

EX-NO. 8 MINE, COYMOX 1913-53 (U)
A

INFO. ON THE
NO. 8 MINE,
COYMOX.
TAKEN FROM M.M.A.R.

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No. 3 East Diagonal.

This slope is driven off No. 3 East, at a distance of 500 feet from the Main slope, and is running north-east. Levels are only driven on the east side of this slope owing to there being a large fault on the west side. The levels are in good coal and are being worked by the long-wall method.

During the year the improvements at this mine consisted of the erection of the new tippie and the installation of two No. 3 Marcus screens, and picking-tables capable of handling 1,800 tons of coal a day.

The cars are dumped in a Phillips improved crossover dump, where the empty cars are returned by "link-belt" car-haulage.

The ventilation is produced by a small Murphy exhaust-fan running 140 revolutions, producing 49,500 cubic feet of air a minute with a water-gauge of $1\frac{1}{2}$ inches. A new Sirocco fan to be driven by electricity, has been ordered, with a capacity of 270,000 cubic feet a minute.

When I made my inspection in December, there was 39,500 cubic feet of air passing into this mine, divided into three splits.

No. 1 Split East.—There was 18,500 cubic feet of air a minute passing into this split for the use of fifty-four men and five mules, or an average of 268 cubic feet of air a minute for each unit employed. No explosive gas was found in this split, and the timbering and roadways were in good order.

No. 1 Split West.—There was 4,400 cubic feet of air a minute passing into this split for the use of twelve men and one mule, or an average of 293 cubic feet of air a minute for each unit employed. No explosive gas was found, and the timbering and roadways were in good order.

No. 2 Split West.—There was 15,900 cubic feet of air a minute passing into this split for the use of forty men and three mules, or an average of 288 cubic feet of air a minute for each unit employed. A little explosive gas found in the No. 1 slant and in No. 8 level: all the rest of the split was clear. The timbering and roadways were in good order.

No. 8 MINE.

T. A. Spruston, Manager.

This mine is situated about one and one-half miles east of No. 7 mine and about four and one-half miles from the town of Cumberland. This company has erected a sawmill with a capacity of 20,000 feet of lumber a day.

Two shafts are being sunk. The main shaft is 11 x 22 and the air-shaft 11 x 18. The main shaft is down a distance of 300 feet.

The plant consists of a Sullivan air-compressor with a capacity of 1,200 cubic feet free air, two return-tube boilers of 107 horse-power, and two hoisting-engines.

Twenty-five houses are nearing completion, and the railway-sidings are being excavated by a steam-shovel. In all, large sums of money are being spent to make this mine an up-to-date concern.

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

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off on the East side only, owing to a fault running parallel to the slope on the West side: these levels are in good coal ranging from 3 to 3½ feet in thickness.

This mine has been in continuous operation during the year. A new belt was installed on the 500-horse-power Rand compressor. No other additions or improvements were required at this mine.

The principal plant at this mine consists of a Sirocco fan with a capacity of 270,000 cubic feet of air a minute at a 5-inch water-gauge, driven by a 350-horse-power motor; one Rand compressor, 2,700 feet of air a minute, driven by a 500-horse-power motor; and one electric haulage-engine driven by a 750-horse-power motor.

When I made my last inspection in December I measured 108,000 cubic feet of air a minute passing into the mine, divided into four splits.

In No. 1 West split there was 15,000 cubic feet of air a minute passing for the use of thirty men and four mules, or an average of 357 cubic feet of air a minute for each unit employed.

In No. 2 West split there was 13,200 cubic feet of air a minute passing for the use of thirty-five men and four mules, or an average of 280 cubic feet of air a minute for each unit employed.

In No. 1 East split there was 23,400 cubic feet of air a minute passing for the use of thirty-eight men and three mules, or an average of 497 cubic feet of air a minute for each unit employed.

In No. 2 East split there was 14,000 cubic feet of air a minute passing for the use of forty men and three mules, or an average of 285 cubic feet of air a minute for each unit employed.

I found a small quantity of explosive gas in No. 4 gateway, off No. 5 slant, No. 9 West level; No. 4 gateway, off No. 6 slant; and No. 1 gateway, off No. 7 slant, No. 9 East level; the timbering and roadways were in fairly good condition.

Safety-lamps of the Wolf type are used exclusively in No. 7 mine; blasting is done with permitted explosives, and all shots fired by electric battery.

The total quantity of air passing into this mine in December was 108,000 cubic feet a minute, and the quantity passing into the several splits was 65,600 cubic feet a minute, making a loss in leakage of 42,000 cubic feet a minute through doors, stoppings, and old workings.

No. 8 MINE.

This mine has not been operated during the year; the plant is operated at intervals to keep same in good operating condition. Electrical heaters have been installed in the sub-station and winding-engine rooms during the year.

The following are the official returns from the Comox Collieries for the year ending December 31st, 1916:—

| SALES AND OUTPUT FOR YEAR. | COAL. | | COKE. | |
|---|---------|---------|-------|--------|
| | Tons. | Tons. | Tons. | Tons. |
| (Tons of 2,240 lb.) | | | | |
| Sold for consumption in Canada | 215,127 | | | 26,043 |
| " export to United States | 64,220 | | | |
| " " other countries | | | | |
| Total sales | | 279,347 | | |
| Lost in washing | 113,246 | | | |
| Used in making coke | 49,496 | | | |
| Used under colliery boilers, etc., and employees' use | 9,916 | | | |
| Total for colliery use | | 172,658 | | |
| | | 452,005 | | |
| Stocks on hand first of year | 7,339 | | 26 | |
| " last of year | 4,348 | | 1,587 | |
| Difference { * added to } stock during year | | +2,991 | | *1,561 |
| { + taken from } | | | | |
| Output of collieries for year | | 449,914 | | 27,604 |

No explosive gas was found on the East side; the places were well coggled and timbered and the roadways in fairly good order.

The general ventilation was good; but in No. 3 level, off No. 3 East Diagonal slope, it was very slack. The attention of the management was directed to the state of the ventilation in this section, with instructions to have it remedied as quickly as possible.

Safety-lamps of the Wolf type are used exclusively on the West side and in Nos. 7 and 9 levels on the East side, and all blasting is done with permitted explosives, and all shots fired by electric battery.

The total quantity of air passing into this mine in December was 95,760 cubic feet a minute, and the quantity passing into the several splits was 66,250 cubic feet a minute, making a loss in leakage of 29,510 cubic feet a minute through doors, stoppings, etc.

No. 8 MINE.

This mine is situated about a mile and a half east of No. 7 mine and about four miles from Cumberland.

The installation of equipment at this mine, as outlined in 1913, was completed during 1914, and was in successful operation part of the year. On account, however, of the falling-off in the coal trade, it was deemed advisable to temporarily cease operations.

The main shaft is 11 x 22 feet, and the air-shaft, which is 200 feet distant from the main shaft, is 11 x 18 inside the timbers. Two seams were opened in this mine: the Lower seam being reached at a depth of 964 feet, and the Upper seam at a depth of 764 feet.

This mine is just in its development stage, the only work being done underground consisted of three levels driven on each side of the shaft, in both Upper and Lower seams, and in a distance of 650 feet, a connection being made in both seams with the air-shaft.

During the year, to provide the ventilation for this mine, a Stine fan was installed, driven by a 35-horse-power motor, with a capacity of 90,000 cubic feet of air a minute, against a 1½-inch water-gauge. This mine was closed down on August 5th, 1914.

During the year I made fifteen trips to the Comox Collieries, travelling a distance of 2,100 miles. The following are the official returns from the Comox Colliery for the year 1914:—

| SALES AND OUTPUT FOR YEAR. | COAL. | | COKE. | |
|---|---------|---------|-------|--------|
| | Tons. | Tons. | Tons. | Tons. |
| (Tons of 2,240 lb.) | | | | |
| Sold for consumption in Canada..... | 221,686 | | 2,314 | |
| " export to United States..... | 48,219 | | | |
| " " to other countries..... | | | | |
| Total sales..... | | 269,305 | | 2,314 |
| Lost in washing..... | 103,023 | | | |
| Used under colliery boilers, etc..... | 15,685 | | | |
| Total for colliery use..... | | 118,708 | | |
| Stocks on hand first of year..... | 10,497 | | 2,314 | |
| " last of year..... | 17,125 | | None. | |
| Difference { *added to } stock during year..... | | *6,718 | | +2,314 |
| { +taken from } | | | | |
| Output of colliery for year..... | | 394,731 | | |

By-products—Fireclay, 937 tons.

1915

1918

The total quantity of air passing into this mine in December was 104,000 cubic feet of air a minute, and the quantity passing into the several splits was 43,600 cubic feet a minute, making a loss in leakage of 60,400 cubic feet a minute through doors, stoppings, and old workings.

No. 8 MINE, COMOX.

This mine has not been operated during the year. The plant is operated regularly at intervals to keep same in good operating condition.

The following are the official returns from the Comox Collieries for the year ending December 31st, 1917:—

| SALES AND OUTPUT FOR YEAR. (Tons of 2,240 lb.) | COAL. | | COKE. | |
|---|---------|---------|-------|--------|
| | Tons. | Tons. | Tons. | Tons. |
| Sold for consumption in Canada | 224,126 | | | 31,579 |
| " " export to United States | 77,668 | | | |
| " " " other countries | 27,004 | | | |
| Total sales | | 328,798 | | |
| Lost in washing | 115,090 | | | |
| Used in making coke | 53,289 | | | |
| Used under colliery boilers, etc. | 11,874 | | 117 | |
| Total for colliery use | | 180,253 | | 117 |
| Stocks on hand first of year | 3,549 | 503,051 | 2,743 | 31,676 |
| " " last of year | 2,455 | | 1,473 | |
| Difference taken from stock during year | | 1,094 | | 1,270 |
| Output of collieries for year | | 507,957 | | 30,406 |

NUMBER OF HANDS EMPLOYED, DAILY WAGES PAID, ETC.

| CHARACTER OF LABOUR. | UNDERGROUND. | | ABOVE GROUND. | | TOTALS. | |
|---|---------------|---------------------|---------------|---------------------|---------------|---------------------|
| | No. employed. | Average Daily Wage. | No. employed. | Average Daily Wage. | No. employed. | Average Daily Wage. |
| Supervision and clerical assistance | 8 | | 29 | | 37 | |
| Whites—Miners | 192 | | | | 192 | |
| Miners' helpers | | | 28 | | 255 | |
| Labourers | 227 | | 29 | | 38 | |
| Mechanics and skilled labour | 9 | | | | | |
| Boys | | | | | | |
| Japanese | 97 | | 2 | | 99 | |
| Chinese | 258 | | 102 | | 360 | |
| Indians | | | | | | |
| Totals | 791 | | 190 | | 981 | |

Name of seams or pits—Comox mines.

Description of seams, tunnels, levels, shafts, etc., and number of same—Nos. 4, 5, and 6 shafts and Nos. 4 and 7 slopes.

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The power- No. 1 is a Croc engine. No. 2 is engine, size 14 16 x 16 Robb-A boilers of 108.S-

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William Wilson

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Safety-lamp throughout the

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1936

All report-books required by the "Coal-mines Regulation Act" are kept at the mine and were regularly examined and found to conform with the regulations.

The writer is very pleased to be able to report that no fatal accidents occurred at this mine during the year. There were, however, two non-fatal accidents of a serious nature and both were caused by falls of coal at the face. There were a number of minor accidents necessitating from a few days' lay-off to a few weeks in some instances. This speaks volumes for the workmen and officials in their campaign for the reduction of accidents.

No. 8 Mine, Comox Colliery.—John S. Williams, Mine Manager. This mine was reopened in November after a shut-down of twenty-two years. There are several seams in this area which are reached by two shafts 1,000 feet in depth. At the present time the Upper (or No. 1) seam is being developed from the 700-foot level on the triple-entry system. Very little development had been done prior to the shut-down in 1914. The present plan of development is the long-wall conveyor system with walls about 300 feet long. A large shaft-pillar 1,000 feet in diameter will be left in to support the shafts, and only narrow entries will be driven through this pillar for development purposes. There was no coal production up to the end of the year, but it is expected that there will be a fairly good production early in 1937. About forty men were employed cleaning up and repairing during the twenty-four-hour period, but this number will be considerably increased in a short time.

Northfield Mine.—Arthur Newberry, Mine Manager. This mine was reopened during the year after a shut-down of forty-two years. There are several seams in this area, but the one now being developed is the famous Wellington seam. The coal is reached by two shafts 440 feet in depth. This colliery is situated close to the Island Highway, about 4 miles north of the City of Nanaimo. The first coal produced since reopening was in October, when 73 tons were sent to the surface. In November the output for the month was 997 tons and in December 1,495 tons. It is expected that the daily output will increase rapidly. A considerable amount of diamond-drilling was necessary to contact the flooded workings of the old No. 5 mine of the Wellington Colliery. This was successfully done, the water being contacted on December 13th. The water was allowed to run to the main sump of the Northfield shaft under control and was then pumped to the surface by powerful electrically driven pumps. Efforts are now being made to contact the flooded workings of the old No. 6 mine of the Wellington Colliery.

In addition to the cleaning-out and repairing of both shafts, a large amount of repair-work and rock-driving has been done underground; 3,400 feet of old roadways have been cleaned out and repaired and 1,170 feet of rock-driving done.

All surface machinery is electrically driven, power being supplied by the Nanaimo-Duncan Utilities Power and Light Company. All buildings are practically fire-proof.

Lantzville Colliery. *No. 1 Mine, Lantzville.*—Arthur Challoner, Overman. This colliery is situated on the shore of Nanoose Bay in the Strait of Georgia, about 9 miles north of the City of Nanaimo. The mine is entered by means of a slope 270 feet long and dipping landwards at an angle of 30 degrees. The Wellington seam is operated on a semi-long-wall system and is hand-mined. In this area the seam averages about 2½ feet in thickness and is of excellent quality.

The mine worked 265 days during the year and produced 8,233 tons. There are eighteen men employed underground and five on the surface and the employees operate the mine on a co-operative basis.

The ventilation was kept up to a very high standard throughout the year and no explosive gas or gas-caps were found at the time of inspections during the year. No accidents were reported during 1936.

Biggs' Mine. James Biggs, Operator. This mine is situated about 1 mile from the town of Wellington and about 7 miles north of the City of Nanaimo, and is on the site of the old original Wellington Colliery which was operated by the Dunsmuir interests many years ago. The present work consists of recovering the few remaining pillars left in by the former operators. Very little work was done during the year, however, only fifty-one days being worked and 276 tons of coal produced.

The mine is ventilated by natural means, which is quite ample for this small operation. No inflammable gas or gas-caps were found during the period of operation. The mine is very damp and there is no coal-dust hazard. No accidents were reported during 1936.

1937

air. A new diagonal slope has been driven from the half-way hoist to reach a large area of coal which lies to the left of the No. 1 West section. The seam in this area varies from 2½ to 3 feet in thickness with a fairly strong roof and will be worked by the regular long-wall system and conveyors.

An additional Canadian Ingersoll-Rand, Class P.R.B.-2, cross-compound duplex belt-driven air compressor was installed early in the year. This machine has a displacement of 936 cubic feet of air a minute at 300 r.p.m., and is driven by a 150-horse-power Westinghouse synchronous motor, 25 cycle, 3-phase, 2,200 volts, 750 r.p.m. This makes a total of six compressors located underground at a distance of 6,000 feet from the shaft.

The heavy outflow of methane from the workings in this mine demands a continual improving and enlarging of existing airways, coupled with the driving of new and more direct roadways to carry the large volumes of air necessary to dilute and render harmless the gases given off. In this connection, the management is to be congratulated on the fact that a number of the main returns from the various splits have been greatly enlarged and a new main return airway, 1,600 feet in length, 7 feet in height, and 14 feet in width, was completed and incorporated in the ventilating system on the East side of the mine in the latter part of the year. Work was also begun on a new air-drift, 8 by 16 feet, which is being driven through the rock on a pitch of 65 degrees from the Main slope section for a distance of 850 feet, where it will make connection with a new 10-by-12-foot air-shaft now being sunk from the surface to an ultimate depth of approximately 300 feet. When completed, this new opening will be used as a main intake airway for a considerable period of time and when the workings have advanced to the point where further changes are imperative, it will be equipped with a large fan and used as a main return. When the above connection is made, a big improvement should result in the general ventilating conditions as the main body of the intake air will be available at the most strategic point for distribution to the different districts. All the development-work in the Main slope area has been done by the pillar-and-stall method with a view to providing every precaution against movements in the strata in the vicinity of the air-drift.

Rock-dusting is carried on continuously in this mine, a total amount of 364,200 lb. of rock-dust were used during the year and distributed over approximately 4,000,000 square feet of surface. The dust is applied on all main roadways by means of special dust-cars built for this purpose while small boxes or troughs in conjunction with air nozzles are used in all other places. Water-sprays are constantly in use at the discharge end of all conveyors and all main partings are equipped with water-sprinklers which are used to thoroughly wet down all loaded cars before they are taken out on the main haulage. Samples of dust were collected each month from the different roadways as required and the analysis showed these to be in keeping with the standard set by the Coal-dust Regulations. Samples of air were taken regularly in the returns from all splits and main return airways, the resultant analyses providing a fund of useful information in checking on the quantities of methane given off from the faces and passing along the various returns.

Frequent inspections were made by the miners' "gas committee," and copies of all these reports of inspection were received through the courtesy of the committee members. All report-books required to be kept at the mine were examined regularly and found in good order. One fatal accident and seven serious accidents occurred in this mine during the year. The fatal accident was caused by a fall of rock, while the others occurred as follows: One due to the cage falling from the pit-head to the ground level before it was brought to a halt; three were caused by falls of coal and rock; and three by mine-cars and haulage. There were also a large number of minor accidents which caused a loss of time varying from a few days to several weeks.

No. 8 Mine, Comox Colliery.—Jas. Quinn, Manager; A. Watson, Overman. This mine is situated in the vicinity of the Lake Trail road and 2 miles east of the mine camp at Bevan. The seams are reached by two shafts each 1,000 feet in depth; these were dewatered and repaired to the 700-foot level in the latter part of 1936 after having been closed down for over twenty years. Prospecting-work only had been done when the shafts originally tapped the coal-measures and it was necessary to make new roadways and sidings to facilitate the new development in the No. 1 Seam area. A shaft-pillar 1,000 feet in diameter was marked off and narrow openings driven beyond this limit before opening out on the long-wall method

of work. Up to the present time, operations have been confined principally to the south side of the mine where the Main level has been rapidly driven ahead and No. 1 Incline turned off to the right and No. 1 Diagonal slope set off to the left. The area around the shafts for a distance of 1,200 feet is badly faulted, but the face-lines are being opened out in more regular ground; this has greatly facilitated the winning-out of the three walls in operation with another one approaching the producing stage. The No. 1 seam is approximately 30 inches thick with a band of bone and shale in the centre which varies from 6 to 26 inches in thickness; the cutting is done in this centre band by means of Anderson-Boyes overhead long-wall machines. Mecco-type conveyors are used on the walls and all machinery is operated by compressed air. The roof conditions are none of the best and require close attention on account of the numerous slips encountered together with cap-rock or false roof from 4 to 6 inches thick which usually comes down with the coal.

The ventilation is produced by a Keith fan which is capable of passing 100,000 cubic feet of air a minute, under a water-gauge of 2.5 inches. Duplicate intake and return airways are projected for each side of the mine and these will simplify the ventilating problems as the workings increase in extent. The mine drainage is taken care of by two single-stage electric pumps, one situated in each shaft at the 80-foot level, each unit delivering 150 gallons of water per minute. A new rock-drift has been driven to connect both shafts below the present pumping-station and, when this is completed, all the water will be collected at this point and then pumped up the downcast shaft by a 4-stage electric pump; all the water that accumulates below the 700-foot level is hoisted with a 600-gallon-capacity bucket up the No. 2 shaft, the water-level being kept down to a point 200 feet below the present shaft-bottom.

During the year, 74,300 lb. of rock-dust were used in treating approximately 350,000 square feet of surface. Regular sampling of the mine-air and dust was attended to in all returns and haulage roadways. The workings were inspected frequently by the miners' "gas committee" who kindly furnished copies of all reports of inspection. All report-books were examined periodically and found in accordance with the regulations.

Compressed air is supplied to the mine by a large Ingersoll-Rand compressor located on the surface. This machine is driven by a 750-horse-power motor and has a displacement of 2,100 cubic feet of air a minute. Additional buildings erected during the year were the large compressor-house, blacksmith- and machine-shop, lamp cabin, office, and store-room. Twenty-five dwelling-houses at No. 8 mine were reconditioned, and forty houses, hotel, store, and club-rooms at Bevan Camp were repaired and occupied by the employees of this mine. A number of the miners live at Cumberland and these are taken to the mine by train, which also picks up the men at Bevan when passing through the camp. At the end of December, the output had been raised to 340 tons per day with 142 men employed underground and seventeen men on the surface.

Northfield Mine.—A. Newbury, Manager; J. Sutherland, Overman. This mine operates the Wellington seam and was reopened in the latter part of 1936 after having been closed for over forty years. During the present year an enormous amount of repair-work has been carried on retimbering and enlarging roadways. The main haulage roadways on both sides of the mine have been straightened out and improved, and this programme has entailed the driving of portions of these roadways through a total distance of 3,200 feet of solid rock. No. 5 Incline is being driven in the roof-rock above the old Wellington No. 5 mine abandoned workings to develop a large area of the upper Wellington seam, which averages from 24 to 30 inches in thickness. It is anticipated this roadway will also provide a means of access to some pillars that were left in the early days of mining in this district in the vicinity of old No. 5 mine shaft. All main roads are being laid with heavy steel and are projected with a view to handling a large output.

This mine is operated on the long-wall system, the coal being cut by Anderson-Boyes machines while Mecco-type conveyors are used on the walls to transfer the coal to the loading-stations on the main levels; all of the above machinery is driven by compressed air.

The surface plant is all operated by electricity, the power being supplied by the Nanaimo-Duncan Utilities, Power, and Light Company. The main hoist at No. 1 shaft is an Ingersoll-Rand, bicylindro-conical drum, 60- and 90-inch diameters, driven by a C.G.E. 350-horse-power, 2,200-volt, 3-phase, 60-cycle a.c. motor. The ventilation is produced by a Sirocco-type fan,

Special air samples were taken on every active long-wall face in the mine with a view to ascertaining to what extent the operation of coal-cutting machines affected the outflow of methane. It was proved that the methane emission continued to increase for a considerable period after coal-cutting operations had actually ceased; the peak outflow being reached from one to three hours after cutting had been completed. The outflow of methane is also influenced by the cleaning of the cuttings from the undercut coal and by the breaking off and further fracturing of the coal in position.

Monthly inspections were made by the miners' "gas committee" and copies of all these reports of inspection were received through the courtesy of the committee members. All report-books required to be kept at the mine were examined regularly and were found to be in order.

Four serious accidents occurred in this mine during the year, two of which were due to mine cars and haulage and the other two due to falls of coal and rock. There were also 135 minor accidents, which caused a loss of time varying from a few days to several weeks. The quantity of air passing in the main return, at the bottom of the fan-drift, at the last inspection measured 155,000 cubic feet per minute; the air-sample analysis showed this air to contain 1.22 per cent. methane. The total methane outflow from this main return being 2,723,000 cubic feet during the 24-hour period.

This mine operated on 204 days during the year and produced 205,756 tons of coal, with 450 men employed underground and fifty-one men on the surface.

*No. 8 Mine, Comox Colliery.**—James A. Quinn, Manager; John S. Williams, Overman. This mine is situated in the vicinity of the Lake Trail road and 2 miles east of the mine camp at Bevan. The seams are reached by two shafts each 1,000 feet in depth; these were dewatered and repaired to the 700-foot level in the latter part of 1936 after having been closed down for over twenty years. Prospecting-work had only been done when the shafts originally tapped the coal-measures and it was necessary to make new roadways and sidings to facilitate the new development in the seam to be worked. Although it had hitherto been supposed that this seam was the No. 1 seam and, in fact, is still so named, yet it has many characteristics common to the No. 2 seam at present being worked at the Comox No. 5 mine. When further correlation data have been obtained it will be possible to definitely establish the identity of this seam. Before opening out on the long-wall advance method of work, a shaft pillar 1,000 feet in diameter was marked off and the narrow openings driven to beyond this limit.

All development-work during the year has been done on the south side of the shaft. The Main south level has been driven out 1,600 feet from the shaft. An incline off this level, starting from a point 450 feet from the shaft, has been driven 900 feet in a westerly direction. Airways have been maintained to keep pace with this development. Six long-wall faces have been developed in this seam which is approximately 33 inches thick with a band of bone and shale in the centre which ranges from a thin lens to about 10 inches in thickness; the cutting is done in this centre band by means of Anderson-Boyes long-wall machines; Hardi-ax post-type punching machines are used to cut the development places. Mecco-type conveyers are used on the walls; compressed air being used to operate the coal-cutters and conveyers. The roof conditions are not of the best and require close attention on account of the numerous slips encountered, together with cap-rock or false roof from 4 to 6 inches in thickness which usually comes down with the coal.

The ventilation is produced by a Keith fan which is capable of passing 100,000 cubic feet of air per minute under a water-gauge of 2.5 inches.

At the 116-foot level in the main shaft a rock drift has been driven from the main shaft to the air-shaft. This drift is 6 by 10 feet, 200 feet long. It is sealed on the air-shaft end and a 6-foot wall placed in the main shaft end forming a dam or sump. The surface water from both shafts is collected in rings in the shafts and piped into this sump. From this sump the water is pumped to the surface by a 5-inch single-stage centrifugal pump driven by a 50-horse-power 2,200-volt 3-phase motor and having a capacity of 700 gallons per minute. This unit is fully duplicated for use in case of emergency. Both pumps are set below the sump-level and are automatically primed. The discharge is also controlled by a float in the dam connected to a valve on the discharge-line, this controlling the discharge and preventing

* By E. R. Hughes.

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the pump from running out of water. The amount of surface water thus collected and pumped out of the mine varies from about 300 gallons per minute in the summer to 600 gallons per minute in the winter. All the water that accumulates below the 700-foot level is hoisted with a 600-gallon-capacity bucket up the No. 2 shaft, the water-level being kept down to a point 200 feet below the present shaft-bottom.

During the year 170,000 lb. of rock-dust were used in treating the roadways and face-lines of the mine; 65,000 lb. of this being used to treat 6,500 feet length of roadway and 195,000 lb. being used to treat the face-lines; 600 feet of face-line being treated daily for 176 days. As an additional precaution against the coal-dust hazard, water sprays were installed at the discharge end of the conveyers. One hundred and twelve samples of mine-dust were analysed during the year, all of which exceeded the minimum standard as set by the dust regulations. Thirty-two samples of mine-air were collected during the year and sent to the Bureau of Mines, Ottawa, for analyses. The last mine-air sample taken in the Main return—during December—showed the air to contain 0.54 per cent. methane, the quantity of air passing at this time being 103,000 cubic feet per minute, this being for the use of sixty-four men and five horses. At the time of the December inspection the output was 320 tons per day with 114 men employed underground and fifteen men on the surface. The workmen were inspected frequently by the miners' "gas committee" who kindly furnished copies of all reports of inspection. All report-books were examined periodically and found to be in accordance with the regulations.

Two serious accidents occurred in this mine during the year, both of which were the results of falls of rock. In addition to the above there were fifty-seven minor accidents in and around the mine, involving a loss of time varying from a few days to a few weeks.

Compressed air is supplied to the mine by a large Ingersoll-Rand compressor located on the surface. This machine is driven by a 750-horse-power motor and has a displacement of 2,100 cubic feet of air per minute. The only addition to surface equipment during the year was in the nature of fire-protection. The water from the underground pumps is discharged into a large tank on the surface. From this source a 4-stage, 5-inch centrifugal pump is coupled. This water is pumped to one 4-inch hydrant in the middle of the yard, one 2-inch hydrant on the picking-table, and one 2-inch hydrant on the top landing. This pump develops approximately 100 lb. pressure per square inch; 500 feet of 2-inch hose is on hand to be used when required.

After working irregularly for several weeks this mine closed down on December 12th for an indefinite period; however, the manager and the overman, also the main shaft hoistmen have been retained for the purpose of repairs and pumping.

Northfield Mine.—A. Newbury, Manager; J. Sutherland, Overman. This mine is situated about 4 miles north of Nanaimo and has railway connections over the Esquimalt & Nanaimo Railway and the Western Fuel Corporation's private lines with the loading-wharves at Nanaimo where the coal is shipped to the various markets. A general description of the surface plant and method of working in force at this mine appeared in the 1937 Annual Report of the Minister of Mines. An important addition to the underground equipment was the installation of a new hoist to cope with the increased output from the main slope. This is a product of the Ottumwa Iron Works and consists of a single-keyed drum, 54 inches in diameter, 42-inch face, with 72-inch-diameter flanges, equipped with a post-type brake operating on a 72-inch diameter, 11-inch face brake-ring. The motive power is provided by a General Electric 150-horse-power, 2,200-volt, 3-phase, 60-cycle, 435-r.p.m. slip-ring motor. The controls are also General Electric and consist of a 2,200-volt primary reversing panel and a secondary accelerating panel. The hoist-room is located 75 feet from the shaft and fully fire-proof throughout, being built of reinforced concrete with steel girders for roof supports. The controls are installed in a separate room, also built of concrete.

This mine is operating in the Wellington seam and was reopened in the latter part of 1936 after having been closed for over forty years. During the present year it worked 205 days with an average daily production of 574 tons, all of which being produced from long-wall faces where the coal is undercut by Anderson-Boyes coal-cutting machines, then loaded on to Meco conveyers which transport the coal along the various face-lines to the loading-points on the haulage. No. 5 Incline has been extended a distance of 1,400 feet, being driven in the strata above the seam, and will ultimately make connection with the old Wellington

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two men engaged. General working conditions have been found fairly satisfactory in the course of inspection. No accidents were reported from this mine during the year.

No. 5 Mine, Cassidy. J. McKellar and associates, Operators; L. Dickie, Fireboss. This mine, in the Cassidy district, is in a portion of the Douglas seam lying to the south of the abandoned Granby No. 2 mine. Production in 1946 amounted to 672 long tons during a working period of 124 days, with a crew of four men engaged. This mine was closed down from May to September, inclusive, as a result of decreased demand for coal on the local market. General conditions have been found satisfactory in the course of inspection. No accidents were reported from this mine during the year.

(49° 124° S.E.) **Loudon's No. 5 Mine, Wellington.** W. Loudon and associates, Operators; W. Loudon, Fireboss. This mine, on the opposite side of the ridge from the old No. 9 mine in the Wellington district, is in the upper Wellington seam. Production in 1946 amounted to 1,422 long tons over a working period of 233 days, with a crew of four men engaged. General working conditions have usually been found satisfactory in the course of inspection. No accidents were reported from this mine during the year.

(49° 124° S.E.) **Carruthers and Wakelam No. 3 Mine, Wellington.** R. B. Carruthers and W. Wakelam, Operators; R. B. Carruthers, Fireboss. This mine is near the Loudon mine and also in the upper Wellington seam. During the early part of the year the main level holed through into the old No. 9 mine, thus providing a good airway and also a good connection with the Loudon mine. Production in 1946 amounted to 805 long tons over a working period of 257 days, with a crew of two men engaged. As a rule working conditions have been found generally satisfactory in the course of inspection. No accidents were reported from this mine during the year.

(49° 124° S.E.) **Pacific No. 2 Mine, Wellington.** F. John and H. Gerloch, Operators; F. John, Overman. This small mine, in Wellington district, was operated in a few very small outcrop pillars left in this area when the old Wellington slope was abandoned. All available coal that could be mined with safety was recovered, and this mine permanently abandoned in the early part of December. Production in 1946 amounted to 379 long tons over a working period of 243 days, with a crew of two men engaged. Working conditions were found fairly satisfactory during inspections. No accidents were reported during the year.

(49° 124° S.E.) **Stronach No. 2 Mine, Wellington.** C. Stronach, Operator; H. Gilmuir, Fireboss. This mine is operated in a section of the upper Wellington seam adjacent to old No. 9 mine, to which connection has been made by three levels driven off to the right of the Stronach main slope. Production in 1946 amounted to 1,589 long tons over a working period of 231 days, with a crew of six men engaged. General conditions have been found fairly satisfactory in the course of inspection. No accidents were reported from this mine during the year.

COMOX.

By John MacDonald.

Canadian Collieries (Dunsmuir), Ltd. *No. 8 Mine, Comox Colliery, Cumberland.*—(49° 125° S.W.) J. S. Williams, Manager; A. W. Watson, Overman; D. Morgan and W. Johnstone, Shiftbosses; W. Bennie, F. Coates, A. Dean, M. Frame, A. Maxwell, J. Queen, P. Queen, T. Shields, J. W. Smith, D. Waddington, S. Hunt, J. Weir, and T. Robertson, Firebosses. This mine is close to the Lake Trail road and about 2 miles east of the mine camp at Bevan. The seams in this area are reached by two shafts, each 1,000 feet in depth, but the upper, or No. 2,

seam, which lies at a depth of 700 feet, is the only one where operations have been carried on to any extent to date. A new rock slope, 870 feet in length, has been driven during the year. At the end of December this reached the lower, or No. 4, seam, but development-work in this district will be delayed pending the driving of a return airway to make connection with existing roadways already driven from the foot of the upcast shaft. A general description of the surface plant and general method of working has appeared in previous Annual Reports, and no change has been made during 1946. Six long-walls, each with an average length of 300 feet and a seam thickness varying from 24 to 36 inches, were in operation at the end of December. Production in 1946 amounted to 139,689 long tons over a working period of 258 days, with an average crew of 230 men employed underground and 35 on the surface.

General conditions have been found fairly satisfactory during the course of inspection, excepting on infrequent occasions when an abnormal outflow of methane necessitated the prohibition of blasting operations pending the effective removal of all visible gas-caps from the general body of the air in the particular places affected. At the last inspection in December the fan was producing a total quantity of 240,000 cubic feet of air a minute, under a water-gauge of 6.6 inches, for the use of 225 men and 5 horses engaged in the full three shifts of twenty-four hours. Thirty-three samples of air were collected in the main returns, the methane content of these varying from 0.29 per cent. in the north side return to 0.59 per cent. in the No. 1 main south return. Two hundred and sixteen samples of dust were gathered from the various roadways, all of which were above the minimum standard of incombustible content as set by the Coal-dust Regulations. A total of 127 tons of limestone-dust was used to combat the coal-dust hazard on roadways and face-lines and for tamping purposes in blasting operations. Searches were made frequently for matches, etc., but no articles of a prohibited nature were found. One hundred and forty-six accidents were reported and investigated, all of these being classed as of a minor nature, although some involved the loss of a considerable amount of working-time.

No. 5 Mine, Comox Colliery, Cumberland.—(49° 125° S.E.) S. Lawrence, Manager; J. Christie, Overman; T. Eccleston and A. Somerville, Shiftbosses; J. Cochrane, R. O'Brien, L. Cooper, M. Brown, A. Jones, F. Dixon, J. Vaughan, M. Frobisher, and L. Hutcheson, Firebosses. This mine is approximately 1½ miles from Cumberland and is entirely in the No. 2 seam, which is reached by a shaft 280 feet in depth. Three walls operated during the year had an average length of 280 feet with a seam thickness of 40 inches. A general description of the surface plant and method of working has appeared in previous Annual Reports, the only change made in 1946 being the installation of a first-aid room in a part of the general warehouse building.

Development-work included 300 feet of drivage in the Main slope proper, 200 feet in No. 1 West slope, and the reopening of a portion of the old No. 5 East district, where a long-wall face was opened up in a large pillar left in the first workings. During the latter part of the year the No. 6 East section was unwatered for further examination. Development-work is being considered for this area in the near future. Working conditions in general have been found fairly satisfactory during the course of inspection, and ventilating conditions have been fairly satisfactory throughout the mine. A considerable amount of repair-work has been carried out on the right side return airway in the Main Slope district, and a new airway has been driven to serve the left side workings off the slope. At the last inspection for the year the two fans were producing a total quantity of 166,000 cubic feet of air a minute for the use of 123 men engaged in the full three-shift period of twenty-four hours. Nineteen samples of air were collected in the main returns, the methane content of these varying from 0.01 per cent. in No. 1 fan return airway to 0.92 per cent. in the main East return.

Old No. 8 Mine, Timberlands. J. R. Wilson and G. Lewis, operators; J. R. Wilson, fireboss. This mine is operating in the Wellington seam, in a small section of outcrop that was left when the Wellington mine was abandoned by Canadian Collieries (Dunsmuir), Limited. Production in 1947 amounted to 749 long tons over a working period of 254 days, with a crew of two men engaged. General working conditions have been found fairly satisfactory in the course of inspection. No accidents were reported during the year.

(49° 124° S.E.) **Loudon's No. 5 Mine, Wellington.** W. Loudon and associates, operators; W. Loudon, fireboss. This mine is on the opposite side of the ridge from the old No. 9 mine in the Wellington district, and operates in the upper Wellington seam. The Main level is connected to the No. 9 mine abandoned workings and a good current of natural ventilation is generally available either to or from No. 9 slope, depending on outside temperatures as to its direction of travel. Production in 1947 amounted to 1,073 long tons over a working period of 211 days, with a crew of four men engaged. General working conditions have always been found satisfactory in the course of inspection. No accidents were reported during the year.

(49° 124° S.E.) **Carruthers and Wakelam No. 3 Mine, Wellington.** R. B. Carruthers and W. Wakelam, operators; R. B. Carruthers, fireboss. This mine is in the immediate vicinity of the Loudon mine and also operates in the upper Wellington seam adjacent to the old No. 9 mine abandoned workings. Production in 1947 amounted to 681 long tons over a working period of 228 days, with a crew of two men engaged. Working conditions have usually been found satisfactory in the course of inspection. No accidents were reported during the year.

(49° 124° S.E.) **Pacific No. 3 Mine, Wellington.** F. John and D. Caldwell, operators; F. John, overman. This was a new prospect slope in the same area as the Loudon mine. Sinking operations were carried on from January to April, inclusive, when the slope was permanently abandoned because of drainage difficulties. No coal was produced during the period. Two men were engaged.

(49° 124° S.E.) **Stronach No. 2 Mine, Wellington.** C. Stronach, operator; H. Gilmour, fireboss. This mine is in a section of the upper Wellington seam adjoining the old No. 9 mine, to which it is connected by several levels driven off from the right of the Main slope. Production in 1947 amounted to 1,664 long tons over a working period of 208 days, with a crew of six men engaged. General working conditions have usually been found satisfactory during the course of inspection. No accidents were reported during the year.

COMOX.

By John MacDonald.

Canadian Collieries (Dunsmuir), Ltd. *No. 8 Mine, Comox Colliery, Cumberland.*—(49° 124° N.W.) J. S. Williams, manager; A. W. Watson, overman; D. Morgan and W. Johnstone, shiftbosses; W. Bennie, A. Dean, F. Coates, J. Queen, P. Queen, J. W. Smith, J. Weir, M. Brown, T. Robertson, A. Maxwell, D. Waddington, T. Shields, J. Vaughan, R. O'Brien, A. Jones, L. Cooper, and J. Cochrane, firebosses. This mine is close to the Lake Trail road and about 2 miles east of the mine camp at Bevan. The seams in this area are reached by two shafts, each 1,000 feet in depth, but to date all production has come from the upper, or No. 2, seam. In the new rock slope section, where the lower, or No. 4, seam was reached at the end of December, 1946, a second outlet was driven back a distance of 900 feet to connect with the original No. 4 seam workings near the foot of the air-shaft. Two levels are now being driven in a southerly direction to prove up the seam, but these were still in faulted ground at the end of the year.

A general description of the surface plant and method of working has appeared in previous Annual Reports, and no material changes have been made during 1947, with the exception of an addition to the wash-house to accommodate an additional 100 men and the erection of a new blacksmith-shop in a more convenient location in the mine yard. Nine long-walls, each with an average length of 300 feet and a seam-thickness varying from 36 to 42 inches, were in operation during the year. Production in 1947 amounted to 166,506 long tons over a working period of 249 days, with an average of 325 men employed underground and 28 on the surface.

General conditions have been found fairly satisfactory during the course of inspection, excepting on several occasions where heavy roof-movements were responsible for an abnormal outflow of gas in certain places. Under such circumstances, all blasting was immediately prohibited pending the effective removal of all visible gas-caps from the general body of the air. At the last inspection in December the fan was producing a total quantity of 236,000 cubic feet of air a minute, under a water-gauge of 6.6 inches, for the use of 330 men and 7 horses engaged in the full three shifts of twenty-four hours. Thirty-two samples of air were collected in the main returns, the methane content of these varying from 0.38 per cent. in the North side return to 0.70 in the No. 2 main South return. Two hundred and sixteen samples of dust were gathered from the various roadways; all the samples were above the minimum standard of incombustible content as set by the Coal-dust Regulations. One hundred and thirty-two tons of limestone-dust was used to combat the coal-dust hazard on roadways and face-lines, and for tamping purposes in blasting operations. Searches were made frequently for matches, etc., but no articles of a prohibited nature were found. One hundred and sixty accidents were reported and investigated. Five of these were serious, while the others were classed as minor.

No. 5 Mine, Comox Colliery, Cumberland.—(49° 125° S.E.) S. Lawrence, manager; J. Christie, overman; T. Eccleston and A. Somerville, shiftbosses; R. O'Brien, J. Vaughan, A. Jones, C. Williams, L. Hutchinson, M. Brown, J. Cochrane, F. Dixon, L. Cooper, and M. Frobisher, firebosses. This mine is approximately 1½ miles from Cumberland and has been operated entirely in the No. 2 seam for the past few years. Three long-wall faces were in operation until the end of March, at which time the right side wall off the Main slope had to be abandoned on account of broken ground. In the month of April a decision was reached to close this mine, as it was found economically impossible to operate the remaining small area of coal available in view of the excessively long haulage involved. Active production ceased on April 11th, the mine being permanently abandoned as at July 3rd, at which date all material had been withdrawn. It is interesting to mention that the sinking of No. 5 shaft was begun in 1894 and completed in 1895 to the No. 4 seam, a total depth of 590 feet. Three seams were operated at various times during the life of this mine. The No. 1 seam was opened up in 1898 and abandoned in 1924, while the No. 4 seam workings were abandoned in 1906. In 1923 a rock tunnel was driven across the measures from the No. 1 seam to the No. 2 seam, but production from this seam did not begin until 1927. During its life this mine was temporarily closed down for various periods, totalling approximately six years of inactivity.

General working conditions were found fairly satisfactory in the course of inspection, considering the length of haulage roadways that required almost constant repairs. At the last inspection in April a total quantity of 174,000 cubic feet of air a minute was passing in the main returns for the use of 200 men in the full three-shift period of twenty-four hours. From January to April, inclusive, production amounted to 24,528 long tons over a working period of 71 days, with an average of 200 men employed underground and 25 on the surface. Eight samples of air were collected in the main returns, the methane content of these varying from 0.09 per cent. in No. 1

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Stronach No. 2 Mine. C. Stronach, operator; H. Gilmour, fireboss. This mine also is in a section of the upper Wellington seam adjacent to the old No. 9 mine. While some development work has been done during the year, most of the output has come from pillar extraction, beginning at the old No. 9 faceline and working back in the direction of the main slope. Production in 1949 amounted to 1,772 short tons over a working period of 218 days with crew averaging six men. Working conditions in general were found satisfactory during the course of inspection. No accidents were reported during the year.

Stronach No. 3 Mine. This mine, near the Stronach No. 2 mine, was operated for a few months. A slope was driven from the surface, with the intention of recovering coal thought to have been left in pillars in the old Wellington lower-seam workings. However, the results were disappointing, and work was discontinued in the latter part of the year. Production in 1949 amounted to 95 short tons over a working period of forty-three days. Working conditions were found fairly satisfactory during the course of inspection. No accidents were reported during the year.

COMOX (49° 124° N.W.).

Canadian Collieries (Dunsmuir), Limited. *No. 8 Mine, Comox Colliery, Cumberland.*—J. S. Williams, manager; A. W. Watson, overman; D. Morgan and J. Weir, shiftbosses; T. Robertson, A. Dean, A. Maxwell, J. W. Smith, D. Waddington, T. Shields, A. Jones, L. Cooper, J. Vaughan, F. Coates, C. Williams, P. Queen, J. Queen, J. Clarkson, T. Wynne, J. Knowles, and J. Christie, firebosses. This mine is close to the Lake Trail road and is approximately 2 miles east of the mine camp at Bevan. The seams in this area are reached by two shafts each 1,000 feet deep, but the whole of the output has come from the upper, or No. 2, seam. All operations have been indefinitely suspended in the lower, or No. 4 seam as a result of faulted ground in this area. Eight longwalls, each with an average length of 300 feet and a seam thickness ranging from 36 to 42 inches, were operated during the year. Production in 1949 amounted to 208,114 short tons over a working period of 224.5 days with a crew averaging 350 men employed underground and 30 on the surface.

Two Goodman duckbills are operated steadily on developing new walls and driving airways. To increase efficiency in general, the management decided to reduce from 300 feet to 250 feet the length of the new walls now being opened so that the full cycle of cutting, panning, and loading will be completed every twenty-four hours. This system will also provide the safest possible working conditions on the walls as the men will be working a fairly good roof, whereas, in the past, delays in cleaning off the cut have resulted in the roof breaking badly along the facelines. A Joy loader was purchased and put into operation on development in No. 2 slope and has given very satisfactory results. On No. 5 Right wall, off No. 2 slope, a Huwood bottom-belt conveyer was installed. This discharges on to a main Huwood trough-belt conveyer on No. 5 Right level; both of these units have proved very satisfactory and are a decided improvement over the shaker-conveyer, especially on the actual faceline where the elimination of the noise of the shaker-conveyer gives the men a better opportunity to detect roof movements. On all other walls, shaker-conveyers of the Mecro type are used to transport the coal along the facelines to the main loading-points on the various levels.

Except for occasions when abnormal emissions of gas were encountered on the North side walls, working conditions in general have been found fairly satisfactory in the course of inspection. Under the above conditions, blasting was always suspended pending the effective removal of all visible gas-caps from the general body of the air. To provide the best possible ventilation, a number of new airways have been driven and existing airways have been repaired and enlarged. At the last inspection in December, air measurements showed a total quantity of 199,500 cubic feet a minute passing in

the main return for the use of 350 men in the full three-shift period of twenty-four hours. Twenty-seven samples of air were taken in the main returns, the methane content of these varying from 0.42 per cent. in the North side return to 1.18 per cent. in the No. 1 Main South return. One hundred and ninety-eight samples of dust were gathered from the various roadways. All of these samples were above the minimum standard of incombustible content as set by the Coal-dust Regulations. A total of 272,000 pounds of limestone dust was used during the year, 181,600 pounds being used in treating roadways and the remainder in blasting operations. Frequent searches were made for matches and other prohibited articles, but none were found. Two hundred and two accidents were reported and investigated. Three of these were serious, while the remainder were classed as minor. No fatal accidents occurred during the year. One dangerous occurrence was reported and investigated fully. This occurred at the main pumping station adjacent to the shaft bottom when one of the motors overheated and caught fire.

Tsable River Mine.—S. Lawrence, manager; T. Eccleston, A. Somerville, M. Brown, M. Frobisher, A. Cullane, L. Hutchinson, and W. Herd, firebosses. This mine is in the Tsable River area, approximately 5 miles west of Buckley Bay on the Island Highway. On May 1st the temporary plant used for the original prospect slope was abandoned and the new permanent plant put into operation. This consists of a tippie with single-car rotary dump discharging into a 500-ton capacity bunker, which is equipped with a scraper chain for spreading the coal in the bunker. The main slope hoist is behind the tippie. It is a single-drum hoist, driven by a 500-horsepower 250 r.p.m. 2,200-volt liquid-rheostat-controlled motor. The power is transmitted through a steel rope-laced flexible coupling to the pinion shaft. The gear ratio is 29:115 through a herringbone pinion and gear. The drum barrel is 6 feet 3 inches in diameter by 3 feet 6½ inches between flanges and when full will hold 8,000 feet of 1½-inch rope. At present 4,500 feet of rope is in use. The hoist is equipped with a Lilly controller and a "dead man" control. The Lilly controller prevents overspeeding and overwinding of the trip while hoisting men and material. The "dead man" control is an added feature which protects the man-trip by automatically bringing it to rest should anything happen to the hoistman. The main slope trip is composed of ten 1½-ton cars using a suitable drag when hoisting material but equipped with an approved safety car on all man-trips. Underground power is supplied by a Canadian Ingersoll-Rand compressor direct-driven by a 500-horsepower motor and having a capacity of 3,300 cubic feet of air. Provision has been made for an additional unit when required. The original compressor plant is still intact and consists of the following units: One Canadian Ingersoll-Rand compressor, belt-driven by a 150-horsepower motor and having a capacity of 950 cubic feet; one Canadian Ingersoll-Rand compressor with a capacity of 660 cubic feet, belt-driven by a 150-horsepower motor; and one Gardner-Denver compressor, belt-driven by a 150-horsepower motor and having a capacity of 750 cubic feet. Fresh water is supplied by a 5-inch 5-stage centrifugal pump located at the river bank. The pump has a capacity of 350 gallons per minute and discharges into a 20,000-gallon storage tank. The mine is ventilated by a 40-inch diameter Keith-type fan capable of delivering 40,000 cubic feet of air a minute against a water-gauge of 2 inches. The wash-house, with accommodation for 200 men, lamp-cabin, and fully approved first-aid room are all housed in one building. The mine office building houses the manager and timekeeper's office, storeroom, and office for the firebosses. A main powder magazine has been built in compliance with the regulations, and a smaller building is at a convenient location for the storage of the daily supply of explosives from which the men receive their powder issue before going on shift. A well-equipped blacksmith and car-repair shop is housed in one building convenient to the main slope portal. Fire protection is provided by fire hydrants and hoses at all strategic points, and all buildings are equipped with approved fire-extinguishers. A qualified industrial first-aid

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worked consists of virgin coal in a seam which lies from 50 to 60 feet stratigraphically above the Douglas seam. The seam dips at approximately 20 degrees in a southerly direction, and averages 7 feet in thickness, including two rock bands. The upper band of rock is 6 inches thick, and the lower one is up to 1½ feet thick. The roof of the seam is a strong conglomerate.

The coal is mined by blasting it off the solid, and a Huwood compressed-air-operated rotary drill is used to drill the shot-holes. The coal is hand-loaded into cars which are hauled to the surface by a small gasoline-driven hoist. A total of 800 feet of drivage was done during 1950; the mine now comprises a main slope 250 feet long dipping 16 degrees southwest with three levels driven off on each side of the slope at approximately 50-foot centres, the longest of these now being 150 feet. A counter to the main slope connects with an air-shaft, 20 feet deep, from the surface. Natural ventilation is supplemented when necessary by a small fan at the top of the air-shaft, operated by a 3-horsepower Fairbanks gasoline motor.

Production during 1950 amounted to 1,750 short tons over a working period of 221 days with a crew averaging five men. General working conditions were found satisfactory in the course of inspections, and no accidents were reported during the year.

**No. 8 Mine,
Timberlands**

J. R. Wilson and G. Lewis, operators; J. R. Wilson, fireboss. This mine is operating in the Wellington seam in a small area of outcrop coal that was left when the No. 8 mine was abandoned by Canadian Collieries (Dunsmuir) Limited. Production in 1950 amounted to 668 short tons over a working period of 189 days with a crew of two men. Working conditions were found generally satisfactory in the course of inspections. No accidents were reported during the year.

NORTH WELLINGTON (49° 124° S.E.)

**Loudon's No. 5
Mine**

W. Loudon and associates, operators; W. Loudon, fireboss. This mine is on the opposite side of the ridge from the old No. 9 mine in the Wellington district and is operating in a small area of coal near the outcrop in the upper Wellington seam. Production in 1950 amounted to 965 short tons over a working period of 203 days with a crew averaging four men. Working conditions were usually found satisfactory during the course of inspections. No accidents were reported during the year.

**Carruthers and
Wakelam No. 3
Mine**

R. B. Carruthers and W. Wakelam, operators; R. B. Carruthers, fireboss. This mine is in the immediate vicinity of the Loudon mine and is also in the upper Wellington seam adjacent to the old No. 9 mine abandoned workings. Production in 1950 amounted to 615 tons over a working period of 191 days with a crew of two men. Working conditions were found satisfactory in the course of inspections. No accidents were reported during the year.

**Stronach No. 2
Mine**

C. Stronach, operator; H. Gilmour, fireboss. This mine is in a section of the upper Wellington seam adjacent to the old No. 9 mine. Most of the output during 1950 has come from pillar extraction. Production amounted to 2,025 short tons over a working period of 213 days with a crew averaging six men. Working conditions were usually found satisfactory in the course of inspections. No accidents were reported during the year.

COMOX (49° 124° N.W.)

**Canadian Collieries
(Dunsmuir) Limited**

No. 8 Mine, Comox Colliery, Cumberland.—J. S. Williams, manager; J. Weir, acting overman; L. Cooper and J. W. Smith, shiftbosses; T. Robertson, A. Dean, A. Maxwell, D. Waddington, T. Shields, A. Jones, J. Vaughan, F. Coates, C. Williams, P. Queen.

J. Queen, J. Clarkson, T. Wynne, J. Knowles, and J. Christie, firebosses. This mine is close to the Lake Trail Road, 2½ miles from Courtenay and 2 miles east of the mine camp at Bevan. During the latter part of the year No. 8 mine became the leading coal-producing mine on Vancouver Island, with an average daily output of 975 tons. The whole of the output was obtained from the No. 2 seam, whose average thickness is 3 feet 9 inches, including rock bands, and which lies at a depth of 700 feet from the surface at the shafts. The seam pitches at a gradient of 6 degrees in a northeasterly direction. It is reached by two shafts, each 1,000 feet deep, which penetrate to the lower or No. 1 seam, where operations are at present suspended due to heavily faulted ground. The mine is worked entirely by the longwall system. In December eight longwall faces were in operation, four being 300 feet long, two 250 feet long, and two 225 feet long. Production in 1950 amounted to 213,610 tons over a working period of 223 days with a crew of 320 men employed underground and 27 on the surface.

During 1950 the management has continued the policy initiated in 1949 of installing belt-conveyors for both face and roadway conveying. Four new Huwood 26-inch bottom-belt-loading-type face conveyors were installed on Nos. 1 and 2 Left walls off No. 3 Right level, together with two Huwood 30-inch troughed-belt roadway conveyors. On November 20th a Huwood 30-inch troughed-belt conveyor was put into operation on No. 3 Right level as a trunk conveyor. The two roadway conveyors deliver coal on to this trunk conveyor, which in turn delivers the coal into cars at a central loading point near the top of the North incline. These improvements mark a step forward toward greater efficiency in production and greater safety as a result of freedom from noise on the coal face and from haulage accident hazards on the roadways. Additional precautions, however, are called for in dealing with dust, the fire hazard, and the adequate fencing of conveyor machinery.

In addition to these four new belt-conveyor installations, another Huwood face and roadway conveyor has been in use throughout the year on No. 5 Right wall and level on the south side of the mine. On April 4th a Huwood longwall loading-machine was put into operation on this wall but was removed on August 17th, as the results under those particular conditions were not satisfactory as compared with hand-loading on to conveyors. On the remainder of the longwall faces, Meco shaker-conveyors are still in use. The coal is loaded directly into cars at the road-heads and hauled outby to the main inclines by small hoists. Throughout the mine the coal is cut to a depth of 5 feet 8 inches at a height of 17 inches above floor level by Anderson Boyes longwall coal-cutting machines.

An additional Mavor & Coulson Joy loader was acquired during the year, and this, together with another Joy loader and two Goodman duckbill units, has been employed on development work. A total length of 1,100 feet of longwall face has been developed during the year.

Working conditions were generally fairly satisfactory, except for occasions when small emissions of gas were encountered. Under the latter conditions, blasting was always suspended pending the removal of all visible gas-caps from the general body of the air. The state of the main airways of the mine was found satisfactory. At the last inspection in December, air measurements showed a total of 154,000 cubic feet per minute passing in the main returns for the use of 320 men in the full three-shift period of twenty-four hours. An air sample taken in December at the upcast shaft bottom indicated 0.72 per cent of methane in the general body of the return air. Two hundred and eighteen samples of dust were taken from the various roadways during the year; all the samples showed a higher incombustible content than the minimum set by the Coal-dust Regulations. One hundred and fifty-eight tons of limestone dust was used during the year; 106 tons was used for treating roadways, and the remainder was used on the faces and for tamping shots. Water sprays are employed on the belt-conveyor systems and at other points for keeping down air-borne dust.

First-aid arrangements have been maintained at a satisfactory standard, and twenty-one employees are qualified to render first aid to the injured. A well-equipped first-aid room is available on the surface. One mine-rescue team of six men has kept up regular monthly practices at the Cumberland Mine-rescue Station.

One hundred and sixty-two accidents were reported and investigated, a decrease of 20 per cent from the total for 1949. One of these was fatal, three were serious, and the remainder were classed as minor. Two dangerous occurrences were reported, both of which were investigated fully. The incidents occurred in April and June and took place on No. 1 Left wall off No. 3 Right level on the north side of the mine. Both involved small ignitions of methane at the back of the cut immediately following the firing of a shot in the coal. After full investigation, various remedial measures were put into force.

Tsable River Mine.—S. J. Lawrence, manager; T. Eccleston, A. Somerville, M. Brown, A. Cullen, L. Hutchinson, M. Frobisher, and W. Herd, firebosses. The mine is in the Tsable River area, approximately 5 miles west of Buckley Bay. It operates in the upper or westerly portion of the Tsable River coalfield, being separated from the lower or easterly part by a buried ridge of volcanic rocks projecting up into the coal measures. Both these parts of the Tsable River field are separated from the Cumberland coalfield by a large "want," the seams having been eroded, and coarser sediments deposited in their place. The seam section being worked is 8 feet thick and contains several bands of shale of varying thickness. Its pitch averages 9 degrees in a northwesterly direction.

As developed at present, the mine broadly comprises a main slope and three counter slopes driven on the dip of the seam for 2,880 feet from the portals, and a series of pairs of levels driven off to the right and left from the main slope at approximately 450-foot intervals. The method of working is a modified form of room and pillar.

Early in 1950 the main slope was advanced 60 feet and encountered a 20-foot upthrow thrust fault. In May the existing workings to the west of the main slope were discontinued due to an increasing thickness of rock bands in the seam section. Work was then concentrated on the east side of the mine and on prospecting and developing the area beyond the fault at the bottom end of the main slope. In June the driving of the left (west) counter slope through the fault was started, and by December 600 feet had been driven. The right counter slope was also driven for 300 feet beyond the fault, and the two roadways connected by a crosscut. The seam beyond the fault has proved to be 10 feet thick, with four shale bands totalling about 2 feet in thickness.

Total development work done during the year has amounted to 9,185 feet of drivage, which includes the main slope and counter slope, levels, counter levels, and crosscuts. In most cases the coal is conveyed from the faces by shaker-conveyors to a convenient loading point on one of the levels, where it is loaded into cars. Four Goodman duckbill units are used, and four Anderson-Boyes shortwall coal-cutting machines. Where conditions are unfavourable for undercutting the coal by machine, it is blasted off the solid. Twelve Climax compressed-air-operated rotary drills are used for drilling shot-holes.

At the end of April extraction of the coal pillars, between Nos. 1 and 2 Right levels on the east side of the mine, was commenced. An effort was made to obtain maximum recovery of coal, and a longwall coal-cutting machine was utilized to assist in this work. By the end of the year the operation was completed, and it is estimated that 85 per cent of the available coal was extracted.

Total production for the mine for 1950 amounted to 97,146 tons over a working period of 223 days with a crew of 110 men employed underground and 15 on the surface.

The ventilation has generally been found satisfactory. It was further improved at the beginning of August by the installation of a larger fan at the mouth of the old prospect slope. This fan is a 50-inch-diameter Keith-type fan, and an air measurement taken in the fan drift in December showed that it was circulating 44,000 cubic feet of air per minute against a 3-inch water-gauge. The previous fan is being retained as a stand-by.

1951

Stronach No. 2 Mine

C. Stronach, operator; H. Gilmour, fireboss. This mine is in a section of the No. 2 or Upper Wellington seam adjacent to the old No. 9 mine. Most of the output during 1951 has come from pillar extraction. Production amounted to 1,806 tons over a working period of 228 days with a crew of seven men. Working conditions were usually found satisfactory in the course of inspections, and no accidents were reported.

COMOX (49° 124° N.W.)

Canadian Collieries (Dunsmuir) Limited No. 8 Mine, Comox Colliery, Cumberland.—J. S. Williams, manager; J. Weir, overman; L. Cooper and J. W. Smith, shift-bosses; T. Robertson, A. Dean, A. Maxwell, D. Waddington, T. Shields, A. Jones, J. Vaughan, F. Coates, C. Williams, P. Queen, J. Queen, J. Clarkson, T. Wynne, J. Knowles, J. Christie, F. Dixon, and J. Hamer, firebosses. This mine is 600 feet north of the Lake Trail road 2½ miles southwest of Courtenay. It is now the largest coal-producing mine on Vancouver Island, with an average output of 894 tons per day. The whole of the output is obtained from the No. 2 seam, which has an average thickness of 3 feet 9 inches, including rock bands, and lies 700 feet below the surface at the shafts. The seam dips 6 degrees in a northeasterly direction. It is reached by two shafts, each 1,000 feet deep, which penetrate to the lower or No. 1 seam, where operations are at present suspended due to heavily faulted ground. The mine is worked entirely by the longwall system. In December six longwall faces were in operation; five of these were 240 feet long, and one 300 feet long. Production in 1951 amounted to 214,060 tons over a working period of 239½ days with a crew of 322 men employed underground and 78 on the surface.

During 1951 the management maintained the policy started in 1949 of replacing shaker-conveyors with belt-conveyors on the faces, and of displacing secondary haulages in favour of troughed-belt gate-conveyors which transport the coal to loading points close to the main haulage. Huwood 26-inch bottom-belt-loading-type face-conveyors are now used on all the longwall faces except one. Four Huwood 30-inch troughed-belt gate-conveyors are in operation on the loading roads: the longest of these is delivering the coal at a point 1,200 feet from the face.

Two Goodman duckbill units and two Joy loaders have worked steadily on development work during 1951. A total of 1,820 feet of longwall face has been developed, and of this total, 920 feet was in production at the year-end. The principal areas of development have been in the No. 2 Dip section on the south side of the mine and in the North Main level section. An important development has been the starting of a new main dip slope off the Main level on the north side. This new slope, it is hoped, will facilitate the working of a substantial area of coal on the dip side of the North Main level. At the year-end it had been driven 540 feet.

An additional pump was installed near the shaft bottom during 1951 to pump water to the surface. This is a 5-stage Alan turbine pump of 750-gallons-per-minute capacity and driven by a 200-horsepower electric motor. This new installation was made to reduce the operating hours of the existing pump and to provide a convenient stand-by in the event of a breakdown.

An underground electrical distribution substation was installed and put into operation in December. It consists of one incoming and five outgoing panels, with space for additional panels as required. The plant is situated in a concrete-lined fireproof housing 200 feet from the shaft bottom on the South Main level.

Working conditions were found fairly satisfactory in the course of inspections, apart from occasions when small emissions and accumulations of methane were encountered. Until the above conditions were remedied, blasting was invariably suspended. The main airways of the mine were found to be fairly satisfactory. At the last inspection in

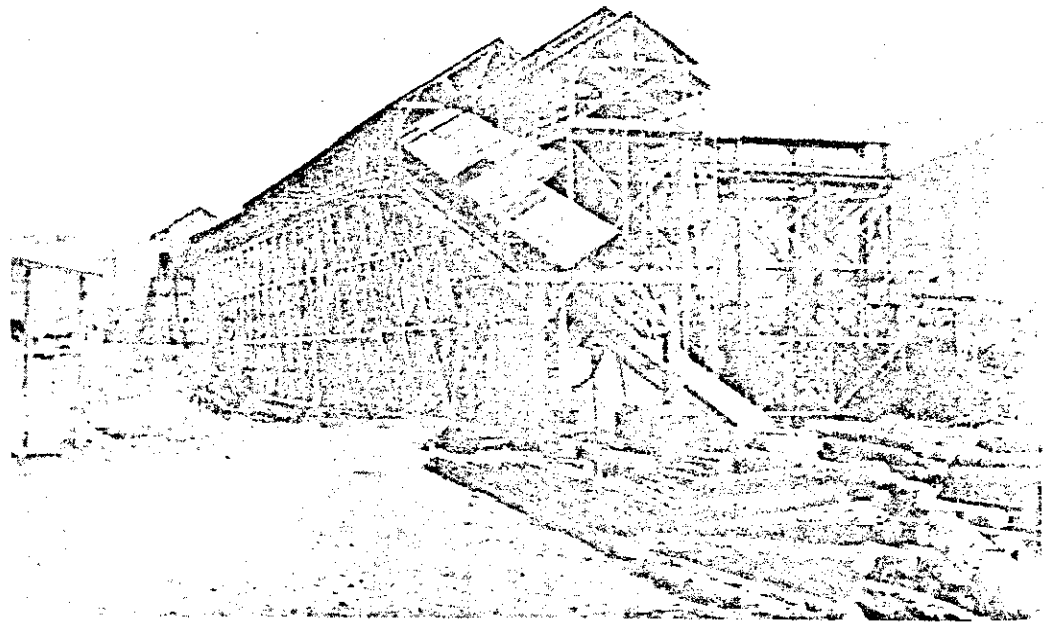
December, air measurements showed a total of 160,649 cubic feet of air per minute passing in the main returns for the use of 322 men in the full three-shift period of twenty-four hours. An air sample taken in December at the upcast shaft bottom indicated 0.33 per cent methane in the general body of the return air. One hundred and eight samples of dust were taken from the various roadways during 1951; all the samples showed a higher incombustible content than the minimum set by the "Coal-mines Regulation Act." One hundred and seventy tons of limestone dust was used during the year; 118 tons was used for treating roadways, and the remainder was used on the faces and for tamping shots. Water sprays are used on the belt-conveyor systems for keeping down air-borne dust.

First-aid arrangements have been maintained at a satisfactory standard, and twenty-one employees are qualified to render first aid to the injured. A well-equipped first-aid room is available on the surface.

Two mine-rescue teams of six men have attended periodic practices at Cumberland mine-rescue station. One of these two teams was formed and trained during the year and made a very good showing at the mine-rescue competition at Nanaimo.

One hundred and sixty-two accidents were reported and investigated, the total number of accidents being the same as for 1950. Six of these were classed as serious, and the remainder as minor accidents.

Tsable River Mine.—S. J. Lawrence, manager; T. Eccleston, overman; W. Bennie, M. Brown, A. Cullen, M. Frobisher, W. High, L. Hutchinson, and J. Thomson, firebosses. The mine is situated on the left bank of Tsable River, approximately 5 miles west of Buckley Bay. It operates in the upper or westerly portion of the Tsable River coalfield, which is separated from the lower or easterly part by a buried ridge of volcanic rocks



The Tsable River Colliery tipple.

which project up into the coal-bearing Comox formation. Both these parts of the Tsable River field are separated from the Cumberland coalfield by a large "want," the seams having been eroded and coarser sediments deposited in their place. The seam section being worked ranges in thickness from 6 to 10 feet and contains several bands of shale

1952

the outcrop is a soft shale, but this is replaced by conglomerate 100 feet in by from the portal of the level.

Production in 1952 amounted to 203 tons over a working period of 103 days with a crew of three men. Conditions were usually found satisfactory in the course of inspections. No accidents were reported during the year.

COMOX (49° 124° N.W.)

Canadian Collieries (Dunsmuir) Limited *No. 8 Mine, Comox Colliery, Cumberland.**—J. S. Williams, manager; J. Weir, overman; L. Cooper and J. W. Smith, shift-bosses; T. Robertson, A. Dean, A. Maxwell, D. Waddington, T. Shields, A. Jones, J. Vaughan, F. Coates, C. Williams, D. Morgan, J. Queen, and P. Queen, firebosses. This mine is 600 feet north of the Lake Trail road, 2½ miles southwest of Courtenay. During 1952 it maintained its position as the largest producing coal mine on Vancouver Island, with an average daily production of 889 tons. The entire output has been obtained from the No. 2 seam, which has an average thickness of 3 feet 9 inches, including rock bands, and lies 700 feet below the surface at the shafts. The seam dips 6 degrees in a northeasterly direction. It is reached by two shafts, each 1,000 feet deep, which penetrate to the lower or No. 1 seam, where operations have been suspended for some years due to heavily faulted ground. The mine has been worked entirely by the longwall system. In December five longwall faces were in operation; three were advancing longwalls, each 250 to 300 feet long, and two were retreating longwalls, 300 feet and 150 feet long respectively. Production has lately come mainly from the No. 2 dip sections on the north side and on the south side of the mine. All work in the North incline section ceased in May. In the North main level section the advancing longwalls were abandoned due to dirty seam conditions, and during the latter part of the year work in this section was restricted to a retreating face, 150 feet long, operating in the main level pillars.

Development work was continued until June in the No. 2 dip section on the north side of the mine. The No. 2 slope and counter slope were advanced a total distance of 700 feet, and two longwall faces, each 260 feet long, were headed out to the left of the slope. In January a large hoist, driven by a 250-horsepower electric motor, was installed in a concrete-lined housing at the top of No. 2 slope to handle production from faces off the slope. The two longwall faces in this section went into production on March 27th and May 9th respectively. At the beginning of June a new connection, 510 feet long, was completed between the bottom end of No. 2 counter slope and No. 1 left level off No. 1 dip slope; this provided an additional return airway for the section. This was the last development work done at No. 8 mine, and by a company policy decision the two Joy loaders and two Goodman duckbill units used in this work were then transferred to Tsable River mine.

The methods of working at this mine, involving the use of coal-cutters and conveyors, have been described in detail in previous Annual Reports.

Production in 1952 amounted to 187,453 tons over a working period of 210 days. Due to slack trade the mine worked only three days a week from the beginning of July to the end of November. In December a crew of 229 men was employed underground and 32 on the surface. The underground crew decreased by 93 men during the year, but 42 of these were transferred to Tsable River mine.

Working conditions were found fairly satisfactory in the course of inspections, apart from occasions when small emissions and accumulations of methane were encountered. Until these conditions were remedied, blasting was invariably suspended. During the early months of the year, difficulty was experienced on two longwalls on the south side due to unusually heavy methane emission, mainly from breaks in the roof strata. In

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addition to taking measures to increase the already large quantities of air circulating on these faces, the management was directed to take daily air samples at the return ends of the walls. Special arrangements were made for the rapid analysis of these samples for methane content at the Department of Mines laboratory at Victoria. These accurate daily measurements were of great value both to the management and the District Inspector in keeping in touch with the situation and in judging the efficacy of the remedial measures taken. As the situation improved, the sampling was carried out weekly instead of daily. It was not stopped altogether until conditions became normal. A total of more than fifty air samples was taken by company officials over a period of two and a half months. An additional fifteen air samples were taken by the District Inspector at the mine during the year. A sample taken in December at the bottom of the upcast shaft showed 0.47 per cent of methane in the general body of the return air. Air measurements taken at the same time showed 146,835 cubic feet of air per minute passing in the main returns.

One hundred and thirty-two samples of dust were taken from the various roadways in 1952; four of these samples showed a higher combustible content than the minimum set by the "Coal-mines Regulation Act." Seventeen check samples of mine dust were taken by the District Inspector during routine inspections; seven of these showed a higher combustible content than the minimum set by the "Coal-mines Regulation Act." In all cases where sampling showed a high combustible content, immediate treatment with inert dust was stipulated, followed by resampling. One hundred and forty-four tons of rock dust was used during the year; 110 tons was used for treating roadways, and the remainder was used on the faces and for tamping shots.

First-aid arrangements were maintained at a satisfactory standard, with a well-equipped first-aid room available on the surface.

A mine-rescue team of six men was maintained, which attended periodic practices at the Cumberland mine-rescue station.

One hundred and forty accidents were reported and investigated, a 13.6-per-cent decrease from the total for 1951. Four of these were classed as serious, and the remainder as minor. One dangerous occurrence was reported and investigated; this is described elsewhere in this report.

Tsable River Mine.—S. J. Lawrence, manager; T. Ecclestone, overman; J. Thomson, A. Somerville, M. Brown, A. Cullen, M. Frobisher, L. Hutchinson, W. Bennie, W. High, and C. Lewis, firebosses. This mine is situated on the left bank of Tsable River, approximately 5 miles west of Buckley Bay. It operates in the upper or westerly portion of the Tsable River coalfield, which is separated from the lower or easterly part by a buried ridge of volcanic rocks which project up into the coal-bearing Comox formation. Both these parts of the Tsable River field are separated from the Cumberland field by a large "want," the seams having been eroded and coarser sediments deposited in their place. The seam section being worked, known as the No. 2 seam, ranges in thickness from 6 to 10½ feet and contains several bands of shale of varying thickness. The roof strata consist of sandy shales and sandstones. The measures dip at 9 degrees in a northerly direction, but in the diagonal section the dip decreases to 6 degrees and is in a northeasterly direction.

The mine has been developed by a main slope and three counter slopes driven for 3,000 feet on the full dip of the seam. At the lower end of the main slope the direction of full dip changes toward the northeast, and the east side of the property in this area is crossed by a belt of faults and disturbed ground striking northwest. In April, 1951, to meet these new conditions, a main diagonal and two counter diagonals were set off at an angle of 50 degrees to the main slope and have now been driven in a northeasterly direction for 1,500 feet. These diagonals have penetrated through the belt of faults and have provided access to a large area of virgin coal beyond the faults. During 1952, development has been mainly in this section of the mine, and it is intended to extend the main slope haulage down the main diagonal in the near future.

1953

NOTES ON COAL MINES

VANCOUVER ISLAND INSPECTION DISTRICT

By A. R. C. James

The gross output of coal from the Vancouver Island Inspection District was 265,427 tons, a decrease of 34.2 per cent from the 1952 output. Two important producing mines were closed in 1953: the No. 8 mine at Cumberland ceased production on February 6th due to high operating costs, and the Bright mine at Cassidy was closed on November 27th, this mine being worked out. Both mines were operated by Canadian Collieries (Dunsmuir) Limited. By the end of 1953 only one large mine was operating, the Tsable River mine of Canadian Collieries (Dunsmuir) Limited. Production at this mine in 1953 increased by almost 37 per cent from the 1952 output to 166,990 tons.

The decline of the Island coal-mining industry is particularly striking when the 1953 production is compared with that of ten years ago. Present output is little more than one-third that of 1943, and production in 1954 may be still lower. Since the closure of the Bright mine, the only mines left in this field are very small ones operating in outcrops, pillars, and barriers left during earlier operations. The exhaustion of the once highly productive Nanaimo coalfield is an important factor in this decline. Other factors contributing to decline are lack of markets due to competition from other fuels, relatively high operating costs, and the depletion of the more easily worked seams in the Comox coalfield.

It is pleasing to report that 1953 has been a year free from fatal accidents in the Vancouver Island coal mines. There were three accidents classified as serious, one of which occurred during the dismantling of No. 8 mine, one at Bright mine, and one at Tsable River. One of these accidents resulted from a man falling on to the drum of a small tigger hoist, another occurred when a trip jumped a switch, and the third was due to a car becoming derailed while being lowered by hand down a crosscut. Two of the accidents involved fractures of the right tibia, one simple and the other compound-comminuted, and the third resulted in a fracture of the right humerus.

In addition to the above, 163 minor accidents have been reported and investigated, representing a 35-per-cent decrease from the 1952 figure.

Five dangerous occurrences were reported and investigated; all but one occurred at the Tsable River mine. Two involved runaway trips on the main slope: the first was due to interference with the hoist by an unauthorized person on a Sunday morning, and the second was caused by a broken coupling link. Another dangerous occurrence was a sudden fall of roof and displacement of timber sets without warning at the face of a working-place in the Diagonal section of the mine. The fourth occurrence was the fracture of the main shaft on the main hoist. The fifth dangerous occurrence took place at the No. 8 Timberlands mine, when a small coal-chute on the surface collapsed. In all cases, steps have been taken to avoid a recurrence of these incidents.

The annual mine-rescue and first-aid meet organized by the Vancouver Island branch of the British Columbia Mine Safety Association was held at Cumberland on June 30th. Two teams from Tsable River mine and a visiting team from Copper Mountain mine participated in the mine-rescue competition, and a high standard of performance was maintained. The winning team was the Tsable River No. 1 team, captained by J. Thomson.

Canadian Collieries (Dunsmuir) Limited

Company office, Union Bay. F. Ronald Graham, chairman of the board; R. Whittal, president; E. O. T. Simpson, general manager; W. Frew, district superintendent, Nanaimo; W. Johnstone, district superintendent, Cumberland. In 1953 this company operated the

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Bright mine at Cassidy (closed on November 27th), and the No. 8 mine (closed on February 6th) and Tsable River mine in the Cumberland district. Descriptions of these operations and progress notes on them are given in the following pages according to district.

NANAIMO (49° 123' S.W.)

Bright Mine, Cassidy.—W. Frew, manager; J. Wilson, overman; M. Brodrick, A. Dunn, F. Johnston, and J. Unsworth, firebosses. This mine is in Sections 1 and 2, Range 7, in the Cranberry district, near Cassidy, approximately 9 miles south of Nanaimo. The workings are in the Douglas seam, in an area immediately to the south of the old Granby No. 2 workings. Operations in 1953 were confined to the extraction of pillars. This work was completed and the mine was closed on November 27th, after being in production for three years. Total production from the mine was 199,558 tons. Production in 1953 was 76,006 tons over a working period of 205 days with a crew of sixty-four men underground and eleven on the surface. A detailed description of the equipment and method of working this mine was contained in the Annual Report for 1952.

Working conditions were usually found satisfactory in the course of inspections. One serious accident and thirteen minor accidents were reported and investigated.

**Chambers Strip
Mine, Extension**

R. H. Chambers and associates, operators; R. H. Chambers, manager. This small strip pit is in Section 14, Range 7, in the Douglas district, near Extension. The area at present being mined was opened up during the latter part of 1952 and comprises a small section of the Wellington seam lying close to the surface in the vicinity of the old Vancouver slope workings. The seam dips gently in a westerly direction, and the thickness of overburden varies from 8 to 15 feet. The following seam section is typical, though in part of the property the top coal has been eroded: Top coal, 4 feet 5 inches; carbonaceous shale, 1 foot 6 inches; coal, 1 foot 5 inches; rock, 4 inches; coal, 1 foot 8 inches.

By the end of 1953 the seam had been mined out over an area of about 100 feet square (producing 1,165 tons) and enough overburden had been removed to allow mining to continue throughout the winter. The coal is hand-loaded into cars which are hauled up to the tippie by a gasoline-driven hoist. A small shaker screen sorts the coal into over 2-inch, 1- to 2-inch, and under 1-inch sizes.

Total production in 1953 was 875 tons over a working period of 172 days with a crew of two men. Working conditions were found satisfactory in the course of inspections, and no accidents were reported.

**No. 7 Mine,
Cassidy**

A. Carroll and associates, operators; H. Kirkpatrick, fireboss. This mine is at Cassidy, in Range 7, Section 2, and the eastern 500 feet of Range 6, Section 2, in the Cranberry district. The mine was closed in May, 1953, due to high operating costs after producing 5,918 tons since the start of mining in 1949. The seam worked is a purely local deposit and lies 50 to 60 feet stratigraphically above the Douglas seam. From the mine portal it dips 20 degrees in a southerly direction. The trough of a fold is reached at a point 300 feet south of the outcrop and the seam then rises again. The seam is normally about 7 feet thick, and a typical section is as follows: Coal, 1 foot 3 inches; shale, 8½ inches; coal, 10½ inches; carbonaceous shale, 1 foot 5 inches; coal, 6 inches; bone, 4 inches; coal, 2 feet. The immediate roof of the seam is a strong grey shale which is overlain by conglomerate.

A main slope has been driven southwest down the dip of the seam for 340 feet; four levels have been driven to the right off the slope, the longest being 240 feet, and four levels and a diagonal have been driven to the left off the slope. The diagonal was driven 330 feet, and five short levels have been driven from it. A substantial amount of coal, probably at least 8,000 tons, remains blocked out in pillars in the mine. Devel-

LABOUR AND EMPLOYMENT.

During 1938, 2,962 persons were employed in and about the coal mines of the Province, a decrease of 191 persons from that of 1937.

Taking the average of all the mines in Vancouver Island District, about 36 per cent. of the working-days was lost through lack of trade. In the Nicola-Princeton District the different collieries worked on an average of 74 per cent. of the working-days. In the East Kootenay District the average for the year was about 66 per cent.

The table on page 7 shows the number of persons ordinarily employed in and about the mines, distinguishing the persons and different classes employed underground and above ground, compiled from the returns furnished by the owners.

FUEL-OIL COMPETITION.

During 1938 imports of crude oil for refining in British Columbia totalled 189,917,000 gallons; in addition to which 5,789,000 gallons of fuel-oil was imported for use in the Province and 31,169,000 gallons of fuel-oil was brought in duty free for use in ships' bunkers.

COMPETITION OF COAL PRODUCED OUTSIDE BRITISH COLUMBIA.

During 1938 the importation of coal into British Columbia from the United States consisted of 280 tons of anthracite, 2,201 tons of bituminous, and 2,617 tons of lignite.

Imports from Great Britain consisted of 57 tons of bituminous coal, and from Japan 417 tons of bituminous coal.

Alberta coal sold in British Columbia amounted to 238,435 tons. In addition to this, 68,640 tons of Alberta coke and 3,817 tons of Alberta briquettes were sold in this Province.

The following table shows the amount of Alberta coal brought into British Columbia during past years:—

| Year. | Short Tons. | Year. | Short Tons. |
|-------|-------------|-------|-------------|
| 1925 | 117,037 | 1932 | 136,188 |
| 1926 | 127,858 | 1933 | 119,026 |
| 1927 | 187,028 | 1934 | 123,968 |
| 1928 | 262,198 | 1935 | 221,758 |
| 1929 | 247,060 | 1936 | 244,928 |
| 1930 | 227,385 | 1937 | 269,023 |
| 1931 | 193,060 | 1938 | 238,435 |

Of the 1,075,884 tons of British Columbia coal marketed 175,233 tons were sold in the Provinces of Alberta, Saskatchewan, Manitoba, and Ontario, 153,267 tons was sold for ships' bunkers, and 91,445 tons was exported to the United States; the total sales in the Province being 655,939 tons of British Columbia coal, 310,882 tons of Alberta coal, coke, and briquettes, and 5,292 tons of imported coal; so that approximately one-third of all the coal used in British Columbia was produced outside the Province.

ACCIDENTS IN AND AROUND COAL MINES.

During 1938, 2,962 persons were employed in and around the coal mines. Ten fatal accidents occurred during the year as compared with ten for 1937.

The ratio of fatal accidents per 1,000 persons employed was 3.37 as compared with 3.17 in 1937. In 1936 the ratio was 2.84; in 1935, 1.67; in 1934, 2.07; in 1933, 0.97; in 1932, 2.21; in 1931, 1.22; in 1930, 11.62; and in 1929, 2.38. The average for the ten-year period being 3.43.

The number of fatal accidents per 1,000,000 tons produced during 1938 was 7.63; during 1937 the figure was 6.92; in 1936, 5.94; in 1935, 4.21; in 1934, 4.45; in 1933, 2.37; in 1932, 5.21; in 1931, 2.81; in 1930, 28.64; and in 1929, 5.33. The average for the ten-year period being 8.40 per 1,000,000 tons of coal mined.

ACCIDENTS.

RATIO OF ACCIDENTS.

| District. | ACCIDENT DEATH-RATE. | | | |
|------------------------|-----------------------------|-------|-----------------------------------|-------|
| | Per 1,000 Persons employed. | | Per 1,000,000 Tons of Coal mined. | |
| | 1938. | 1937. | 1938. | 1937. |
| Vancouver Island | 0.54 | 3.96 | 1.46 | 9.77 |
| Nicola-Princeton | 2.41 | ..... | 5.34 | ..... |
| East Kootenay | 11.54 | 3.18 | 18.43 | 4.35 |
| Northern ..... | ..... | ..... | ..... | ..... |
| Totals (1938) | 3.27 | ..... | 7.63 | ..... |
| Totals (1937) ..... | ..... | 3.17 | ..... | 6.92 |

The details regarding the occurrences of the fatal accidents in coal mines during 1938 are as follows:—

The fatal accident which occurred to Asbjorn Hagen, miner, No. 4 mine, Coalmont Collieries, Ltd., on February 8th was due to a fall of coal at the face of a new skip which deceased was starting; a bridge timber had been put up and preparations being made for the first set of timber when some coal from the face struck Hagen and dislocated his neck; he died from his injuries on February 14th.

The fatal accident which occurred to Robert McFegan, overman, No. 3 mine, Michel Colliery, on March 12th was due to a fall of coal and roof while deceased and others under his supervision were uncovering a buried compressed-air line that had been laid in along a roadway which had been abandoned; temporary timber support had been set by this crew immediately before the accident, but it proved insufficient as a body of coal rolled from the rib and was followed by a fall of roof that completely buried deceased, who was dead when extracted from the cave.

The fatal accident which occurred to Andro Laskodi, miner, No. 1 mine, Michel Colliery, on April 5th was due to fall of coal and roof at the face where deceased and his partner were at work; the place was closely timbered, but a sudden weighting of the roof at the face broke the last two stringers and a large mass of rock came down; deceased was killed instantly.

The fatal accident to Edward Morrison, fireboss; William H. Cartwright, fireboss; and John Phillips, mechanic "B" mine, Michel Colliery, on July 5th was due to an explosion; details of this are given in another part of this report.

The fatal accident to William Green, driver boss; Thomas Manning, miner; and William A. Brown in No. 1 East mine, Coal Creek Colliery, on September 20th was due to a bump; details of this are given in another part of this report.

The fatal accident to Robert Forrester, carpenter, No. 1 mine, Western Fuel Corporation of Canada, Ltd., on October 25th occurred at the tipple on the surface; deceased was engaged in reriffing a coal-washing table and was using an extension electric-light cord. The light cord came in contact with a revolving shaft and deceased was entangled in the coils of the cord and drawn around the shaft. He died from his injuries a few hours later. Deceased had done this same work on numerous occasions during the previous fifteen years.

NOTE.—In addition to above fatalities during 1938, Eskel Eskelson, construction-man, who was injured on the surface at Michel Colliery, November 15th, 1936, died on January 7th, 1938.

EXPLOSION IN "B" MINE, MICHEL COLLIERY.

On July 5th an explosion occurred in "B" Mine, Michel Colliery, and caused the death of Edward Morrison, fireboss; Wm. H. Cartwright, fireboss; and John Phillips, mechanic. At this colliery four seams are worked and, in descending order, are known as "B" seam, "A" seam, No. 1 seam, and No. 3 seam; there is approximately 120 feet of strata between "B" and "A" seams; 180 feet between "A" and No. 1 seam; and 220 feet between Nos. 1 and 3 seams.

These seams outcrop on the northern side of the Crownsnest Pass and dip into the mountain; the mine has been developed by main cross-measure adit-tunnels which intersect the seams in descending order; the workings in each seam have been driven to the surface at the

LABOUR AND EMPLOYMENT.

During 1949, 2,306 persons were employed in and about the coal mines of the Province, a decrease of 160 from 1948. Fewer men were employed in stripping operations.

The maximum number of working-days is rated at 290, but the largest mines work only five days per week by agreement with the Miners' Union. In the Vancouver Island District approximately 20 per cent. of the possible working-days were lost because of working the five-day week and absenteeism, and because during the latter part of 1949 the mines in the Comox area were worked only three or four days per week because of lack of demand for coal. In the Nicola-Princeton District over 20 per cent. of the working-days were lost because of poor demand for coal from this area. In the East Kootenay District the loss of working-days averaged about 17 per cent. Floods in the area during June, and absenteeism, were mainly responsible for this loss.

COMPETITION FROM COAL PRODUCED OUTSIDE
OF BRITISH COLUMBIA.

During 1949 the shipment of Alberta coal to British Columbia totalled 891,132 tons; coke shipped was 54,532 tons, and briquettes 47,235 tons. The following table shows the amount of Alberta coal brought into British Columbia during the past ten years:—

| Year. | Short Tons. | Year. | Short Tons. |
|-------|-------------|-------|-------------|
| 1940 | 311,232 | 1945 | 868,396 |
| 1941 | 304,928 | 1946 | 982,413 |
| 1942 | 652,222 | 1947 | 899,403 |
| 1943 | 963,000 | 1948 | 945,700 |
| 1944 | 678,960 | 1949 | 891,132 |

Of the 1,369,463 tons of coal marketed, 250,769 tons was sold for industrial uses in Alberta, Saskatchewan, Manitoba, Ontario, and Yukon Territory; 474,631 tons was sold for railroad use in Canada; 11,446 tons was sold for railroad use in United States; 93,519 tons was exported to the United States; and 21,519 tons was sold for ships' bunkers. The amount sold for domestic and industrial uses in the Province was 517,579 tons.

ACCIDENTS IN AND AROUND COAL MINES.

During 1949, 2,306 persons were employed in and around coal mines, including strip-mining operations. One fatal accident occurred during the year, as compared with five during 1948. The number of fatal accidents per 1,000 persons employed was 0.43, compared with 2.04 in 1948, 0.82 in 1947, 1.73 in 1946, 2.05 in 1945, 1.06 in 1944, 2.80 in 1943, 4.23 in 1942, 1.47 in 1941, and 2.08 in 1940. The average for the ten-year period was 1.87.

The number of fatal accidents per 1,000,000 tons of coal produced during 1949 was 0.52, compared with 2.77 in 1948.

The following table shows the collieries at which fatal accidents occurred during 1949, with comparative figures for 1948:—

| Name of Company. | Name of Colliery. | 1949. | 1948. |
|---------------------------------|-------------------------------|-------|-------|
| Canadian Collieries (D.), Ltd. | No. 8 mine, Cumberland | ..... | 1 |
| Canadian Collieries (D.), Ltd. | White Rapids mine | ..... | 1 |
| Crow's Nest Pass Coal Co., Ltd. | Elk River Colliery | ..... | 1 |
| Crow's Nest Pass Coal Co., Ltd. | Michel Colliery | 1 | ..... |
| Southern Trucking Co., Ltd. | Corbin Colliery (strip) | ..... | 1 |
| Fred Mannix & Co., Ltd. | Black mine, Princeton (strip) | ..... | 1 |
| Totals | | 1 | 5 |

The following table shows the various causes of fatal accidents in 1949 and their percentages of the whole, together with comparative figures for 1948:—

| Cause. | 1949. | | 1948. | |
|---|--------|-----------|--------|-----------|
| | Number | Per Cent. | Number | Per Cent. |
| By falls of roof and coal..... | 1 | 100.00 | 2 | 40.00 |
| By mine cars and haulage (underground)..... | ..... | ..... | 1 | 20.00 |
| By trucking and haulage (strip mines)..... | ..... | ..... | 2 | 40.00 |
| Totals..... | 1 | 100.00 | 5 | 100.00 |

The following table shows the number of tons of coal mined for each fatal accident in their respective classes in the years 1949 and 1948:—

| Cause. | 1949. | | 1948. | |
|--------------------------------|----------------------------|---|----------------------------|--|
| | Number of Fatal Accidents. | Tons of Coal mined per Fatal Accident.* | Number of Fatal Accidents. | Tons of Coal mined per Fatal Accident. |
| By falls of roof and coal..... | 1 | 1,917,296 | 2 | 640,765 |
| By mine cars and haulage..... | ..... | ..... | 1 | 1,281,530 |
| Totals..... | 1 | 1,917,296 | 3 | 427,177 |

* Excludes coal from strip mines.

The following table shows the number of tons of coal mined in stripping operations for each fatal accident in their respective classes in the years 1949 and 1948:—

| Cause. | 1949. | | 1948. | |
|-----------------------|----------------------------|--|----------------------------|--|
| | Number of Fatal Accidents. | Tons of Coal mined per Fatal Accident. | Number of Fatal Accidents. | Tons of Coal mined per Fatal Accident. |
| By truck haulage..... | | | 2 | 263,744 |

The following table shows the fatalities from various causes in coal mines during the year 1949, compared with 1948, according to inspection districts:—

| District. | NUMBER OF DEATHS FROM ACCIDENTS. | | | TOTALS. | |
|-----------------------|----------------------------------|------------------------|-------------------------------|---------|-------|
| | Falls of Roof and Coal. | Mine Cars and Haulage. | Trucking and Haulage (Strip). | 1949. | 1948. |
| Vancouver Island..... | ..... | ..... | ..... | ..... | 2 |
| Nicola-Princeton..... | | | | | 1 |
| East Kootenay..... | 1 | | | 1 | 2 |
| Northern..... | | | | | |
| Province, 1949..... | 1 | | | 1 | |
| Province, 1948..... | 2 | 1 | 2 | | 5 |

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RATIO OF ACCIDENTS.

| District. | ACCIDENT DEATH RATE. | | | |
|-----------------------|-----------------------------|-------|-----------------------------------|-------|
| | Per 1,000 Persons employed. | | Per 1,000,000 Tons of Coal mined. | |
| | 1949. | 1948. | 1949. | 1948. |
| Vancouver Island..... | ..... | 2.08 | ..... | 4.45 |
| Nicola-Princeton..... | ..... | 8.00 | ..... | 19.34 |
| East Kootenay..... | 0.88 | 1.94 | 0.87 | 1.55 |
| Northern..... | ..... | ..... | ..... | ..... |
| Province, 1949..... | 0.43 | ..... | 0.52 | ..... |
| Province, 1948..... | ..... | 2.04 | ..... | 2.77 |

During 1949 there was only one fatal accident connected with actual operations in underground coal mines and there were no fatal accidents in strip-mining operations.

On February 15th, 1949, Michael Kulcar, miner, was instantly killed at Michel Colliery. He was setting a row of posts next to a pillar for a new conveyer run when a piece of rock fell from the roof.

In addition to one fatal accident, a total of 420 of a serious nature were reported to the Department by the management of the various mines. All these accidents were investigated and reported by the Mine Inspectors.

The following table shows the occupations of the men involved in these accidents and the percentage of the total number for each occupation. The fatal accident is included in the total.

ACCIDENTS IN COAL MINES, 1949, CLASSIFIED AS TO OCCUPATION.

| Occupation. | Number of Accidents. | Percentage of Accidents. |
|---------------------------------|----------------------|--------------------------|
| Underground— | | |
| Brushers | 40 | 9.5 |
| Drillers and facemen | 87 | 20.7 |
| Loaders and muckers | 125 | 29.8 |
| Panmen | 15 | 3.6 |
| Haulagemen | 71 | 17.0 |
| Trackmen and pipe-fitters | 11 | 2.6 |
| Firebosses | 15 | 3.6 |
| Timbermen | 10 | 2.2 |
| Miscellaneous | 6 | 1.5 |
| Surface— | | |
| Shops | 2 | 0.5 |
| Labour | 32 | 7.6 |
| Miscellaneous | 6 | 1.4 |
| Totals | 420 | 100.0 |

LABOUR AND EMPLOYMENT

During 1950, 2,261 persons were employed in and about the coal mines of the Province, a decrease of 45 from 1949.

On account of the 5-day week being in force throughout the Province at the largest mines, and the legal holidays, the maximum number of working-days is rated at 254. In the Vancouver Island District approximately 8.6 per cent of the possible working-days was lost because of the lack of demand for coal. In the East Kootenay District the loss of working-days averaged 15.3 per cent, due mainly to the severe weather conditions experienced in the early part of the year and to shortage of railway cars at certain periods.

COMPETITION FROM COAL PRODUCED OUTSIDE OF BRITISH COLUMBIA

During 1950 the shipment of Alberta coal to British Columbia totalled 873,558 tons, coke shipped was 13,951 tons, and briquettes 40,036 tons. The following table shows the amount of Alberta coal brought into British Columbia during the past ten years:—

| Year | Short Tons | Year | Short Tons |
|-----------|------------|-----------|------------|
| 1941..... | 304,928 | 1946..... | 982,413 |
| 1942..... | 652,222 | 1947..... | 899,403 |
| 1943..... | 963,000 | 1948..... | 945,700 |
| 1944..... | 678,960 | 1949..... | 891,132 |
| 1945..... | 868,396 | 1950..... | 873,558 |

Of the 1,341,201 tons of British Columbia coal marketed, 345,635 tons was sold for industrial uses in Alberta, Saskatchewan, Manitoba, Ontario, and Yukon Territory; 359,574 tons was sold for railroad use in Canada; 19,793 tons was sold for railroad use in United States; 93,619 tons was exported to the United States; and 9,623 tons was sold for ships' bunkers. The amount sold for domestic and industrial uses in the Province was 512,957 tons.

ACCIDENTS IN AND AROUND COAL MINES

During 1950, 2,261 persons were employed in and around coal mines, including strip-mining operations. Five fatal accidents occurred during the year, as compared with one during 1949. The number of fatal accidents per 1,000 persons employed was 2.21, compared with 0.43 in 1949, 2.04 in 1948, 0.82 in 1947, 1.73 in 1946, 2.05 in 1945, 1.06 in 1944, 2.80 in 1943, 4.23 in 1942, and 1.47 in 1941. The average for the ten-year period was 1.87.

The number of fatal accidents per 1,000,000 tons of coal produced during 1950 was 2.8, compared with 0.52 in 1949.

The following table shows the collieries at which fatal accidents occurred during 1950, with comparative figures for 1949:—

| Name of Company | Name of Colliery | 1950 | 1949 |
|------------------------------------|---------------------------------|------|------|
| Canadian Collieries (D.) Ltd..... | No. 8 mine, Comox Colliery..... | 1 | — |
| Canadian Collieries (D.) Ltd..... | White Rapids..... | 1 | — |
| Crow's Nest Pass Coal Co. Ltd..... | Michel Colliery..... | 2 | 1 |
| Crow's Nest Pass Coal Co. Ltd..... | Eik River Colliery..... | 1 | — |
| Totals..... | | 5 | 1 |

The following three tables classify the fatal accidents in coal mines in 1950 as to cause, as to quantity of coal mined per accident, and as to inspection districts.

FATAL ACCIDENTS CLASSIFIED AS TO CAUSE

| Cause | 1950 | | 1949 | |
|--|--------|----------|--------|----------|
| | Number | Per Cent | Number | Per Cent |
| By falls of roof and coal..... | 1 | 20.00 | 1 | 100.00 |
| By mine cars and haulage (underground)..... | 1 | 20.00 | — | — |
| By falling while carrying rail..... | 1 | 20.00 | — | — |
| By coal-cutter haulage pin pulling out and striking man..... | 1 | 20.00 | — | — |
| By falling off icy railway car..... | 1 | 20.00 | — | — |
| Totals..... | 5 | 100.00 | 1 | 100.00 |

FATAL ACCIDENTS CLASSIFIED AS TO QUANTITY OF COAL MINED

| Cause | 1950 | | 1949 | |
|--|---------------------------|--------------------------------|---------------------------|--------------------------------|
| | Number of Fatal Accidents | Coal Mined per Fatal Accident* | Number of Fatal Accidents | Coal Mined per Fatal Accident* |
| By falls of roof and coal..... | 1 | Tons 1,481,435 | 1 | Tons 1,589,131 |
| By mine cars and haulage (underground)..... | 1 | 1,481,435 | — | — |
| By falling while carrying rail..... | 1 | 1,481,435 | — | — |
| By coal-cutter haulage pin pulling out and striking man..... | 1 | 1,481,435 | — | — |
| By falling off icy railway car..... | 1 | 1,481,435 | — | — |
| Average..... | 1 | 296,287 | 1 | 1,589,131 |

* Excludes coal from strip mines.

NOTE.—There were no fatal accidents in strip-mining operations in the years 1950 and 1949.

FATAL ACCIDENTS CLASSIFIED AS TO INSPECTION DISTRICTS

| District | Number of Deaths from Accidents | | | | | Totals | |
|-----------------------|---------------------------------|-----------------------|-----------------------------|--------------------------------------|-------------------------|--------|------|
| | Falls of Roof and Coal | Mine Cars and Haulage | Falling while Carrying Rail | Coal-cutter Haulage Pin Striking Man | Falling Off Railway Car | 1950 | 1949 |
| Vancouver Island..... | — | 1 | — | 1 | — | 2 | — |
| Nicola-Princeton..... | — | — | — | — | — | — | — |
| East Kootenay..... | 1 | — | 1 | — | 1 | 3 | 1 |
| Northern..... | — | — | — | — | — | — | — |
| Province, 1950..... | 1 | 1 | 1 | 1 | 1 | 5 | — |
| Province, 1949..... | 1 | — | — | — | — | — | 1 |

RATIO OF ACCIDENTS

| District | Accident Death Rate | | | |
|-----------------------|----------------------------|------|----------------------------------|------|
| | Per 1,000 Persons Employed | | Per 1,000,000 Tons of Coal Mined | |
| | 1950 | 1949 | 1950 | 1949 |
| Vancouver Island..... | 2.15 | — | 3.47 | — |
| Nicola-Princeton..... | 2.55 | 0.88 | 2.63 | 0.81 |
| East Kootenay..... | — | — | — | — |
| Northern..... | — | — | — | — |
| Province, 1950..... | 2.21 | — | 2.84 | — |
| Province, 1949..... | — | 0.43 | — | 0.52 |

During 1950 there were five fatal accidents—four connected with actual operations in underground coal mines and one in the railway yard connected with a colliery.

On February 27th, 1950, Giovanni Ferrarelli, tracklayer's helper at Elk River Colliery, was helping to carry a rail when he slipped and apparently suffered internal injuries. He resumed work after the accident but suffered a relapse and died on July 5th, 1950.

On February 28th, 1950, William Dutka, miner, was fatally injured at Michel Colliery. Dutka, on being warned by partner that some roof was about to fall, jumped across the conveyor, but was struck by a post which was dislodged by the falling rock. He died on March 5th, 1950.

On July 4th, 1950, Thomas Easterbrook, while operating a coal-cutter at White Rapids mine, was struck on the back by the haulage pin that pulled out. He died on July 6th, 1950.

On August 2nd, 1950, Frederick Simister, pipe-fitter at the Comox No. 8 mine, was struck and fatally injured by a trip of cars while walking along a level. He died after admission to the hospital the same day.

On November 19th, 1950, Andrew Nestuk, labourer at Michel Colliery by-product plant, was found dead alongside a railway coke car. He had been wetting the coke in the car, which had been on fire, when he apparently fell from the top of the car and was fatally injured.

Including the above-noted fatal accidents, 510 accidents involving loss of more than seven days were reported to the Department by the management of the various mines. All these accidents were investigated and reported by the Mine Inspectors.

The following three tables classify the accidents in coal mines in 1950 as to occupations of the men involved, as to cause, and as to injury. The fatal accidents are included in the total.

ACCIDENTS CLASSIFIED AS TO OCCUPATION

| Occupation | Number of Accidents | Percentage of Accidents |
|---------------------------------|---------------------|-------------------------|
| Underground— | | |
| Miners | 227 | 44.5 |
| Drillers and facemen..... | 9 | 1.8 |
| Conveyormen and muckers..... | 22 | 4.3 |
| Haulagemen | 72 | 14.1 |
| Trackmen and mechanics..... | 25 | 4.9 |
| Supervisors | 28 | 5.5 |
| Timbermen | 27 | 5.3 |
| Coal-cutters | 14 | 2.7 |
| Miscellaneous | 8 | 1.6 |
| Surface— | | |
| Shops | 15 | 3.0 |
| Surface | 30 | 5.9 |
| Preparation and coke-ovens..... | 23 | 4.5 |
| Miscellaneous | 10 | 1.9 |
| Totals..... | 510 | 100.0 |

| Year | Short Tons | Year | Short Tons |
|------------|------------|------------|------------|
| 1943 | 963,000 | 1948 | 945,700 |
| 1944 | 678,960 | 1949 | 891,132 |
| 1945 | 868,396 | 1950 | 873,558 |
| 1946 | 982,413 | 1951 | 898,533 |
| 1947 | 899,403 | 1952 | 1,021,484 |

Of the 1,137,986 tons of British Columbia coal marketed, 258,853 tons was sold for domestic and industrial uses in Alberta, Saskatchewan, Manitoba, Ontario, and Yukon Territory; 471,035 tons was sold for railway use in Canada; 62,200 tons was exported to the United States; 39,917 tons was exported to foreign countries other than the United States; and 10,712 tons was sold for ships' bunkers. The amount sold for domestic and industrial uses in the Province was 295,269 tons.

ACCIDENTS IN AND AROUND COAL MINES

During 1952, 1,681 persons were employed in and around coal mines, including strip-mining operations. Three fatal accidents occurred during the year, as compared with six during 1951. The number of fatal accidents per 1,000 persons employed was 1.78, compared with 3.11 in 1951, 2.21 in 1950, 0.43 in 1949, 2.04 in 1948, 0.82 in 1947, 1.73 in 1946, 2.05 in 1945, 1.06 in 1944, and 2.80 in 1943. The average for the ten-year period was 1.78.

The number of fatal accidents per 1,000,000 tons of coal produced in 1952 was 1.81, compared with 3.21 in 1951.

The following table shows the collieries at which fatal accidents occurred in 1952, with comparative figures for 1951:—

| Name of Company | Name of Colliery | 1952 | 1951 |
|------------------------------------|--------------------------------|------|------|
| Crow's Nest Pass Coal Co. Ltd..... | Michel Colliery | 1 | 3 |
| Crow's Nest Pass Coal Co. Ltd..... | Elk River Colliery | 1 | 2 |
| Canadian Collieries (D.) Ltd..... | Tsable River | — | 1 |
| Canadian Collieries (D.) Ltd..... | No. 10, South Wellington | 1 | — |
| Totals..... | | 3 | 6 |

The following three tables classify the fatal accidents in coal mines in 1952 as to cause, as to quantity of coal per accident, and as to inspection districts.

FATAL ACCIDENTS CLASSIFIED AS TO CAUSE

| Cause | 1952 | | 1951 | |
|---|--------|----------|--------|----------|
| | Number | Per Cent | Number | Per Cent |
| By falls of roof and coal | 1 | 33.33 | 5 | 50.00 |
| By mine cars and haulage (underground)..... | — | — | 1 | 16.66 |
| Asphyxiated by methane gas | — | — | 1 | 16.66 |
| Asphyxiated by being covered with coal from blowout | — | — | 1 | 16.66 |
| By falling power-line pole | 1 | 33.33 | — | — |
| By runaway stone-boat | 1 | 33.33 | — | — |
| Totals | 3 | 100.00 | 6 | 100.00 |

FATAL ACCIDENTS CLASSIFIED AS TO QUANTITY OF COAL MINED

| Cause | 1952 | | 1951 | |
|---|---------------------------|--|---------------------------|--|
| | Number of Fatal Accidents | Coal Mined per Fatal Accident ¹ | Number of Fatal Accidents | Coal Mined per Fatal Accident ¹ |
| By falls of roof and coal | 1 | Tons 1,388,732 | 3 | Tons 478,324 |
| By mine cars and haulage (underground) | --- | --- | 1 | 1,434,974 |
| Asphyxiated by methane gas | --- | --- | 1 | 1,434,974 |
| Asphyxiated by being covered with coal from blowout | --- | --- | 1 | 1,434,974 |
| By falling power-line pole | 1 | 1,388,732 | --- | --- |
| By runaway stone-boat | 1 | 1,388,732 | --- | --- |
| Average | 3 | 462,910 | 6 | 239,162 |

¹ Excludes coal from strip mines.
NOTE.—There were no fatal accidents in strip mining operations in the years 1952 and 1951.

FATAL ACCIDENTS CLASSIFIED AS TO INSPECTION DISTRICTS

| District | Number of Deaths from Accidents | | | | | | Totals | |
|------------------------|---------------------------------|-----------------------|----------------------------|--|-------------------------|--------------------|--------|------|
| | Falls of Roof and Coal | Mine Cars and Haulage | Asphyxiated by Methane Gas | Asphyxiated by Being Covered with Coal | Falling Power-line Pole | Runaway Stone-boat | 1952 | 1951 |
| Vancouver Island | --- | --- | --- | --- | 1 | --- | 1 | 1 |
| Nicola-Princeton | --- | --- | --- | --- | --- | --- | --- | --- |
| East Kootenay | 1 | --- | --- | --- | --- | 1 | 2 | 5 |
| Northern | --- | --- | --- | --- | --- | --- | --- | --- |
| Province, 1952 | 1 | --- | --- | --- | 1 | 1 | 3 | --- |
| Province, 1951 | 3 | 1 | 1 | 1 | --- | --- | --- | 6 |

RATIO OF FATAL ACCIDENTS

| District | Accident Death Rate | | | |
|------------------------|----------------------------|------|----------------------------------|------|
| | Per 1,000 Persons Employed | | Per 1,000,000 Tons of Coal Mined | |
| | 1952 | 1951 | 1952 | 1951 |
| Vancouver Island | 1.80 | 1.34 | 2.47 | 1.85 |
| Nicola-Princeton | --- | --- | --- | --- |
| East Kootenay | 1.91 | 4.79 | 1.66 | 5.81 |
| Northern | --- | --- | --- | --- |
| Province, 1952 | 1.78 | --- | 1.81 | --- |
| Province, 1951 | --- | 3.11 | --- | 3.21 |

In 1952 there were three fatal accidents at the coal mines in the Province—two underground and one on the surface.

On January 28th, 1952, Adolph Jack Delmas, an electrician working at No. 10 mine, South Wellington, was fatally injured when the power-line pole on which he was working broke off at ground-level and fell. Delmas was engaged in stripping material from the pole when the accident occurred. The pole was 28 feet high and had been in use about ten years. Delmas had neglected to test the pole at or below ground-level prior to climbing it. He died from his injuries three days after the accident.

On August 27th, 1952, Vindice Petracco, a rope-rider employed at Michel Colliery, was fatally injured when the stone-boat in which he was riding uncoupled from the rope and travelled about 300 feet down a 40-degree raise out of control before it struck a bull-

wheel headframe. The stone-boat had been connected to the rope by a "bitch-link." Slack in the rope had allowed the link to become detached from the rope.

On December 30th, 1952, Peter Meketech, a miner employed at the Elk River Colliery, was fatally injured when his head was crushed between a post and a car. The post had been knocked out by a slab of top coal which slid from an old roadway.

Including the above-noted fatal accidents, 500 accidents involving loss of seven days or more were reported to the Department by the management of the various mines. All these accidents were investigated and reported by the District Mine Inspectors.

The following three tables classify the accidents in coal mines in 1952 as to occupation of the men involved, as to cause, and as to injury. The fatal accidents are included in the totals.

ACCIDENTS CLASSIFIED AS TO OCCUPATION

| Occupation | Number of Accidents | Percentage of Accidents |
|----------------------------------|---------------------|-------------------------|
| Underground— | | |
| Miners | 249 | 49.8 |
| Drillers and facemen | 8 | 1.6 |
| Conveyormen and muckers | 26 | 5.2 |
| Haulagemen | 71 | 14.2 |
| Trackmen and mechanics | 18 | 3.6 |
| Supervisors | 16 | 3.2 |
| Timbermen | 16 | 3.2 |
| Coal-cutters | 12 | 2.4 |
| Miscellaneous | 31 | 6.2 |
| Surface— | | |
| Shops | 11 | 2.2 |
| Surface | 25 | 5.0 |
| Preparation and coke-ovens | 11 | 2.2 |
| Miscellaneous | 6 | 1.2 |
| Totals | 500 | 100.0 |

ACCIDENTS CLASSIFIED AS TO CAUSE

| Cause | Number of Accidents | Percentage of Accidents |
|---|---------------------|-------------------------|
| Fall of ground | 144 | 28.8 |
| Fall of material and flying material | 50 | 10.0 |
| Lifting and handling equipment and material | 148 | 29.6 |
| Machinery and tools | 37 | 7.4 |
| Slipped and tripped | 79 | 15.8 |
| Falling off staging and platforms | 7 | 1.4 |
| Miscellaneous | 35 | 7.0 |
| Totals | 500 | 100.0 |

The Cumberland area is bounded on the north by the Browns River and the Trent River delineates the southern limits. Its eastern margin is the Straits of Georgia and the western boundary is the erosional edge of the Cretaceous coal bearing strata beyond which are exposed the older volcanic rocks of the Vancouver Group. (Map 5)

STRATIGRAPHY

The Upper Cretaceous strata of the Comox Group described under the term Nanaimo Series, overlies older rocks of the Vancouver Group with unconformity.

The Nanaimo strata has been subject to several classifications and these have been revised by Muller and Jeletzky (1970), following biostratigraphic zonation by McGugan (1964) and Zeletzky (ibid).

A four fold division of the Nanaimo sequence into; Comox, Haslam, Extension-Protection and Cedar District Formations, occur in ascending order, (with allowances for unconformity, or channelled, or other relationship) in both the Cumberland and T'Sable River areas.

Field work indicates that the term Extension-Protection applies to stratigraphic identities:

- (1) In the Cumberland area, north of the Trent River - conglomerates with sandstone, and shales, and shales with pebble beds of limited extent and consistent stratigraphic levels, 200 to 600 feet above the Comox Formation.
- (2) South of the Trent River in the T'Sable River area, a sequence of sandstone and conglomerates overly the Comox Formation and extend to a thickness of 800 feet or more.

The absence of Extension-Protection beds in parts of the Cumberland and T'Sable River areas, makes a division of the shale sequence above the Comox uncertain - though perhaps differences in lithology and zonation may allow for some distinction.

CUMBERLAND

CUMBERLAND AREA

33.

COMOX FORMATION

The formation consists of marine and non-marine types, with shales and coal measures. Sandstones form about 80% of the unit, and occur in thick intervals to 60 feet. In the Cumberland area, the coal measures are present in seven cyclothems which tend to be widespread. Coal seams of economic interest are in the lower part of the formation, in Cumberland and T'Sable areas. The base of the formation is marked by varied relief of 100 to 200 feet, and extremes of 300 feet. Conglomerate interbeds are recorded in lower intervals in several drill holes, but the formation lacks a continuous basal unit of the Benson type. In the Cumberland coalfield, the Comox formation is 600 to 800 feet thick, for the most part, and the range thickness 460 to 880 feet largely depends on the relief of the Karmutsen surface and degree of transitivity to Haslam. In the T'Sable area, Comox beds underlying Nanaimo Series amount to 60 to 200 feet; and to the southeast, south of Langley Lake the formation attains thickness of 250 to 700 feet.

HASLAM

This unit, consists of shales and mudstone, and in places contains few, thin beds of sandstones. Its contact with the Comox formation is marked by abrupt change of sedimentation, and in places a transition of interbedded shales and sandstones. Haslam where distinguished by overlying Extension-Protection is 200 to 300 feet thick. Elsewhere, and where mapping depends on records of drilling, the shales, Haslam and Cedar District are not separated. Therefore, Haslam is mapped only in parts of the Cumberland area, but it is considered in the T'Sable area south of Langely Lake, and south of T'Sable River.

EXTENSION-PROTECTION

The unit is mapped from exposures and records of drilling, and recognized in the Cumberland area. The beds comprise a sequence of conglomerates and sandstones, and in the upper part shales, and shales with conglomerate layers. In its fullest development Extension-Protection attains a thickness of 300 to 400 feet, present in subcrop.

NANAIMO SERIES

The term describes an assemblage of sandstones and conglomerates, - applying to outcrop and subcrop south of the Trent to the T'Sable River. Conglomerates form two or three intervals; a few shales intervals are present in the upper part. Nanaimo Series as defined here may include correlatives of the Extension-Protection, and not presently distinguished. Thickness of 600 to 800 feet can be ascribed to the Nanaimo Series. It includes about 800 feet of beds, in partial exposures at Bloedel Creek, but the upper boundary is concealed against an indicated fault.

CEDAR DISTRICT

In the Cumberland area it is continuous with outcrops which are assigned to the vancouverense zone, by Jeletzky (Muller and Jeletzky 1970). This ground is separated by faulting from outcrop and subcrop, mapped as the composite unit Haslam-Cedar District. The Cedar District consists of a sequence of shales, and shales with interlaminated siltstones; few thin beds, and passages of sandstones are recorded from drilling. It represents the youngest Cretaceous beds of the area. The combined shale sequence of Haslam-Cedar District amounts to 900 feet along the east coast.

STRUCTURAL GEOLOGY

Subsurface mapping, Figure 6, illustrates its general structure, and indicates the relief of the floor on which Comox sediments accumulated. Structures on the top and base of the Comox Formations share the same outlines. The main features: the prevailing northeast dip of about 500 feet per mile: and uplift in a salient of easterly trend passing through Cumberland.

The structure of the coalfield also includes faulting. Muller and Atchison (1971) record linear faults from plans of underground workings. Other faulting can be indicated, and much of its pattern explained by accommodation to movement on the north flank of the Cumberland uplift: the fault displacements are downthrown to the north and east. Seemingly a cross fault and branching faults close part of the Cumberland uplift on the south.

STRUCTURAL GEOLOGY CONT'D

On the west border of the area, Comox beds are downthrown against Karmutsen lavas, along a line of faulting trending northwest near Perseverance Creek. Comox outliers and fault sector are present west of this fault line on higher ground near Hamilton Lake and the Trent River. A stock quartz diorite (?) of Tertiary age intrudes Comox beds between Puntledge and Browns River, near the west border of the Cumberland area. Records of drilling nearby refer to conglomerates in the upper member of the Comox section.

D.5. Historical Sites

As early as 1836, the Hudson's Bay Company had noted Indian reports of coal deposits along the unsettled southeast coast of Vancouver Island. In succeeding years, development of these coal measures provided the impetus for settlement in the Nanaimo and Comox areas (Ormsby 1971).

Although the Hudson's Bay Company undertook the initial mining ventures, the central figure in Vancouver Island's coal industry was Robert Dunsmuir, who later became one of the wealthiest and most influential men in the province. Dunsmuir founded Canadian Collieries (Dunsmuir) Company, the principal company with coal interest on the island.

The first mine in the Comox coalfield was opened in 1875, but operated for only two years. Larger mines, eventually eight in all, began operating in 1888. The last large mine to operate in the region was located in an isolated coalfield on the Tsable River and ceased operation in 1966.

The Town of Cumberland became the prosperous centre of the mining district. Chinese mine labourers founded a separate community known as "Jap Town" on the edge of Cumberland. This was a colourful, if seemingly mysterious addition to the region. Jap Town has since been destroyed by fire and most of the residents have moved elsewhere.

Farmers and loggers later moved into the district, broadening its economic base. Union Bay prospered as the harbour and rail terminus for coal shipments. It is interesting to note that sailing ships loaded coal at Union Bay as recently as 1947 (Kelly pers. comm.).

The history of the region is closely related to the development of the coal industry. Remnants of abandoned collieries (Photo 7) reflect

the profound influence that the industry has had on the area. At present, little historical importance is given to such reminders of the past, possibly because of their relatively recent use.