J. Hibberson	Analyst
R. S. Young	Analyst
F. F. Karpick	Assayer

SAMPLES

A reasonable number of samples are assayed, without charge, for a prospector who makes application for free assays and who satisfies the Chief Analyst that prospecting is his principal occupation during the summer. A form for use in applying for free assays may be obtained from the office of any Mining Recorder.

During 1967 the chemical laboratory in Victoria issued reports on 2,402 samples from prospectors and Departmental engineers. A laboratory examination of a prospector's samples generally consist of the following: (1) A spectrographic analysis to determine if any base metals are present in interesting percentages; (2) assays for precious metals and for base metals shown by the spectrographic analysis to be present in interesting percentages. The degree of radioactivity is measured on all samples submitted by prospectors and Departmental engineers; these radiometric assays are not listed in the table below.

The laboratory reports were distributed in the following manner among prospectors who were not grantees, prospectors who were grantees under the *Prospectors' Grub-stake Act,* and Departmental engineers:—

	Samples	Spectrographic Analyses	Assays
Prospectors (not grantees)	2,017	1,947	5,337
Prospectors (grantees)	165	164	410
Departmental Engineers	220	96[1]	546
Totals	2,402	2,207	6,293

[1] An additional 124 spectrographic analyses were done for Departmental engineers but the results were not reported.

Samples submitted to the laboratory for identification are examined by the Mineralogical Branch of the Department. During the year 56 such samples were examined.

Reports were issued on 48 petroleum and natural-gas samples. Of this number, 27 were samples of formation waters from wells being drilled for gas and oil in the Province and 15 were natural-gas samples of the same origin, three were suspected gas seeps, and two were suspected oil seeps. In addition, a sample suspected to be asphalt was examined and found to be excretion of a pack rat.

Reports were issued on 81 samples of coal submitted by the Purchasing Commission for proximate analyses and calorific values.

Reports were issued on 458 samples of a miscellaneous nature. Six hundred and eighty-nine assays and 32 spectrographic analyses were reported in this category; an additional spectrographic analysis was not reported.

For the Minister of Mines and Petroleum Resources, three samples of ore were assayed.

For the Minister of Lands, Forests, and Water Resources, one sample of ore was assayed.

For the Inspection Branch of the Department of Mines and Petroleum Resources, the fuel-oil content of three samples of AN/FO was determined.

For the Field Crops Branch of the Department of Agriculture, one marl sample was analysed for its content of calcium and magnesium oxides, and a sample of soil was spectrographed.

For the Purchasing Commission, the water contents of three samples of liquid soap were determined.

For the Fish and Game Branch of the Department of Recreation and Conservation, a white material near a coal pile was examined and found to be aluminium sulphate.

For the Materials Testing Branch of the Department of Highways, 39 water samples were analysed; brown particles in a sample of water were spectrographed and found to contain iron as the major constituent; a white powder in the Centennial Fountain was examined and found to be calcium carbonate; scum on a water sample and 18 samples of clay were spectrographed.

For the Forest Research Branch of the Department of Lands, Forests, and Water Resources, a rock sample was spectrographed and its potassium content determined.

For Ocean Cement Limited, two samples of slag and two of cement were spectrographed.

For the Smoke Inspector of the City of Victoria, determination was made of the weight of residues collected in 356 bottles of water placed in various locations in the city; for the City Engineer, the specific gravity of seven samples of sea water was determined, and 12 samples of sea water were examined for their fluorescein content.

For citizens of the Province, one sample of natural gas was analysed; a sediment in water was spectrographed, one ore sample was assayed, one coal sample was analysed, one alloy was spectrographed, and a yellow stain on a rock, believed to be due either to uranium or vanadium, was examined and found to be a lichen.

X-ray Powder Diffraction Analyses

Seventy-three analyses of this type were performed for identification purposes.

Examinations for Assayers

The Provincial Government examinations for certificates of efficiency were held in May and December. As a result of the May examination, five candidates passed, two were granted supplementals, and four failed. In the December examination nine candidates were examined, of whom two passed, four were granted supplementals, and three failed.

INSPECTION BRANCH

Organization and Staff

Inspectors and Resident Engineers

J. W. Peck, Chief Inspector	Victoria
J. E. Merrett, Deputy Chief Inspector of Mines	Victoria
L. Wardman, Senior Inspector, Electrical-Mechanical	Victoria
D. R. Morgan, Senior Inspector, Mining Roads	Victoria
V. E. Dawson, Inspector, Mechanical	Victoria
R. J. Craig, Senior Inspector, Environmental Control	Vancouver
S. Elias, Inspector, Environmental Control	Vancouver
A. R. C. James, Inspector and Resident Engineer	Vancouver
W. C. Robinson, Inspector and Resident Engineer	Vancouver
David Smith, Inspector and Resident Engineer	Kamloops
T. M. Waterland, Inspector and Resident Engineer	Kamloops
P. E. Olson, Inspector and Resident Engineer	Nelson
Harry Bapty, Inspector and Resident Engineer	Prince Rupert
W. G. Clarke, Inspector and Resident Engineer	Prince George

An inspection office is maintained at Cranbrook, but at the end of 1967 this appointment was vacant. Inspectors are stationed at the places listed above and inspect coal mines and other mines and quarries in the districts shown on the accompanying Figure 1. They also examine prospects, mining properties, roads and trails, and carry out special investigations under the *Mineral Act*. The Environmental Control Inspectors conduct dust, ventilation, and noise surveys at all mines and quarries, and where necessary make recommendations to improve environmental conditions. D. R. Morgan supervises the roads and trails programme and prospectors' grub-stakes.

Instructors, Mine-rescue Stations

Arthur Williams	Fernie Station
W. H. Childress	Nanaimo Station
T. H. Robertson	Kamloops Station
G. J. Lee	Nelson Station

Staff Changes

J. E. Merrett was transferred from Vancouver to Victoria to replace R. B. Bonar on his retirement at the end of July. D. R. Morgan was transferred from Cranbrook to Victoria to replace E. R. Hughes on his retirement at the end of August. W. C. Robinson was transferred from Victoria to Vancouver to replace J. E. Merrett. His position, that of a special investigator and claims inspector under the *Mineral Act,* was cancelled. On December 12, 1967, R. J. Craig died, and in February, 1968, S. Elias was appointed to his position.

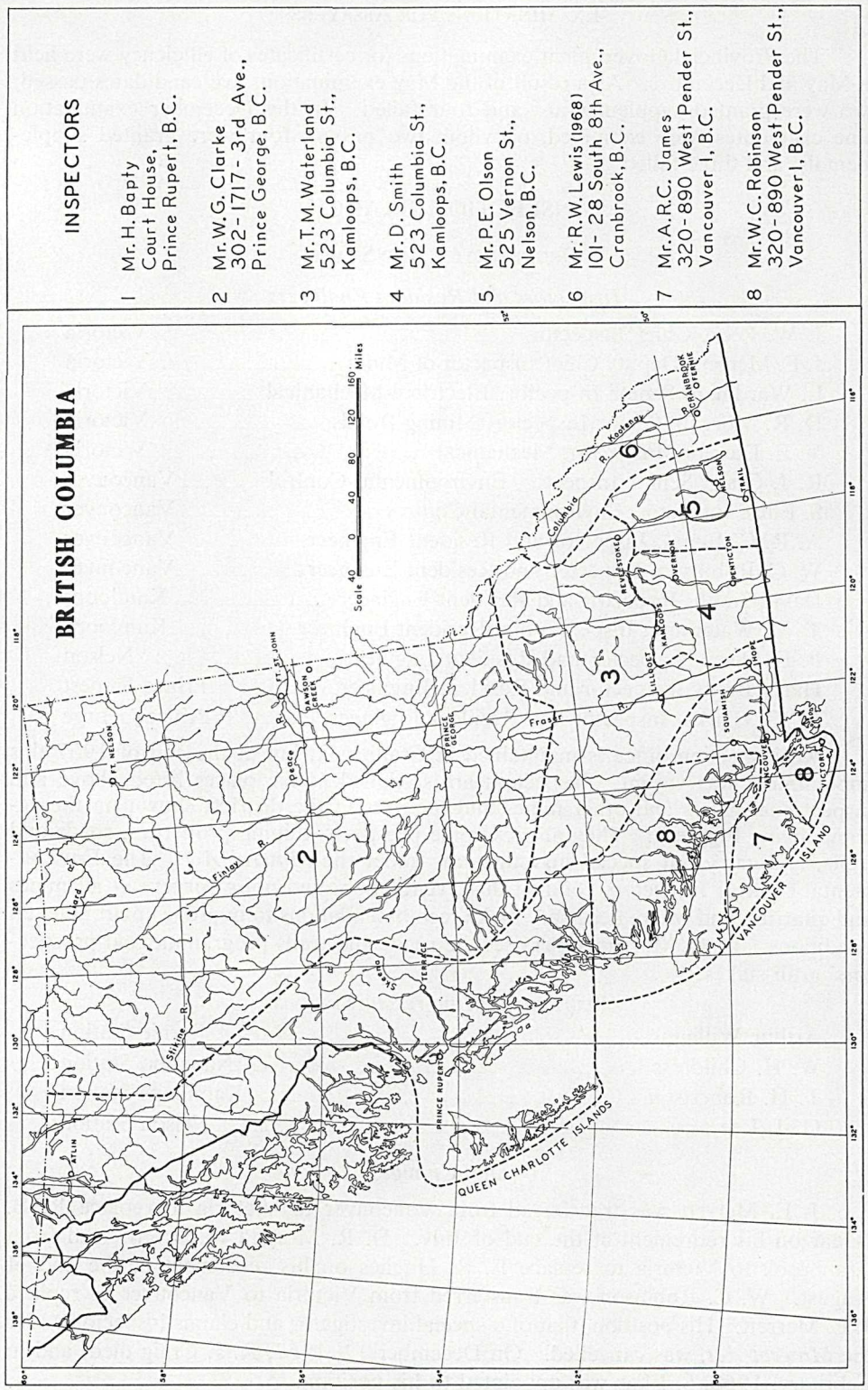


Figure 1. Index map showing inspectoral districts.

Board of Examiners (Coal Mines Regulation Act)

J. W. Peck, Chairman ..... Victoria
A. R. C. James, Member ..... Vancouver
D. R. Morgan, Member ..... Victoria

A. R. C. James, D. R. Morgan, and the mine-rescue instructors for the district in which an examination is being held form the Board for granting certificates of competency to coal-miners.

An Inspector is empowered to grant provisional certificates to coal-miners for a period not exceeding 60 days between regular examinations.

Board of Examiners (Mines Regulation Act)

J. E. Merrett, Chairman ..... Victoria
A. R. C. James, Member ..... Vancouver
W. C. Robinson, Member ..... Vancouver

The Board conducts written examinations in various mining centres for applicants for underground shiftboss certificates. The Board is also empowered to grant provisional certificates without examination and under such conditions as the Board considers necessary.

MINERALOGICAL BRANCH

The Mineralogical Branch supplies general geological information, and information regarding mineral deposits and the mineral industry, provides rock and mineral identification of specimens submitted by prospectors and others, contributes lectures in courses on prospecting, and participates in scientific discussions and educational exhibits.

Field work by officers of the Mineralogical Branch includes areal geological mapping, detailed geological examinations of mineral deposits, examination of properties of current interest, and studies related to engineering geology. The results of major projects are published in a series of bulletins, and shorter reports are published in the Annual Reports of the Minister of Mines and Petroleum Resources.

Technical editing of the Annual Report of the Minister of Mines and Petroleum Resources and other publications is the responsibility of Stuart S. Holland. Copy for printing is prepared by and under the direction of Mrs. Rosalyn J. Moir.

Professional Staff

On December 31, 1967, the professional staff included the following geologists:—

M. S. Hedley ..... Chief of the Branch
Stuart S. Holland ..... Deputy Chief of the Branch
J. M. Carr ..... Geologist
N. C. Carter (on leave of absence) ..... Geologist
G. E. P. Eastwood ..... Geologist
James T. Fyles ..... Geologist
E. W. Grove ..... Geologist
R. V. Kirkham (on leave of absence) ..... Geologist
J. W. McCammon ..... Geologist
N. D. McKechnie ..... Geologist
K. E. Northcote ..... Geologist

V. A. G. Preto ..... Geologist
A. F. Shepherd ..... Geologist
A. Sutherland Brown ..... Geologist

All are registered professional engineers or are applying for registration, and most have a Ph.D. degree.

Staff Changes

W. G. Jeffery, geologist, resigned, effective June 20, 1967.

V. A. G. Preto, geologist, a graduate of the University of British Columbia and a Ph.D. from McGill University, joined the staff on July 1, 1967.

K. E. Northcote, geologist, a graduate of the University of British Columbia and a Ph.D. from the University of British Columbia, joined the staff on November 1, 1967.

R. V. Kirkham continues to be on leave of absence to continue postgraduate study at the University of Wisconsin.

N. C. Carter continues to be on leave of absence to continue postgraduate study at the University of British Columbia.

Field Work, 1967 Season

J. M. Carr mapped the geology of the Brenda Lake area west of Peachland.

N. C. Carter made a study of the age of copper and molybdenum deposits in the Babine, Tahtsa, Smithers, and Alice Arm areas.

G. E. P. Eastwood began an inventory of the mineral deposits of Vancouver Island.

James T. Fyles spent about a month with E. W. Grove in the Unuk River area and studied several molybdenite and other deposits in the Kootenays.

E. W. Grove completed the geological mapping of an area between the Granduc mine and the Unuk River.

R. V. Kirkham completed a geological study of Hudson Bay Mountain and the Glacier Gulch molybdenum deposit.

J. W. McCammon studied non-metallic industrial mineral deposits in the southern part of the Province.

N. D. McKechnie examined various mines and prospects in the southern interior and on Vancouver Island.

V. A. G. Preto studied copper deposits in the Kamloops-Princeton region and elsewhere.

A. Sutherland Brown continued the investigation of deposits of copper and molybdenum in the central interior of the Province, combined with R. V. Kirkham to map an area north of Hudson Bay Mountain, and studied coal resources in several areas.

A total of 11 field assistants was employed on the various mapping projects undertaken in 1967.

Airborne Magnetometer Mapping

The project of airborne magnetometer mapping, jointly financed by the Geological Survey of Canada and the British Columbia Department of Mines and Petroleum Resources, continued in 1967. The contractor, Spartan Air Services Ltd., did the field work, covering 46 map-sheets, mostly in 93N, 93M, 103P, and 94D lying between latitudes 55 degrees and 57 degrees.

Seventeen aeromagnetic maps at a scale of 1 mile to 1 inch covering part of the area flown in 1966 were released on May 21, 1968. The maps may be obtained

from the British Columbia Department of Mines and Petroleum Resources, Room 411, Douglas Building, Victoria, or the Geological Survey of Canada, 326 Howe Street, Vancouver 1.

The basic data used in compiling the maps are on open file at the Geological Survey of Canada in Ottawa, where interested parties may arrange to obtain them for special processing.

The Department of Energy, Mines and Resources (Observatories Branch) operates a magnetic observatory at Victoria. Services available to geophysical exploration companies and other interested agencies include:—

(*a*) Three-hour range indices of magnetic activity; these provide a measure of the intensity of the magnetic disturbance (on a 0–9 scale) for each three-hour period. The monthly listings of these indices are normally mailed within a few days after the end of each month.

(*b*) Copies of magnetograms are available through a local duplicating firm at a charge of $7.50 for a monthly set. These recordings of the magnetic field can be used to control field surveys, in particular to correct for the diurnal changes and magnetic disturbances. The area over which this control is valid depends on the required accuracy; for ±5 gamma accuracy, it covers an elliptic region reaching roughly as far as longitude 118 degrees to the east and latitude 50.5 degrees to the north.

Further details can be obtained by writing to the Officer-in-charge, Victoria Magnetic Observatory, R.R. 7, Victoria.

PETROLEUM AND NATURAL GAS BRANCH

The Petroleum and Natural Gas Branch is responsible for the administration of the Regulations Governing the Drilling of Wells and the Production and Conservation of Oil and Natural Gas, and the Regulations Establishing Gas-Oil Ratio Adjustment Factors, Oil Production Allowables, Overproduction and Underproduction, made pursuant to the *Petroleum and Natural Gas Act*.

The drilling regulations provide for the use of efficient and safe practices in the drilling, completion, and abandonment of wells; for the orderly development of fields discovered within the Province; and for the conservation and prevention of waste of oil and natural gas within the reservoir and during production operations.

The regulations concerning gas-oil ratio factors, production allowables, and overproduction and underproduction provide for conservation of reservoir energy by limiting the volume of oil that can be produced during any day, month, or year from a well or pool in accordance with the schedule of gas-oil ratio adjustment factors. The factors, which are applied against oil production, are applicable when the average volume of gas produced with each barrel of oil exceeds a specified level, and when applied result in reduction of the producing rate. Overproduction and underproduction are adjusted on a monthly basis.

Every well location must be approved by the Branch before the well is drilled. All operations related to drilling and production are inspected frequently to ensure compliance with all regulations, including such features as facilities and practices used, adequate plugging of abandoned wells, surface restoration of well-sites, well testing and measurement procedures employed, disposal of produced water, protection of installations against fire, and general conservation.

Investigations are made of complaints of property damage resulting from drilling and producing operations, and from geophysical work programmes.

Comprehensive records of all drilling and producing operations are maintained at Victoria and are made available for study, or are published, for the use and benefit

of anyone interested in oil or gas development in British Columbia. Samples of bit cuttings, as well as all core, obtained from every well drilled in the Province are collected and retained at the field office at Charlie Lake, where they may be studied by interested persons. Charlie Lake is adjacent to the Alaska Highway about 5 miles northwest of Fort St. John.

Detailed reservoir engineering and geological studies are conducted on the basis of technical information submitted to the Branch from operating companies, as well as information acquired through field work by Branch personnel. Estimates of the reserves of oil and natural gas are made twice a year, at the end of June and December. Crown-owned oil and natural-gas rights are evaluated prior to their disposal by public tender.

Administration

The Petroleum and Natural Gas Branch is subdivided for administrative purposes into three sections—namely, Development Engineering, Reservoir Engineering, and Geology. The Development Engineering and Geology sections are supervised by W. L. Ingram and S. S. Cosburn respectively. Following the resignation, in July, of the Senior Reservoir Engineer, responsibility for the Reservoir Engineering section was assumed temporarily by K. C. Gilbart.

The field office at Charlie Lake, which includes the core and sample laboratory, is supervised by the District Engineer, G. E. Blue.

Staff

Headquarters, Victoria

J. D. Lineham	Chief of Branch
W. L. Ingram	Deputy Chief of Branch and Senior Development Engineer
M. B. Hamersley	Development Technician
J. F. Tomczak	Statistician
R. R. McLeod (until July 24th)	Senior Reservoir Engineer
K. C. Gilbart	Reservoir Engineer
G. V. Rehwald (until August 31st)	Reservoir Engineer
P. K. Huus	Reservoir Technician
S. S. Cosburn	Senior Petroleum Geologist
H. B. Fulton (until October 17th)	Petroleum Geologist
D. L. Griffin	Petroleum Geologist
J. E. Hughes	Petroleum Geologist
A. S. Nemeth	Petroleum Geologist

The headquarters staff includes also two geological draughtsmen, one clerk-stenographer, four clerks, and three clerk-typists.

Field Office, Charlie Lake

G. E. Blue	District Engineer
D. L. Johnson	Field Engineer
D. A. Selby	Field Technician
G. T. Mohler	Field Technician
W. B. Holland	Field Technician
L. A. Gingras	Field Technician

The field office staff includes also three core and sample laboratory assistants and one clerk-stenographer.

Staff Changes

L. A. Gingras, field technician, joined the staff on January 3rd.
A. S. Nemeth, petroleum geologist, joined the staff on March 1st.
R. R. McLeod, reservoir engineer, resigned, effective July 24th.
G. V. Rehwald, reservoir engineer, resigned, effective August 31st.
H. B. Fulton, petroleum geologist, resigned, effective October 17th.

Board of Arbitration

Chairman: A. W. Hobbs, solicitor, Department of the Attorney-General. Members: S. G. Preston, agrologist, Department of Agriculture; J. D. Lineham, engineer, Department of Mines and Petroleum Resources. The latter was appointed on June 27th, replacing R. R. McLeod.

The Board of Arbitration, established under the authority of the *Petroleum and Natural Gas Act,* grants right of entry by oil and gas companies upon alienated land and determines conditions of entry and compensation therefor. It also terminates the right of entry when a company has ceased to use the land.

A hearing was held at Fort St. John on July 24th at which 10 applications carried over from 1965 and 1966 were heard and subsequently settled by Board awards. Also heard was the matter of a dispute concerning whether or not the Board had jurisdiction to grant right of entry for the purpose of installing pipe-line facilities necessary to transport gas from a well-head to the gas-gathering system. It was decided that the Board had jurisdiction and, subsequently, six orders were made for immediate right of entry.

Two applications on which right of entry had been granted in July, 1966, were settled by agreement between the parties involved.

Conservation Committee

Chairman: K. B. Blakey, Deputy Minister of Mines and Petroleum Resources. Members: N. D. McKechnie, geologist, Department of Mines and Petroleum Resources; M. H. A. Glover, economist, Department of Industrial Development, Trade, and Commerce.

The Conservation Committee is responsible to the Minister of Mines and Petroleum Resources and was established on October 11, 1957, under the authority of the *Petroleum and Natural Gas Act.* Its duties are as follows:—

(1) To act as an advisory committee to the Minister on such questions of conservation that the Minister, in writing, shall refer to the Committee for consideration and recommendation.
(2) To deal with such questions of conservation and production in the various fields of British Columbia as may arise between two or more operators in the same field or between operators and the Branch when appeals on such questions are made to the Minister and referred by him to the Committee.

The Conservation Committee did not meet in 1967.

GRUB-STAKING PROSPECTORS

Under the authority of the *Prospectors' Grub-stake Act* the Department has provided grub-stakes each year since 1943 to a limited number of applicants able to qualify.

Grub-stakes up to $500 for food, shelter, and clothing, plus a reasonable travelling allowance, are available to a limited number of qualified prospectors who undertake to prospect in British Columbia in areas considered favourable by the Depart-

ment in accordance with a long-range plan for the development of the Province. Experienced prospectors may be granted a maximum of $300 for travelling expenses where prospecting is to be done in remote areas where air transportation is necessary.

Application forms and terms and conditions under which grub-stakes are granted may be obtained from D. R. Morgan, Senior Inspector, Department of Mines and Petroleum Resources, Victoria.

GRUB-STAKE STATISTICS

Field Season	Approximate Expenditure	Men Grub-staked	Samples and Specimens Received at Department Laboratory	Mineral Claims Recorded
1943	$18,500	90	773	87
1944	27,215	105	606	135
1945	27,310	84	448	181
1946	35,200	95	419	162
1947	36,230	91	469	142
1948	35,975	92	443	138
1949	31,175	98	567	103
1950	26,800	78	226	95
1951	19,385	63	255	137
1952	19,083	50	251	95
1953	17,850	41	201	141
1954	19,989	48	336	123
1955	21,169	47	288	183
1956	20,270	47	163	217
1957	22,000	46	174	101
1958	24,850	47	287	211
1959	21,575	38	195	202
1960	28,115	50	358	241
1961	29,175	47	309	325
1962	26,730	52	233	189
1963	29,000	50	150	843
1964	31,751	53	213	351
1965	24,717	42	241	219
1966	26,787	43	224	239
1967	29,891	47	148	432

Samples and specimens received from grub-staked prospectors are spectrographed, assayed, and tested for radioactivity. Mineralogical identifications are made on request.

Seventy-two applications were received in 1967, and 47 grub-stakes were authorized. Two grantees were unable to go out, and their initial payments were returned. Grantees who were unable to complete the terms and conditions of the grant received only partial payment. Fourteen prospectors were given grants for the first time. Seven grantees proved to be unsatisfactory. A few grantees used aircraft for transportation to their prospecting areas. Two grantees were taken ill and were unable to continue prospecting.

D. H. Rae interviewed applicants in Vancouver and contacted 26 grantees in the field to give advice and direction to those who needed it. The following notes are Mr. Rae's summaries of the prospecting activities and results. They are based on observations made by him in the field and from information contained in the diaries of the grantees.

Alberni Mining Division.—Some prospecting was done in the west Cameron River valley; a considerable amount of graphitic material in schistose rock was reported. Prospecting was also carried on in belts of limestone near Horne Lake. Nothing of interest was reported there, or near Patterson or Father and Son Lakes.

On the east side of Great Central Lake, about 10 miles from Port Alberni, an important mineralized zone was discovered; claims were located and a considerable amount of prospecting was done. The main zone exposes a width of 10 feet of gossan material containing copper carbonates and chalcopyrite.

North of Sproat Lake, about 20 miles from Port Alberni, copper mineralization in andesite was thoroughly prospected; some good assay values were obtained from a wide zone. Other outcrops of granite and volcanics were investigated. Narrow stringers and disseminations of bornite were found in the granite.

A camp was established on Silver Creek at the head of Uchucklesit Inlet, and this rugged area was prospected. Limestone, pyritized skarn, and diorite containing some magnetite were reported.

Close to the half-way point on the Port Alberni–Ucluelet road, claims were located on a small exposure of magnetite showing minor amounts of molybdenite. A considerable amount of work was done on this ground, but no further information was submitted.

Atlin Mining Division.—A base camp was established beside a small lake, locally known as Redfish Lake, lying about 15 miles due south of the east end of Swan Lake. Three weeks were spent prospecting the area within reasonable reach of the camp, but the results of the work were disappointing. The underlying rock throughout the area is coarse-grained granite showing considerable reddish feldspar. Several small barren gossans were examined; a few narrow pegmatite dykes were seen; small amounts of molybdenite and chalcopyrite were found in quartz stringers; and a few small pieces of copper-bearing float were picked up. Panning of the streams in the area was unproductive.

Some work was done north of Tootsee Lake. It was found that granite underlies much of the area. Some fairly important gossans were found containing minor amounts of pyrrhotite and magnetite, and one exposure of quartzite containing limonite was examined, but nothing of economic interest was discovered.

In the Talbot Creek area (6 miles south of Mile 90 on the Haines Road), outcrops of limestone, marble, and some shale were observed. Nothing else was reported.

A short time was spent prospecting an area adjacent to Datlaska Creek (4 miles west of Kelsall Lake). The geology of the area is fairly complex. Outcrops of pyroxenite, gneiss, volcanic breccia, argillite, serpentine, and limestone were examined; float containing minor amounts of scheelite and chalcopyrite was picked up, but nothing of importance was reported.

Cariboo Mining Division.—Prospecting was done in the Torpy River valley, where some trenching on several outcrops exposed heavy mineralization of pyrite, chalcopyrite, and copper carbonates. There seems to be very little continuity to this mineralization, but further work is warranted. The rock exposures are mainly quartzite showing a considerable amount of quartz and calcite, schist, and black limestone containing small amounts of pyrite and chalcopyrite.

Six miles north of Sinclair Mills some work was done in an area underlain by basic rocks. Nothing of interest was reported.

Prospecting was done 20 miles southwest of Prince George where the exposed rocks are mainly basic types including some serpentine.

East of Prince George, near Purden Lake, a granite-limestone contact was prospected, and along the Willow River some barren-looking quartz veins were examined. Nothing of interest resulted from any of this work.

A base camp was established at an old placer mine in Pearce Gulch, about a mile south of the Cariboo-Hudson mine. From this camp, and by setting up a

number of fly camps, a large area was prospected. Nothing of economic importance was found, but the following observations were made: Grouse Creek—barren quartz veins in schist; Mount Guyet—folded black limestone, phyllite, quartzite, and a few narrow quartz veins; McNeill Creek—limestone and quartzite carrying some iron pyrites. A considerable amount of work was done in the Cunningham and McBean Creek areas, but nothing of interest was reported. At Nugget Mountain the rock exposures are mainly pyritized slate, grey quartzite, and chlorite schist; at Craze Creek—schistose quartzite; at Antler and Victorian Creeks—quartz-sericite schist; at Pitman Creek—black argillaceous schist; at Copper Creek—minor amounts of scheelite associated with a fault zone; at Pearce Gulch—limestone and schist; at Roundtop Mountain—limestone. Eight claims were located in the Trehouse Creek valley, and the ground was carefully prospected. The underlying rocks were found to be slate, slaty schist, and quartz-sericite schist containing narrow quartz stringers. Very few rock outcrops were seen near Simlock or Harveys Creeks. At Peter Gulch argillaceous schist, a gossan area, some shear zones, and barren quartz veins in quartzite were reported. At the head of French Snowshoe Creek some prospecting was done in an area underlain by dark-coloured sericite schist, quartzite, and conglomerate. At the head of Cunningham Creek an anticlinal structure was examined.

Clinton Mining Division.—Some work was done in the Maiden Creek area, where the underlying rocks are mainly limestone, conglomerate, and red sandstone. Nothing of interest was reported.

Near Jesmond, veinlets of grey copper were found along a limestone contact.

Greenwood Mining Division.—The following information was submitted from the Goatskin Creek-Rendell Creek areas. Observed rock exposures include syenite with narrow quartz stringers, granite, rhyolite, basalt, micaceous schist, quartz diorite, limestone, and serpentine in varying amounts over a wide area. Nothing of economic interest was reported.

In the Conkle Lake area the geology was reported to be fairly complex. Several fault zones, pyritized serpentine, narrow dykes and sills, granite, and granodiorite were observed.

In the vicinity of Baldy Mountain, coarse granite, quartz pegmatite dykes, rusty-coloured chert, limestone, and schist were reported.

Kamloops Mining Division.—Near Lytton, dolomitic seams in a quartzose dyke were found to contain disseminated cinnabar, and just south of Walhachin small pockets of chalcocite were noted in several rock exposures.

Some work was done in the Raft River valley, a very rugged area where outcrops of basalt, granite, and barren volcanics were reported.

A base camp was established at O'Connor Lake, which lies on the west side of the North Thompson River about 20 miles from Kamloops. From there a large area was prospected, both conventionally and by using geochemical methods. Nothing of economic importance was reported, but the following general information was submitted: Discouraging results were obtained from the soil-testing, which was conducted after careful traversing of the area; much of the ground is covered with deep overburden; outcrops of limestone, various types of metamorphic rocks, granite, schist, and shale were investigated; some minor mineralization was noted in both metamorphic rocks and granite in the form of disseminated hematite, pyrite, and arsenopyrite; several old mine workings were examined. No staking was done, and little of economic interest was reported.

In the Mount Hagen area, near Gorman Lake, granite intrusives were encountered, and some exposures of chloritic-sericitic rock containing quartz and graphite were examined. In the Fadear Creek valley, and near Cicero Creek, ser-

pentine was found, and some lead-zinc float was picked up near Mount Fadear. Some work was done near Forest, Saskum, and North Barriere Lakes, and in the Harper and Chuck Creek areas. On the Wood Lake road, outcrops of granodiorite and andesite were examined. Northeast of Barriere, the underlying rocks are diorite, granite with considerable feldspar, and graphitic schist.

Several base camps were established in an area roughly 10 miles north and northeast of the north end of Adams Lake. This sector is made accessible by numerous logging-roads, but field work was hampered by excessive overburden. In general the geology was not favourable. The following general information was furnished by the prospector: Beaver Creek valley—granodiorite; Harbour Creek valley and Harbour Lake area—chlorite schist and mica schist; Gannett Mountain —granite and some metamorphic rocks; Wallace Creek—chlorite schist and mica schist; Meadow and Cayeene Creek areas—argillite; Samatosum Creek—some sedimentaries and some volcanics; and Spapilem Creek—granite, gneiss, and quartzite. In the Tumtum Lake area much overburden was encountered, but some outcrops of granite and mica schist were examined.

South of Johnson Lake, outcroppings of both sedimentary and volcanic rocks were investigated.

On the west side of Mara Lake, phyllites and schists were found to be well pyritized.

A short aerial survey of part of the Adams Plateau was undertaken by helicopter; numerous landings were made, float material was examined, rock exposures investigated, and silt samples were taken. Nothing of importance was found.

Liard Mining Division.—Several main base camps were established in the general vicinity of Dall Lake. Fly camps were also used at a number of convenient locations, and a large area was prospected during the season. Near Colt Lake and east toward the Kechika River, the underlying rocks are mainly quartzite, sericite schist, and a few greenstone dykes. Veinlets of radioactive fluorite, some copper sulphides in narrow quartz stringers, and limestone containing narrow bands and disseminations of pyrrhotite were prospected. In the Hizaza Creek valley, metamorphosed limestone and shale; quartz veinlets showing green chlorite, muscovite, and siderite; and quartz stringers in graphitic schist were noted. Near the southeast corner of Dall Lake the following features were reported: Limestone gossans with associated calcite and other carbonates; pyritization along an intrusive contact; small pieces of lead and zinc sulphide float; limestone float with some iron pyrites; and narrow quartz veins with minor amounts of chalcopyrite in schist. Along Moodie Creek some faulting and shearing were found, and chloritic quartz stringers in schist carry minor amounts of chalcopyrite. Eight miles northwest of Moodie Creek, on the Turnagain River, a medium-sized pyritized zone in sediments was prospected. Nothing of immediate economic interest was reported from all this work.

Lillooet Mining Division.—A small amount of prospecting was done up the Yalakom River valley and in the Bridge River district.

Nanaimo Mining Division.—Some work was done at the headwaters of the Gold River. This was a continuation of a programme that was started in the area in 1966. Nothing of importance was reported.

Some distance north of the Gold River valley, copper-bearing float was found in an area underlain by andesite.

The Mount Kains area near the north end of Vancouver Island was prospected. Access is by logging-road, and the area is difficult to prospect owing to rugged terrain, lack of rock exposures, and heavy undergrowth. It was found that the posi-

tions of certain magnetic anomalies were hard to reach. Sketch maps showing the complex geology were submitted.

Some prospecting was done about 10 miles west of Duncan.

Nelson Mining Division.—Some prospecting was done 8 miles west of Tye, in the Cultus Creek valley, and between Lake and Midge Creeks. In the Hughes Creek valley, oxidized and copper-stained float was picked up, and a fine-grained oxidized dyke was prospected. In the Midge Creek valley, some float was found but nothing of further importance was reported.

By using an old cabin 12 miles up Cultus Creek from Tye as a main base of operations and establishing several other temporary camps at convenient locations, a considerable area was prospected in the general vicinity of the old Bayonne mine. Nothing of economic importance was reported.

In the Rossland area, at Grouse Ridge and Baldy Mountain, granite and argillite are the common underlying rocks. A considerable amount of chalcopyrite was found in the dump at the old Lake Mountain mine, and in the vicinity both monzonite outcrops and conglomerate containing small amounts of galena were reported. Near Monte Cristo Mountain, float quartz showing minor amounts of molybdenite was picked up; at Deer Park Mountain, exposures of granite and argillite were seen; and up Tiger Creek, float containing some mixed sulphides was found. Nothing of economic interest was reported.

In the Boundary Creek area, along Grass Creek, some work was done along a schist-gneiss contact, where a quartz vein carrying values in copper, silver, and molybdenite had been uncovered. Near the junction of Nun and Monk Creeks, some chalcopyrite float was picked up, and altered limestone carrying low values in lead and silver was prospected. At North Star Mountain, limestone outcrops showed minor amounts of fine galena. In the Corn Creek valley, some work was done on quartz veins which occur in limestone, on altered limestone containing some siderite, and on quartz veins containing small amounts of chalcopyrite and galena. No commercial ore was discovered.

New Westminster Mining Division.—In the Chehalis River area a 9-foot quartz vein, showing complex copper, zinc, gold, and silver mineralization, was prospected. Assay values were low.

Nicola Mining Division.—North of Stump Lake, near Frogmoore Creek, claims were located on an exposure of chalcocite in andesite, and on narrow bands of bornite along a granite contact. Further work will be done on the claims.

Omineca Mining Division.—Close to the north end of Whitesail Lake, some magnetite float and pyritized granite containing minor amounts of chalcopyrite were found. At Coles Creek a considerable amount of argillite is exposed and a gossan area was examined. At the east end of Tahtsa Lake a heavily pyritized zone was exposed. At Cheslatta Lake the rock exposures are schist, gneiss, granite, and granodiorite. On Huckleberry Mountain copper-stained outcrops were examined. Near Mosquito Hills float carrying bornite and chalcopyrite was picked up, and on Smaby Creek patches of magnetite were found to contain narrow stringers of bornite and chalcopyrite. Some inconclusive work was done near Musclow and Michel Lakes and in the McCuish and Falls Creek areas. Near Goodrich Lake several narrow copper-bearing veins were exposed, and at Cosgrove Lake a gossan containing small amounts of bornite and chalcopyrite was investigated. Some work was done around Sandifer Lake; at Spud Lake several small gossans were prospected, and exposures of basalt, gabbro, and limestone were noted; traces of chalcopyrite and pyrite were also seen. Near Coyote Lake the underlying rocks are basalt and limestone, and some quartz stringers and a small amount of perlite were seen.

Some inconclusive work was done near Gale Lake, on Chikamin Mountain, and up Troitsa Creek. Near Sweeney Mountain, outcrops of pyritized volcanic rocks were investigated.

Some work was done around a pinkish-coloured plug of diorite in the Shelford Hills, where epidote and narrow quartz veins were seen.

The easterly slopes of the Wolverine Range due east from Manson Creek received some attention, and outcrops of limestone and quartzite were examined; traces of copper sulphides were found but assays of samples taken were disappointing. Some prospecting was done near Manson Creek: Near the first of the Manson Lakes, one outcrop showed traces of nickel; in the Darkwater Creek area, quartzite, skarn, limestone, and lightly mineralized schist were reported; at central Lost Creek a small showing of nickel silicate was examined; at upper Lost Creek altered argillite showed small amounts of scheelite; and at Boulder Creek small amounts of galena, scheelite, and nickel silicate occur along a granite-limestone contact.

Sixty miles south of Manson Creek and about 5 miles east of the mining-road, a fairly extensive outcropping of skarn was located and prospected; disseminated molybdenite and powellite are visible in part of the skarn, but assays of samples were low.

Base camps were established about 60 miles from Finlay Forks, to the north and to the northeast, and some prospecting was done in these areas. The following information was submitted at the end of the season: Chowika Creek valley—thin beds of limestone; Deserters Peak—sandstone and narrow coal seams, and iron pyrites in quartz stringers; Akie River area—schist, shale, conglomerate, and limestone, with minor showings of chalcopyrite and galena; Akie Range—quartz veins containing interesting amounts of pyrite; and at Del Creek—outcrops of barren chlorite schist.

A base camp was established 80 miles south of Burns Lake, on the north side of Oppy Lake near the west end. The season was spent prospecting the north side of the lake commencing at about a mile from the shoreline. The area is underlain by volcanic rocks, some syenite, argillite, quartzite, and a few lightly mineralized porphyry dykes. A considerable amount of time was spent stripping and opening up a shear zone containing copper carbonates, chalcopyrite, and pyrite. This work was hampered by deep overburden and very bad weather. The area adjacent to the shear zone is covered with heavy underbrush and windfalls. These showings warrant further investigation.

Two discoveries were made in the McConnell Lake area—one copper, the other copper and molybdenum. No information regarding the geology or extent of these mineral zones was submitted, but the samples brought out are interesting and assays returned commercial values. The following general information on the area was submitted: At Meadow Creek—copper float was picked up; at Dewar Peak—copper float was also found; at Fredrickson Peak—a granite-greenstone contact was prospected; and at Serrated Peak—finely disseminated chalcopyrite was found associated with epidote and magnetite.

In the Kitsumkalum Lake area, diorite and granite exposures were common around Sand Lake and in the Goat River valley, and at Maroon Creek argillite and greywacke were observed. Southwest of Kispiox, outcrops of pyritized diorite, granodiorite, and argillite were examined; and at Date Creek, outcrops of shale, argillite, granodiorite, and sandstone were reported. East of Cedarvale a sample of float containing low values in gold, silver, and lead was found in an area underlain by argillite and greenstone showing patches of magnetite. North of Cedarvale, at the Cranberry River and at Mill Creek, outcrops of shale and argillite were observed.

In the Blunt Mountain area (southeast of Hazelton) some prospecting was done where argillite, chert, and obsidian containing narrow quartz stringers are fairly common. At Mount Thomlinson, shale, argillite, granodiorite, and greywacke outcrops were exposed. In the Sediesh Creek valley, the underlying rocks appear to be mainly argillite and pyritized bands of quartzite. Several pieces of float, well mineralized with molybdenite and other sulphides, were picked up, but the source of these was not found. At Utsun Creek, outcrops of argillite were found to contain large crystals of pyrite.

North of Perow volcanic rocks are common, and near Topley Landing some inconclusive soil-testing was done.

Osoyoos Mining Division.—Near Apex Mountain, heavy pyritization was prospected along a granite contact. Samples were taken of massive pyrrhotite carrying disseminations of chalcopyrite, and fairly good assays were obtained. Granite and limestone were found in the Mount Brent area.

In the Ashnola River valley, younger granitic dykes were found to contain some chalcopyrite, and quartz stringers with minor galena.

More prospecting was done near Allendale Lake, where bornite and copper carbonates were found in coarse-grained granodiorite. This area warrants further prospecting.

Some work was done in the Peachland Creek valley, in an area underlain by granite, andesite, and conglomerate.

Revelstoke Mining Division.—Some work was done on Legerwood Creek, 5 miles northeast of Malakwa, where the principal underlying rocks are pinkish granite, gneiss, and mica schist. Small amounts of fine molybdenite were seen in the granite.

Some work was done in the Tangier Creek watershed, around Mount Tilley, and on Quartz Creek.

On the east side of Trout Lake north of Gerrard, outcrops of siltstone and phyllite mineralized with pyrite and pyrrhotite were examined. In the Trout Creek valley skarn float fairly well mineralized with mixed sulphides was found.

The following information was submitted from work done in the general vicinity of Revelstoke: Greely Creek—porphyry with much disseminated pyrrhotite and pyrite, and minor chalcopyrite; between Anstey Arm and Columbia River—many gossans were observed; Silver Creek—phyllite, schist, and calcareous rocks, but no mineralization; Hanner Lake—peridotite; Freeze Creek—muscovite granite, phyllite containing pyrrhotite, granodiorite (sulphides more common in altered sediments); at Montana Lake—heavily mineralized skarn was prospected; some work was done in the valleys of Drimmie and Greenslide Creeks; near Mount Macpherson, between Begbie Creek and Tumtum station, outcrops of highly siliceous metamorphic rocks, schists, and gneisses were found to be fairly well mineralized; at Horsefly Creek—a mineralized shear zone was investigated; at Watson Creek—breccia float was found to contain flakes of graphite.

Similkameen Mining Division.—In the Princeton area, on the north side of Granite Creek, exposures of volcanic rocks and chlorite schist were prospected.

Skeena Mining Division.—An attempt made to get up the Exstew River by canoe failed because the water was too high at the time. Some prospecting was done south of Williams Creek, but nothing of importance was reported. East of Kitimat, exposures of impure limestone were examined and near Fire Mountain prospecting was done where outcrops of diorite and limestone were exposed.

East of Horetzky Creek near The Jaws, an important mineral zone was located. The zone is characterized by large pods of bornite and chalcopyrite in granite plus

extensive areas of green and blue copper carbonates. High assays were obtained from samples taken from the zone.

Slocan Mining Division.—Near the headwaters of Eagle Creek, east of Granby River, small arounts of copper, mercury, and zinc mineralization were reported; at Galloping Creek some copper mineralization was seen; and at Winnifred Creek some quartz float containing molybdenite was found. In the Inonoaklin Mountain area, float carrying fine disseminated molybdenite was picked up and some pieces of silver-lead float were found. The source of this material was not found. Near Barnes Creek lightly mineralized quartz float was found. At Bisson Lake some claims were located on what was reported to be showings of cinnabar in volcanics. North of Lightning Peak, claims were located on a mineral zone carrying values in nickel, silver, and lead.

Using a float camp at Verandah Point on the east side of Kootenay Lake as a base, considerable work was done north and south along the lakeshore. The geology is not favourable; most of the rock exposures encountered were unaltered crystalline limestone with no evidence of mineralization, barren mica, or hornblende schist. Specks of scheelite were seen in several narrow pegmatite dykes.

Claims were located up the Kaslo River, on Blue Ridge, where encouraging mineralization of bornite and galena was found in quartz veins. Much galena float was picked up, and some high assays in lead and silver were obtained.

Some prospecting was done on the east side of Duncan Lake.

Some inconclusive work was done in the New Denver area, where float containing galena and sphalerite was picked up.

On Perry Ridge, south of Slocan City, gneisses and schists showed considerable graphite and garnet.

Between Needles and Nakusp some exposures of granite and altered granite with a varied sporadic showing of sulphides were examined. Nothing of interest was reported.

Vancouver Mining Division.—North of Alice Lake in the Squamish area, exposures of galena and sphalerite in altered limestone received some attention.

Vernon Mining Division.—Prospecting was continued in the area close to the junction of Harris and McAuley Creeks.

Some work was done in other parts of the Vernon area.

Early in the season an attempt was made to initiate a prospecting programme a few miles south of Monashee Pass. Snow conditions interfered and the work was abandoned.

Some claims were located north of Kingfisher Creek, west of the north end of Mabel Lake and in the Joss Mountain area.

High up in the Whiteman Creek valley, outcrops of gneiss were found to contain pyrrhotite and minor amounts of both chalcopyrite and pyrite. Geochemical investigations were made in the Ewings Landing area.

Victoria Mining Division.—Some prospecting and locating was done a few miles west of Duncan.

MINING ROADS AND TRAILS

Provision is made in the *Department of Mines and Petroleum Resources Act* whereby the Minister may, with the approval of the Lieutenant-Governor in Council, authorize the expenditure of public funds for the construction or repair of roads and trails into mining areas. Assistance on a half-cost basis may also be provided on roads and trails to individual properties. Application forms may be obtained from D. R. Morgan, Senior Inspector, Department of Mines and Petroleum Resources, Victoria.

Requests for road and trail assistance must be made to the Department before the commencement of work. The type of access upon which assistance may be given depends upon the value of the property, the stage of development, and the amount of work to be done. A trail is sometimes sufficient for initial exploration, and a tractor-road may be adequate for preliminary work. Subsequent development might warrant assistance on the construction of a truck-road. A carefully drawn sketch or plan of the location of the road is required to be submitted and, where warranted by the amount of assistance requested, a report on the property by a professional geological or mining engineer may be required. An engineer from the Department may be required to report on the property before a grant is made and to inspect the road after the work has been done.

The total mileages and disbursements under " Grants in Aid of Mining Roads and Trails " during the 1967/68 fiscal year were as follows:—

	Miles	Cost
Roads—		
Construction	146.1	$229,010.12
Maintenance	235.5	40,220.32
Bridges—		
Maintenance		23,000.00
Construction		2,630.99
Total		$294,861.43

In addition to the above, work was continued on the Stewart–Cassiar road, which is being constructed under the " Roads to Resources " agreement between the Governments of Canada and British Columbia. The construction is supervised by the Department of Highways on behalf of the Department of Mines and Petroleum Resources. The only new road construction was on Project No. 1391, the 29.08-mile section between Burrage River and Ningunsaw River, the contract for which was awarded on November 18, 1965, to Ben Ginter Construction Company in the amount of $3,978,553.50 and started in 1966. Operations have been suspended each winter owing to climatic conditions. The project was 30 per cent completed at the end of 1967.

Further construction was done on the Bell-Irving No. 1 bridge, which is approximately 58 miles north of Stewart. The Benray Bridge Company completed the substructure, for which it was awarded a contract in the amount of $116,872 on July 2, 1965, and Canada Iron Foundries Ltd., Western Bridge Division, completed the fabrication and erection of steelwork, for which the company was awarded a contract in the amount of $384,696.40 on June 16, 1966. A temporary deck has been erected for the transportation of supplies, and the permanent deck is expected to be installed in 1968.

The Federal Government's contribution of $7,500,000 on the construction of this road was expended toward the end of September. Since that time the whole expense has been provided by the Provincial Government.

EXHIBITS

The Department has an exhibit of rock and mineral specimens in the Douglas Building, Victoria; collections are also on display in the offices of the Inspectors of Mines at Nelson, Prince Rupert, and Vancouver.

Specimens from the collection in Victoria are displayed in wall cases lining the corridor of the fourth floor of the Douglas Building. The collection includes speci-

mens of ore from many mines and prospects in the Province, and also type rocks and special minerals from British Columbia and elsewhere.

British Columbia material includes specimens collected over a period of more than 60 years by officers of the Department. Some type specimens have been purchased and other valuable specimens or groups have been donated or loaned.

ROCK AND MINERAL SETS

Information regarding sets of rocks and minerals available for sale to prospectors, schools, and individuals in British Columbia may be obtained from the Chief of the Mineralogical Branch.

PUBLICATIONS

Annual Reports of the Minister of Mines and Petroleum Resources, bulletins, and other publications of the Department, with prices charged for them, are listed in the Department of Mines and Petroleum Resources List of Publications, available from the Chief of the Mineralogical Branch or Chief of the Petroleum and Natural Gas Branch.

Publications may be obtained from the offices of the Department in Victoria and from the office of the Geological Survey of Canada in Vancouver. They are also available for reference use in the Departmental library, Room 430, Douglas Building, Victoria, in the reading-room of the office of the Geological Survey of Canada in Vancouver, and in the offices of the Inspectors of Mines in Nelson and Prince Rupert, as well as in public libraries.

MAPS SHOWING MINERAL CLAIMS, PLACER CLAIMS, AND PLACER-MINING LEASES

From the details supplied by the locators, the approximate positions of mineral claims held by record and of placer-mining leases are shown on mineral reference maps that may be inspected in the central records offices of the Department of Mines and Petroleum Resources in Victoria and Vancouver. Copies of these maps may be obtained on request made to the Chief Gold Commissioner, Victoria (price, $1.25 per print).

The boundaries of surveyed claims and leases are shown on the reference maps and other maps of the British Columbia Department of Lands, Forests, and Water Resources.

OFFICES OF THE BRITISH COLUMBIA DEPARTMENT OF MINES AND PETROLEUM RESOURCES AND THE GEOLOGICAL SURVEY OF CANADA.

The Provincial Inspectors of Mines and Resident Engineers for the Vancouver Island and Lower Mainland districts, the Silicosis Control Inspectors, and the Gold Commissioner and Mining Recorder for Vancouver Mining Division occupy offices at Room 320, 890 West Pender Street, Vancouver 1. Officers of the Geological Survey of Canada are stationed at 100 West Pender Street.

The combined services offered to the public at these two offices include technical information on mining and the geology of the Province, the identification of mineral specimens, distribution of Federal and Provincial mining and geological publications, a reference library, a display of rocks and minerals, and a central records office.

Topographic Mapping and Air Photography

The Annual Report of the British Columbia Lands Service, 1967, describes in detail the activities of the Legal Surveys, Topographic, Air, and Geographic Divisions of the Surveys and Mapping Branch.

Indexes to air photographic cover, to published maps, reference maps, and manuscript maps are available through the Director, Surveys and Mapping Branch, British Columbia Lands Service, Victoria.

Department of Energy, Mines and Resources

The Canadian Government Department of Energy, Mines and Resources performs many functions related to mining and the mineral industry in general. The Geological Survey of Canada, Mines Branch, Mineral Resources Division, Observatories Branch, and Surveys and Mapping Branch all provide services of direct interest to the mineral industry.

GEOLOGICAL SURVEY OF CANADA

The Geological Survey of Canada each year has several geological parties in the field in British Columbia.

Over a period of nearly a hundred years numerous reports and maps covering areas of the Province have been published by the Geological Survey of Canada. These publications provide geological information of great benefit to mining, exploration, and prospecting activities in the Province.

The Geological Survey of Canada maintains an office at 100 West Pender Street, Vancouver 3, with Dr. J. E. Armstrong in charge. Geological reports and maps may be obtained there.

FIELD WORK BY THE GEOLOGICAL SURVEY IN BRITISH COLUMBIA, 1967

Geological mapping and special studies were done in the following areas:—

Officers	Area	Remarks
H. Gabrielse and S. L. Blusson	104 O, 104 I, 104 J	Complete Operation Selwyn and unmapped sheets of Operation Stikine.
N. W. Rutter	Parts of 94 B, C, F, 93 H, O	Surficial geology of the Peace River dam and reservoir area.
D. T. A. Symons	93 C, D, 103 A, 104 G	Palæomagnetic studies in Dean Channel and vicinity and at Mount Edziza.
T. N. Irvine	94 C/W	Complete sampling and mapping of ultrabasic rocks in the Lay Range.
J. E. Reesor and E. Froese	82 L/1, parts of 82 L/9 and 82 K/4	Study of granitoid and metamorphic rocks of the Pinnacle Peaks area.
J. A. Fortescue, E. H. W. Hornbrook, and L. Usik	Central and southern British Columbia	Biogeochemistry — test field methods by surveys over known mineral deposits.
R. B. Campbell	93 H	Structure and stratigraphy of the Cariboo Mountains.
C. A. Giovanella	Parts of 83 D/11E, 83 D/6E, 83 D/7W, 83 D/10W	Complete study of structure and metamorphism of the gneisses straddling the Rocky Mountain Trench.
J. E. Muller	Part of 92 F	Complete Alberni map-area.
J. G. Souther	Parts of 104 G/7, G/10, G/15, G/16	Volcanology of Mount Edziza area.
F. G. Young	Parts of 93 H, A, 83 E	Structure and stratigraphy of the Cariboo and Gog Groups.
J. O. Wheeler	82 K/W	Structure and metamorphism of the Monashee Mountains.
J. W. H. Monger	Parts of 104 J, 104 N, 104 K	Structure and Permian stratigraphy of part of the Atlin Horst.
J. A. Roddick, W. W. Hutchison, and S. L. Blusson	92 M, 92 N, 92 L, 92 K, 92 J, 92 G/W, 92 F	Reconnaissance in Coast Mountains south of latitude 52 degrees north.
H. W. Tipper and J. A. Jeletzky	Northeastern part of 92 N	Mezozoic stratigraphy and structure, Mount Waddington area.
B. E. Lowes	Parts of 92 H/5 and 92 H/12	Structural study of the Cascade Mountains.
H. R. Balkwill	82 N/7W and parts of N/7E, N/2, N/10W, N/6E	Structural analyses of the western ranges of the Rocky Mountains in the Golden area.
J. E. Armstrong and S. F. Leaming	93 G	Surficial geology of the Prince George area.
R. J. Fulton	Columbia and Kootenay Valleys	Surficial geology of the reservoir area in the Columbia and Kootenay River valleys.
J. D. Aitken	Part of 82 N	Palæontology and stratigraphy of the Burgess shale.
W. H. Fritz	Eastern Cordillera in British Columbia and Alberta	Cambrian biostratigraphy in the eastern Cordillera.
R. Mulligan	104 O, 104 P	Metallogeny of the Cassiar batholith.

Publications of the Geological Survey

All current publications of the Geological Survey of Canada relating to British Columbia were added to the library of the British Columbia Department of Mines and Petroleum Resources in 1967.

MINES BRANCH

The Mines Branch has divisions concerned with mineral dressing and process metallurgy, physical metallurgy, radioactivity, and fuels. Current publications of the Mines Branch pertaining to British Columbia were added to the library of the British Columbia Department of Mines and Petroleum Resources in 1967.

MINERAL RESOURCES DIVISION

The Mineral Resources Division publishes studies on mineral resources, mineral economics, mineral legislation, mineral taxation, mining technology, and miscellaneous subjects related to the mineral industry. Current publications of the Mineral Resources Division were added to the library of the British Columbia Department of Mines and Petroleum Resources in 1967.

OBSERVATORIES BRANCH

The Observatories Branch operates a magnetic observatory at Victoria. Services available to geophysical exploration companies and other interested agencies include:—

(*a*) Three-hour range indices of magnetic activity; these provide a measure of the intensity of the magnetic disturbance (on a 0–9 scale) for each three-hour period. The monthly listings of these indices are normally mailed within a few days after the end of each month.

(*b*) Copies of magnetograms are available through a local duplicating firm at a charge of $7.50 for a monthly set. These recordings of the magnetic field can be used to control field surveys, in particular to correct for the diurnal changes and magnetic disturbances. The area over which this control is valid depends on the required accuracy; for ± 5 gamma accuracy, it covers an elliptic region reaching roughly as far as longitude 118 degrees to the east and latitude 50.5 degrees to the north.

Further details can be obtained by writing to the Officer-in-charge, Victoria Magnetic Observatory, R.R. 7, Victoria, B.C.