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PROVINCE OF ONTARIO

DEPARTMENT OF MINES

HON. LESLIE M. FROST, *Minister of Mines* H. C. RICKABY, *Deputy Minister*

Bulletin No. 135

REPORT

ON THE

Mining Accidents in Ontario

in 1943

By

Chief Inspector of Mines: W. O. TOWER, Toronto
Inspectors: R. L. SMITH, Kenora; W. E. BAWDEN, Port Arthur;
D. F. COOPER, Sudbury; J. B. TAYLOR, E. S. LITTLE, Kirkland Lake;
E. B. WEIR, Timmins; D. P. DOUGLASS, Toronto

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To the Honourable Leslie M. Frost,
Minister of Mines.

Sir,—I beg to hand you herewith the report by the Inspectors of this Department on the accidents in the mines, metallurgical works, and quarries of Ontario during the year 1943.

I have the honour to be, Sir,
Your obedient servant,

H. C. Rickaby,
Deputy Minister of Mines.

Department of Mines,
Toronto, January, 1944.

MINING ACCIDENTS IN ONTARIO IN 1943

By

Chief Inspector of Mines, W. O. Tower, Toronto; Inspectors, R. L. Smith, Kenora; W. E. Bawden, Port Arthur; D. F. Cooper, Sudbury; J. B. Taylor, E. S. Little, Kirkland Lake; E. B. Weir, Timmins; D. P. Douglass, Toronto.

Accidents during 1943

During the year 1943 at the mines, metallurgical works, quarries, and clay, sand, and gravel pits regulated by the Mining Act there were 2,137 accidents to employees reported to the Department of Mines up to January 16, 1944. Of these, 36 were fatal accidents and 2,101 were non-fatal accidents. A survey of the industry shows that an average number of 29,477 persons were employed throughout the year.

The returns represent a decrease of 80 (3.6 per cent.) in the total number of accidents reported and a decrease of 14 in the number of fatalities recorded over the preceding year. The number of accidents involving fatalities is 34, which is 11 less than the preceding year. There were 32 accidents in which one man was killed and 2 accidents in which 2 men each were killed.

The report shows a fatality rate of 1.22 persons killed per thousand persons employed, which is a decrease of 0.26 per thousand over the preceding year and is 0.85 per thousand lower than the average for the last 25 years.

There were 71 non-fatal accidents per thousand persons employed, which is an increase of 7 (11 per cent.) from the rate of 1942 and is 24 per thousand lower than the average for the last 24 years.

The total employment figures show a decrease from 1942. This is due chiefly to decreased employment in producing gold mines. The employment of women in approved occupations on surface at certain essential operations shows an increase.

Fatal Accidents

A comparison of fatal accidents for the past five years is given below:—

Distribution	1939	1940	1941	1942	1943
Mines, underground	27	35	50	27	21
Mines, surface	3	1	2	5	5
Metallurgical works	3	2	6	5	5
Quarries	1	3	.....	5	1
Clay, sand, and gravel pits	4	1	3	3	2
Contract diamond-drilling	.....	.....	1	.....	.....
Total	38	42	62	45	34

ANALYSIS OF FATALITIES AT MINES, 1939–1943

Cause	1939	1940	1941	1942	1943
	per cent.	per cent.	per cent.	per cent.	per cent.
Fall of ground	8	34	27	43	41
Rock burst	19	5	6	8	.....
Run of ore or rock	21	20	11	14	7
Shaft accidents	16	8	13	8	4
Explosives	10	3	13	.....	15
Miscellaneous, underground	18	27	25	13	15
Surface	8	3	5	14	18

By months the fatal accidents occurred as follows:—

Month	No. accidents	No. men killed
January	4	5
February	3	4
March	5	5
April	1	1
May	1	1
June	4	4
July	4	4
August	0	0
September	3	3
October	7	7
November	0	0
December	2	2
Total	34	36

Classifying the fatalities according to industries gives the following:—

Gold mines	21
Nickel mines	5
Fluorspar mines	1
Metallurgical works	6
Quarries	1
Clay, sand, and gravel pits	2
Total	36

The comparative fatality rate per thousand persons employed at mines metallurgical works, quarries, and clay, sand, and gravel pits is as follows:—

	Persons employed[1]			Number killed			Rate per thousand
	Men	Women	Total	Men	Women	Total	
Mines[2]	19,782	360	20,142	27	.....	27	1.36
Metallurgical works	7,337	705	8,042	6	.....	6	.74
Quarries	767	.....	767	1	.....	1	1.30
Clay, sand, and gravel pits	526	.....	526	2	.....	2	3.80
Total	28,412	1,065	29,477	36	.....	36	1.22

[1]Average number for year.
[2]Includes contract diamond-drilling at mines.

The ages of the persons killed were as follows:—

17–20	21–25	26–30	31–35	36–40	41–45	46–50	Over 50	Total
3	2	2	3	8	8	5	5	36

The occupations of the persons killed at mines, metallurgical works, and clay, sand, and gravel pits are set out in the following table:—

Occupation	Men	Women	Total
Boiler fireman	1	.....	1
Chute puller	1	.....	1
Deckman	1	.....	1
Driller	8	.....	8
Drill helper	1	.....	1
Electrician	1	.....	1
Foreman	5	.....	5
Labourer	2	.....	2
Mechanical loader operator	1	.....	1
Mill man	2	.....	2
Millwright's helper	1	.....	1
Motorman	2	.....	2
Sanitaryman	1	.....	1
Smelter labourer	4	.....	4
Shaft leader	1	.....	1
Switchman	1	.....	1
Timberman	2	.....	2
Trammer	1	.....	1
Total	36	.....	36

Summary of Fatal and Non-fatal Accidents

The following table is a summary for the past twenty-five years of the number of persons injured per thousand employed at mining operations in Ontario:—

TABLE OF ACCIDENTS TO EMPLOYEES IN MINES, METALLURGICAL WORKS, QUARRIES, AND CLAY, SAND, AND GRAVEL PITS, 1919–1943

Year	Persons injured			Persons employed at all operations			Persons injured per 1,000 employed	
	Fatally	Non-fatally	Total	Producing operations	Non-producing operations	Total	Fatally	Non-fatally
1919	39	.....	.....	11,926	1,000	12,926	3	.....
1920	29	1,497	1,526	10,486	1,000	11,486	2.61	130
1921	24	1,262	1,286	8,436	1,000	9,436	2.54	140
1922	30	1,398	1,428	9,500	1,500	11,000	2.72	127
1923	30	2,120	2,150	10,500	1,500	12,000	2.5	177
1924	40	2,130	2,170	11,000	1,500	12,500	3.2	170
1925	42	2,224	2,266	11,500	1,500	13,000	3.23	171
1926	32	2,220	2,252	11,500	1,500	13,000	2.46	171
1927	33	2,244	2,277	13,311	2,000	15,311	2.1	147
1928	85	2,516	2,601	15,787	2,000	17,787	4.76	142
1929	55	2,389	2,444	17,145	1,849	18,994	2.89	126
1930	56	2,167	2,223	18,217	317	18,534	3.02	117
1931	37	1,813	1,850	17,820	447	18,267	2.03	99
1932	25	1,452	1,477	14,378	431	14,809	1.69	98
1933	25	1,514	1,539	15,080	804	15,884	1.57	95
1934	34	1,913	1,947	19,302	1,254	20,556	1.65	93
1935	36	2,048	2,084	21,444	1,528	22,972	1.57	89
1936	65	2,359	2,424	25,725	2,547	28,272	2.30	83
1937	52	2,721	2,773	28,938	3,220	32,158	1.62	85
1938	62	2,147	2,209	29,434	1,421	30,855	2.01	70
1939	47	2,246	2,293	32,444	897	33,341	1.41	67
1940	42	2,128	2,170	35,137	438	35,575	1.18	60
1941	64	2,240	2,304	35,317	618	35,935	1.78	62
1942	50	2,167	2,217	33,336	431	33,767	1.48	64
1943	36	2,101	2,137	29,083	394	29,477	1.22	71
Average	42.8	2,042	2,085	19,474	1,240	20,714	2.07	95

TABLE OF FATAL ACCIDENTS

No.	Date	Name of mine	Name of operator	Name of deceased
1	Sept. 13	Aunor	Aunor Gold Mines, Ltd.	Luigi Michielin
2	Oct. 14	"	" " " "	Jalmar Maki
3	Oct. 6	Bidgood	Bidgood Kirkland Gold Mines, Ltd.	Juho Huhtala
4	June 25	Buffalo Ankerite	Buffalo Ankerite Gold Mines, Ltd.	Joe Vrlenic
5	Oct. 20	Chesterville	Chesterville Larder Lake Gold Mining Co., Ltd.	William Demko
6	Sept. 3	Coniaurum	Coniaurum Mines, Ltd.	Andy Kotnick
7	Mar. 29	Delnite	Delnite Mines, Ltd.	Walter Boskowez
8	Dec. 6	Falconbridge	Falconbridge Nickel Mines, Ltd.	D. J. O'Connor
9	Mar. 18	Hollinger	Hollinger Consol. Gold Mines, Ltd.	A. A. Walkley
10	July 2	Frood	Internat. Nickel Co. of Canada, Ltd.	Charles Russell
11	Oct. 26	"	" " " " " "	Albert Bealer
12	Dec. 9	"	" " " " " "	Herbert F. Milks
13	May 21	Kerr-Addison	Kerr-Addison Gold Mines, Ltd.	Vital J. Vincent
14	June 11	"	" " " "	John B. Parrott
15	July 27	Lake Shore	Lake Shore Mines, Ltd.	Fred J. Lafond
16	Feb. 15	MacLeod-Cockshutt	MacLeod-Cockshutt Gold Mines, Ltd.	U. V. Ronii
17	Feb. 26	Paymaster Consol.	Paymaster Consol. Mines, Ltd.	Arni Kari Joseph Popes
18	Apr. 23	Preston East Dome	Preston East Dome Mines, Ltd.	G. D. McWhirter
19	Mar. 24	Toburn	Toburn Gold Mines, Ltd.	Anti Latvala
20	June 8	Wright-Hargreaves	Wright-Hargreaves Mines, Ltd.	Adolph David
21	Oct. 18	"	" " "	George Ojala

[1]Naturalized.

TABLE OF FATAL ACCIDENTS ON THE

No.	Date	Name of mine	Name of operator	Name of deceased
1	June 26	Frood	Internat. Nickel Co. of Canada, Ltd.	Albert Adshead
2	Jan. 6	McIntyre-Porcupine	McIntyre-Porcupine Mines, Ltd.	John J. Mortensen.
3	Mar. 19	Paymaster Consol.	Paymaster Consol. Mines, Ltd.	R. M. Van Luven.
4	July 7	" "	" " " "	Antonio Yantha
5	Jan. 24	Perry	Reliance Fluorspar Mining Syndicate.	Charles Whiteman.

UNDER GROUND AT ONTARIO MINES, 1943

Age	Occupation	Allegiance	Married, single, or widower	Cause
41	Motorman	British (nat.[1])	M	Caught in run of fill in drift.
37	Shaft leader	British (nat.)	M	Struck by fall of ground in shaft station.
47	Miner	Finnish	M	Struck by fall of ground in stope.
42	Driller	British (nat.)	M	Struck by fall of ground in stope.
43	Driller	Ukrainian	M	Struck by fall of ground in stope.
28	Driller	Jugo-Slav	M	Struck by fall of ground in stope.
41	Miner	British (nat.)	M	Struck by fall of ground in stope.
19	Drill helper	British	S	Struck by fall of ground in stope.
50	Sanitaryman	British	M	Run over by train of empty cars.
36	Motorman	British	M	Crushed when electric trolley ran into ventilation door.
38	Stope boss	British	M	Struck by fall of ground in stope.
54	Foreman	British	M	Crushed by ventilation door.
24	Chute puller	British	M	Failed to stand in a safe place while waiting for a blast.
32	Mucker boss	British	M	Crushed by large rock against broken end of grizzly timber.
31	Mucking-machine operator.	British	M	Struck by fall of ground in drift.
44	Driller	Finnish	S	Drilled into a bootleg hole containing powder.
38	Driller	British (nat.)	M	Delayed too long at blast.
47	Driller	British (nat.)	M	
18	Switchman	British	S	Crushed between car and wall.
44	Timberman	Finnish	M	Struck by fall of ground in stope.
50	Timberman	British	M	Struck by fall of ground in stope.
42	Trammer	Finnish	M	Buried in run of sand fill in substope.

SURFACE AT ONTARIO MINES, 1943

Age	Occupation	Allegiance	Married, single, or widower	Cause
38	Senior secondary boss	British	S	Run over by haulage truck at open pit crushing plant.
22	Flotation operator's helper.	British	S	Clothing caught on revolving shaft in mill.
47	Rod-mill operator	British	M	Suffocated in ore bin.
31	Carpenter foreman	British	M	Fell from roof of crushing plant.
62	Deckman	British	M	Fell in headframe from dumping deck to collar.

TABLE OF FATAL ACCIDENTS

No.	Date	Plant	Name of operator	Name of deceased
1	Mar. 4	Algoma Steel.....	Algoma Steel Corp., Ltd.....	Andrew Yule.....
2	Feb. 5	Canadian Furnace.....	Canadian Furnace, Ltd.....	Frank Hawkins...
3	July 8	Falconbridge smelter...	Falconbridge Nickel Mines, Ltd.....	Romeo Legault....
4	Jan. 19	Copper Cliff smelter...	Internat. Nickel Co. of Canada, Ltd.	Harry Pozdyk....
5	Oct. 19	" " " ...	" " " " " "	Valmore Bertrand. Albert Belisle.....

TABLE OF FATAL ACCIDENTS

No.	Date	Name of operator	Name of deceased
1	Jan. 8	Frazer Duntile Co., Ltd.....	Joseph St. Laurent.

TABLE OF FATAL ACCIDENTS AT

No.	Date	Name of operator	Name of deceased
1	Sept. 3	Consol. Sand and Gravel Co., Ltd.....	Lorne Charters....
2	Oct. 6	John Hinch.....	John Willett.....

AT METALLURGICAL WORKS, 1943

Age	Occupation	Allegiance	Married, single, or widower	Cause
45	Millwright's helper...	British.....	S	Hit by scale car in No. 4 blast furnace stock-house.
54	Electrician.....	British.....	M	Fell and broke leg; death resulted from shock and heart strain.
36	Smelter labourer....	British.....	M	Run over by empty charge train.
19	Roofman.....	British.....	S	Burned by molten matte.
38	Slagman.....	British.....	M	
27	Smelter labourer....	British.....	M	Burned by molten slag which exploded from slag pot.

AT QUARRIES, 1943

Age	Occupation	Allegiance	Married, single, or widower	Cause
39	Labourer.....	British.....	M	Buried in bin of crushed stone.

CLAY, SAND, AND GRAVEL PITS, 1943

Age	Occupation	Allegiance	Married, single, or widower	Cause
65	Fireman.....	British.....	M	Steam crane fell on him.
70	Labourer.....	British.....	S	Struck by chunk of clay and thrown against truck.

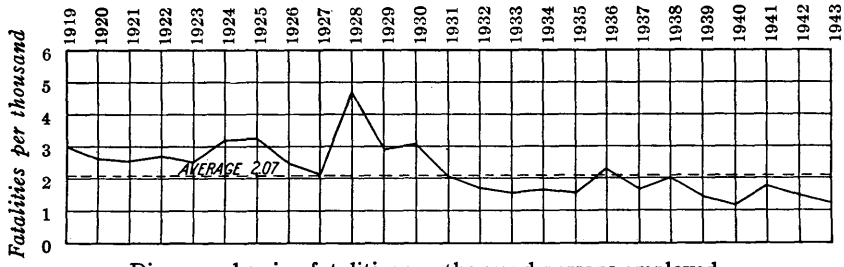

Diagram showing fatalities per thousand persons employed between the years 1919 and 1943.

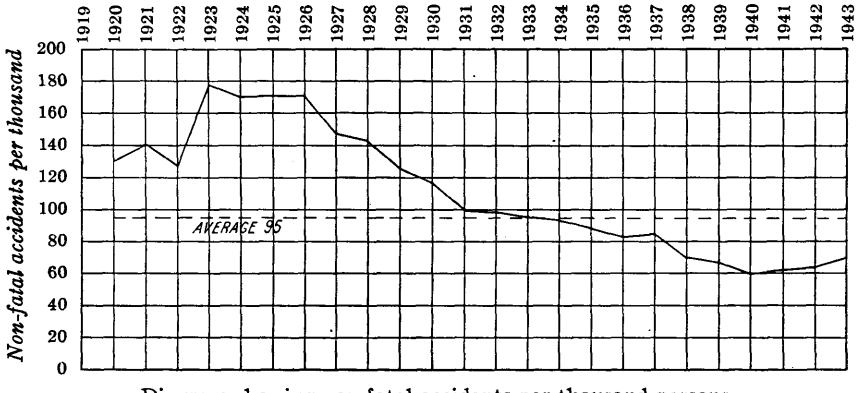

Diagram showing non-fatal accidents per thousand persons employed between the years 1920 and 1943.

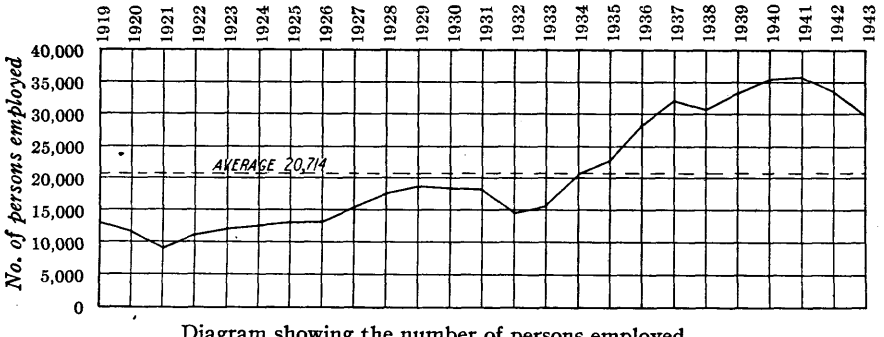

Diagram showing the number of persons employed between the years 1919 and 1943.

Non-fatal Accidents

The causes of non-fatal accidents at mines are shown in the following table:—

Cause	Surface			Underground	Total
	Men	Women	Total		
Fall of persons	85	.....	85	165	250
Crushed between two objects	30	.....	30	152	182
Falling objects	40	.....	40	105	145
Strain while lifting	38	.....	38	104	142
Flying objects, sledging, etc.	16	.....	16	91	107
Rock or ore at chute	.....	.....	.....	102	102
Handling rock or ore	5	.....	5	85	90
Fall of rock or ore at face	.....	.....	.....	78	78
Falling rock or ore, drilling, scaling, etc.	.....	.....	.....	62	62
Hand tools	25	.....	25	34	59
Machinery	29	1	30	19	49
Drilling machines	.....	.....	.....	47	47
Nails or splinters	14	.....	14	21	35
Running into or striking objects	6	1	7	26	33
Explosives	4	.....	4	25	29
Tramming	3	.....	3	23	26
Transportation	1	.....	1	21	22
Burns	19	1	20	1	21
Falls down shaft, winze, or stope	.....	.....	.....	8	8
Cage, skip, or bucket	.....	.....	.....	7	7
Rock burst	.....	.....	.....	3	3
Electricity	1	.....	1	1	2
Gas (natural)	.....	.....	.....	2	2
Unclassified	1	.....	1	.....	1
Total	317	3	320	1,182	1,502

The causes of non-fatal accidents at metallurgical works were:—

Cause	Men	Women	Total
Fall of persons	76	9	85
Falling objects	40	2	42
Crushed between two objects	49	4	53
Handling material	54	.....	54
Strain while lifting	41	1	42
Burned by slag, matte, or scrap	29	.....	29
Burns	26	1	27
Hand tools	14	.....	14
Machinery	11	1	12
Flying objects, sledging, etc.	24	.....	24
Nails or splinters	5	1	6
Transportation	2	.....	2
Electricity	3	.....	3
Gas	2	.....	2
Explosives	2	.....	2
Running into or striking objects	13	2	15
Poison	1	.....	1
Unclassified	.....	1	1
Total	392	22	414

The causes of non-fatal accidents at quarries were:—

Handling material	14	Hand tools	4
Fall of persons	9	Strain while lifting	7
Falling objects	6	Transportation	1
Crushed between two objects	6	Nails or splinters	2
Flying objects, sledging, etc.	5	Burns	1
Fall of rock	14		
Machinery	7	Total	77
Explosives	1		

The causes of non-fatal accidents at clay, sand, and gravel pits were:—

Machinery	8	Nails or splinters	1
Fall of material	5	Hand tools	1
Fall of persons	7	Falling objects	1
Strain while lifting	2		
Crushed between two objects	4	Total	31
Flying objects, sledging, etc.	2		

The causes of non-fatal accidents in contract diamond-drilling were:—

Crushed between two objects	10	Caught in feed screw	1
Caught in moving parts	9	Burns	5
Nails or splinters	9	Running into or striking objects	5
Hand tools	5	Explosives	1
Strain while lifting	8	Burns (natural gas)	2
Fall of persons	13		
Flying objects	7	Total	77
Falling objects	2		

Infection

Records show that infection followed in 87 cases out of a total of 2,101 accidents.

Location	No. of accidents	Accidents followed by infection	Per cent. infection
Mines, underground	1,182	36	3
Mines, surface	320	16	5
Metallurgical works	414	22	5.3
Quarries	77	3	3.9
Clay, sand, and gravel pits	31	1	3.2
Diamond-drilling	77	9	11.7
Total	2,101	87	4.1

Accidents from Explosives

Cause	Non-fatal		Fatal		Total	
	No. accidents	Men injured	No. accidents	Men injured	No. accidents	Men injured
Drilled into dynamite	3	5	1	1	4	6
Delayed too long at blast	4	5	1	2	5	7
Did not take sufficient cover	3	5	1	1	4	6
Fumes from blasting	1	1	.....	.....	1	1
Hit with material from diamond-drill hole	1	1	.....	.....	1	1
Dynamite exploded at collar of hole while loading	1	2	.....	.....	1	2
Detonators exploded, cause unknown	4	4	.....	.....	4	4
Returned too soon to scene of blast	3	3	.....	.....	3	3
Insufficient warning of blast	2	4	.....	.....	2	4
Fall of ground exploded detonators	1	2	.....	.....	1	2
Total	23	32	3	4	26	36

Electric Accidents

The following table shows the fatal accidents due to the use of electricity at mines, metallurgical works, and qu arries during the last ten years:—

1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	Total
.....	.....	.....	.....	.....	1	1	.....	.....	.....	2

The following table shows the total number of non-fatal electric accidents during the last ten years:—

1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	Total
4	6	4	2	8	7	3	5	6	5	50

Classification of Non-fatal Accident Rates at Producing Mines

In the following table the producing mines employing more than 50 men are arranged in order, according to their rate of non-fatal accidents per thousand persons employed:—

0–50	Omega Young-Davidson (Hollinger) Frood open pit (Frood and Stobie, International Nickel) McIntyre-Porcupine Levack (International Nickel) Lake Shore Ross (Hollinger) Wright-Hargreaves Frood mine (International Nickel) Hollinger Matachewan Consolidated Preston East Dome Garson (International Nickel) Creighton (International Nickel)
51–100	Helen (mine, Algoma Ore Properties) Magnet Coniaurum **Average—71.6 accidents per thousand persons** Falconbridge (mine and mill) Pickle Crow Sylvanite Chesterville Kerr-Addison Pamour Teck-Hughes Dome
101–150	Toburn Bidgood Hallnor Aunor Broulan Central Patricia Kirkland Lake Gold Buffalo Ankerite Berens River Upper Canada Delnite Hoyle Madsen Red Lake McKenzie Red Lake and McMarmac Paymaster Consolidated

151–200	Macassa Jerome Hasaga Leitch
201–250	Little Long Lac MacLeod-Cockshutt Hard Rock Cobalt Products Cochenour Willans
251–300	Lake Geneva

Fires

Central Patricia Gold Mines, Limited

A fire destroyed the telephone box and telephone and charred adjacent timber at the 2,170-foot loading-pocket in the shaft of the Central Patricia gold mine on the night of December 3.

There is no great amount of room at the pocket, and the telephone is only about 5 feet from the nearest chute. At 8.10 P.M. the cagetender blasted, using one stick of powder. Prior to blasting he removed the 200-watt bulb from over the chute and placed it in the telephone box for safety. There was also a sample bag and a roll of lead wire in the box. After blasting, he left to nip steel from the upper levels.

At about 8.30 P.M. the shift boss, H. Jensen, reached the 2,050-foot level station and found it full of wood smoke. He called the cagetender and together they proceeded to the pocket, where they extinguished the fire with a water-hose. A Pyrene extinguisher was handy, but was not used. As the smoke went into the main upcast it did not circulate in the mine, hence no one else was aware of the fire and no alarm was issued.

The telephone was a battery set, powered with two 1½-volt dry cells. There was an electric-light bulb on a 110-volt circuit in the box for warmth and drying. Both telephone and box were completely destroyed, making subsequent investigation difficult. The fuse on the 110-volt circuit was blown.

The origin of the fire is unknown. There may have been other more inflammable refuse in the box which was ignited by the hot bulb, or if the 110-volt wires were shorted by the blast, they may have broken and ignited the refuse.

Dome Mines, Limited

A small fire broke out in No. 12 battery locomotive on the 11th level of the Dome mine on December 3. No damage was done other than burning one board under the battery box. The fire, so far as can be ascertained, was caused by an overheated grid.

Hoyle Gold Mines, Limited

The cyanide and flotation mill of Hoyle Gold Mines, Limited, was completely destroyed by fire on July 11. The cyanide section of the mill was 86 by 86 feet; the grinding and flotation section, extending southward from the cyanide section, was 60 by 135 feet. The mill walls were built of 2-inch tongue and groove planks covered with asphalt paper and galvanized siding. The roof was double shiplap, spaced with 2- by 2-inch strips at 30-inch centres and covered with 10-year built-up roofing. The mill was treating a little over 600 tons of ore daily.

The fire originated around a 15 h.p. motor over the ore bin. This motor drove the 24-inch conveyer between the screening plant and the ore bin.

The fire was discovered by a mill shift boss who had smelt smoke and was looking for the source of it. As soon as he discovered the fire he ran from the mill to the main office, a distance of about 750 feet, to give a general alarm. In the mean time the night watchman saw smoke coming from the mill and turned in the alarm. The whistles were blown at 8.30 P.M. The flames were then breaking through the roof. The watchman had passed through the conveyer-way from the mill to the screening plant, from the screening plant to the crushing plant, and from there to the storage bins in the shaft-house, a total distance of 550 feet, and had punched the time clock at the lower end of the conveyer-way at 8.15 P.M. He reported afterward that the conveyer between the screening plant and the mill bin was carrying a heavier load than usual at that time.

The conveyer was driven by the 15 h.p. motor and 3 V-belts through reduction gearing. It is believed that the V-belts began to slip on the gear pulley. This would account for the overload on the conveyer and for the failure of the overload cut-out to shut off the power. It is believed that the V-belts finally took fire.

The mill water-supply system and the fire-fighting supply system were on the same line. The mill water-tank, of 20,000-gallon capacity, was considerably higher than the fire-pump supply tank, of 100,000-gallon capacity, outside. The smaller mill-tank overflowed into the larger fire supply tank, but by closing one valve and opening another the larger tank could be filled directly from the main supply line. These valves, however, were inside the mill, and no one remembered to adjust them until it was too late to reach them. The shift boss on duty was the man who should have started the 50 h.p. Sterling Model B4 gasoline fire pump, but when he ran to the main office others tried to start it and flooded it. When it was eventually started the fire was beyond control, and all that could be done was to stop it from spreading down the conveyer-way to the screening plant. To maintain the water supply the trestle supporting the tank in the mill also had to be saved. This much was accomplished.

On the floor where the fire started there was a barrel full of water and two fire-pails, and 50 feet of 1½-inch fire-hose.

In the screening plant 300 feet down the conveyer-way, there were 50 feet of 1½-inch fire-hose, a 2½-gallon soda-acid extinguisher, a barrel of water, and two fire-pails.

In the crushing plant, 135 feet farther from the mill, there were two hydrants with 50 feet of 1½-inch hose on each, one 2½-gallon soda-acid extinguisher, one barrel of water, and three fire pails.

Inside the shaft-house there were 50 feet of 2-inch hose and a 2-inch line to the top of the headframe, with four open sprinklers.

In the hoist-room there were 50 feet of 1½-inch fire-hose, two small "Fyr-Fyter" extinguishers, one barrel of water, and two pails.

Outside of the main buildings there were six hydrants. Five of these were equipped with 2-inch hose; the other, the No. 1 hydrant, supplied by a third water tank behind the hoist-house, was equipped with a small Viking fire-pump (type used by fire rangers) and 150 feet of 1½-inch hose and 150 feet of 1-inch hose.

The 50-h.p. Sterling pump, which supplied pressure in the hydrants, had been running at noon on the day of the fire.

International Nickel Company of Canada, Limited

A minor fire occurred in the north refuge station on the 2,200-foot level of the Frood mine about 6.25 P.M. on December 26.

A pair of gloves and some paper lying on top of an electric heater caught fire when the current was inadvertently left on during a lay-off period.

No damage resulted.

A minor sulphide fire was discovered in No. 4-10 stope, 4th level, at the Garson mine, on January 9.

No. 4-10 stope is a small shrinkage operation at the extreme west end of the mine, in which the ore flattened out rapidly as stoping progressed. It is adjoined on the east by an inclined raise from the 4th level to surface. A sublevel was driven from this raise, about 200 feet above the 4th level, to get box-hole chutes in position to pull the ore between that elevation and the surface sill. An opening was driven from the lower section of the stope to the sublevel, through which the ore pulled from the upper section could be dumped and eventually pulled out through No. 10-4 chute on the 4th level. A considerable amount of water ran into the lower section of the stope from the sublevel, and a drainage dam was built on the sublevel in November, 1942, to divert this water into the raise.

Sulphur fumes were noticed on the sublevel on January 9 and were found to be coming from the lower section of the stope. The dumping of ore on the sublevel was stopped, and intensive pulling of No. 10-4 chute was started. The ore pulled from this chute began to show signs of heat on January 13 and became really hot on January 15. The pulling operations were then suspended, the drainage dam on the sublevel was removed to let water into the stope, and brattices were built to isolate the area.

Equipment from the Mine Rescue Station was taken underground at 8.30 A.M. on January 16 and used when pulling operations were resumed. The ore was hot and steaming, but no gas or dust was encountered. The rescue equipment was used until 11 A.M., by which time the ore had become considerably cooler. Conditions were normal on January 17, and intensive pulling operations were discontinued. About 2,500 tons of ore was pulled during these operations.

A fire occurred in the sand shaft at the Garson mine about 2.20 A.M., on October 29, during contract sinking operations by the Foundation Company of Canada, Limited.

A circular shaft was being sunk through 98 feet of sand overburden and 19 feet of rock to connect with a raise from the 2nd level. It is to be used as a sand pass to supply backfill for the east ore body. The first section, from the collar to a depth of 72 feet, is 14¼ feet in diameter outside the timber. Each set consists of four 3- by 10-inch segmental rings and six posts, with an inside and outside lining. The sets are at 4-, 3½-, and 3-foot centres according to the depth of the shaft. The second section, from a depth of 68 feet to the rock surface, passes through 22 feet of water-bearing sand and consists of interlocked steel-sheet piling lined with concrete and steel. It is 9 feet in diameter outside the sheet piling, and 4 feet in diameter inside the lining.

An inflow of water was encountered about 6 feet above the rock surface during the excavation work following the driving of the sheet piling. It was found that several adjoining sheets had been overdriven after encountering the rock surface. This forced the lower end of these sheets toward the centre of the shaft and broke the joints interlocking them, thus permitting the inflow of water. A heavy concrete slab was then poured over the shaft area immediately above the sheet piling, and around a pipe 2½ feet in diameter in the centre of

the shaft. An air lock, 5 feet in maximum diameter and 11 feet in height, was subsequently coupled to this pipe just above the concrete slab. The excavation work was resumed under compressed air and completed to the rock surface on October 28.

On October 29, the midnight to 8 A.M. shift prepared to cut off the bent sheet piling about 4 feet above the rock surface with an oxy-acetylene torch. The gas cylinders were laid on top of the concrete slab, then the hoses were passed through a 3-inch pipe set in the concrete and lowered to the shaft bottom. F. Savoy and A. Belisle passed through the air lock about 1.30 A.M., and started to work under compressed air at 12 pounds pressure. J. Balko and E. Bouchard, locktenders, remained in a safety chamber cut in the side of the first section beside the top of the air lock. Savoy was using the torch about 2.20 A.M., when the tip became plugged. This was followed immediately by an outbreak of flame from the hose connections at the gas cylinders. Balko went up the manway to surface. Bouchard made an unsuccessful attempt to reach the cylinders and turn them off. He then rapped the danger signal on the air lock, waited until Savoy and Belisle had passed through it, then followed them up the manway to surface. None of the men was injured.

The shaft timber adjacent to the cylinders had meanwhile caught fire, and no water was available in the vicinity of the shaft. An attempt was made to smother the fire with sand pending the arrival of the mine fire brigade, but was not successful. The fire brigade laid 1,700 feet of hose from No. 2 shaft and extinguished the fire about 4.30 A.M.

The 2-inch inner lining and the manway from the collar to a depth of 30 feet were destroyed. The rings and 3-inch outer lining in this area were charred and the inner lining and manway below this depth were charred but remained in a serviceable condition. No damage was done to the derrick or other equipment.

Kerr-Addison Gold Mines, Limited

At about 4.45 A.M. on September 11, a small fire was discovered at the skip dump-deck of the No. 3 shaft headframe at the Kerr-Addison mine. At the moment the fire was discovered, the nearest sprinkler head blew and brought the fire immediately under control. Fire extinguishers were used to put out the last bit of fire in the headframe sheeting behind the steel column.

The fire evidently started underneath a seat which the deckman had made out of a couple of powder boxes. It was evidently caused by a short circuit or accumulated heat from a 100-watt bulb on an extension cord, which had been used under the box seat to supply heat.

Damage was negligible.

Moneta Porcupine Mines, Limited

An incipient fire was extinguised about midnight on January 13 in a frame building used as a steel shop at the Moneta mine. The fire had started in the south wall about 8 feet from the floor, above the part protected by galvanized metal. It is believed that the fire was caused by sparks, flying from a power-driven emery wheel, striking the wall.

The wall between four of the studs and one side of the roof over a slightly wider area were charred. A sprinkler system kept the fire under control and the alarm warned mine employees. Six sprinkler heads burst, one opposite the charred wall near the eave and five along the peak of the building.

Regular work had ended in the shop at 4.30 P.M., but it is thought that perhaps some of the underground workmen who came to surface for lunch may

have been sharpening tools on the emery wheel shortly before the alarm was given.

The greatest loss caused by the fire was that of a barrel of oil in a tempering tank, the oil being displaced by water. The roof where a small hole had burned through near the eave had to be repaired.

Pamour Porcupine Mines, Limited

A fire occurred in the riggers' shack at the Pamour Porcupine mine about 8.30 P.M. on February 1, the cause of which is unknown. It was promptly extinguished and did not endanger any structure at the mine entrance.

Prosecutions

Rex *vs.* J. H. Aubin
Rex *vs.* W. Lubinski

Following an incident at the Lake Shore mine on May 20, when J. C. Adamson and M. Seymour almost walked into an unguarded blast in stope No. 5,002 east, section 3, the following charge was laid against J. H. Aubin, machine runner in the stope:—

That J. H. Aubin on the 20th day of May, 1943, in the township of Teck, did unlawfully, being a workman engaged in blasting, neglect to cause all the entrances to the place where the blasting was to be done to be effectively guarded before blasting, contrary to the Mining Act, R.S.O. 1937, Chapter 47, Section 160, subsection 75 (a).

A similar charge was laid against Aubin's partner in the stope, W. Lubinski, also a machine runner.

Both men pleaded not guilty when the cases were heard on June 24, in Kirkland Lake Police Court.

Magistrate S. Atkinson registered a conviction and fine of $10.00 and costs or 30 days in each case.

Rex *vs.* C. A. Billings

Three charges were laid against C. A. Billings, vice-president and managing director of Kenwest Gold Mines, Limited, as follows:—

1. That C. A. Billings of the hamlet of Goldrock in the district of Kenora between April 15, 1943, and September 22, 1943, at the hamlet of Goldrock in the said district of Kenora, being the manager of Kenwest Gold Mines, Limited, in the said district of Kenora, on the date of the closing down of the said mine did unlawfully fail to give written notice to the Chief Inspector that the requirements of Section 157(1) of the Ontario Mining Act as to fencing of the top of a shaft, entrances from the surface, pits and openings, had been complied with, contrary to the provisions of Section 165(1)c of the Mining Act of Ontario.
2. That C. A. Billings of the hamlet of Goldrock in the district of Kenora, between April 15, 1943, and September 22, 1943, at the hamlet of Goldrock in the said district of Kenora, being the manager of Kenwest Gold Mines, Limited, in the said district of Kenora, on the date of the closing down of the said mine did unlawfully fail to give written notice to the Chief Inspector that the requirements of subsection 4 of Section 167 of the Ontario Mining Act as to the filing of plans and sections had been complied with, contrary to the provisions of Section 165(1)c of the Mining Act of Ontario.
3. That C. A. Billings of the hamlet of Goldrock in the district of Kenora between April 15, 1943, and September 22, 1943, at the hamlet of Goldrock in the said district of Kenora, being the manager of Kenwest Gold Mines, Limited, in the said district of Kenora on the date of the closing down of the said mine did unlawfully fail to give written notice to the Chief Inspector that the requirements of Rule 54 of the Rules under Section 160 of the Ontario Mining Act as to the disposal of explosives had been complied with, contrary to the provisions of Section 165(1)c of the Mining Act of Ontario.

The first of the above-mentioned charges was dropped on receipt of the required notice and satisfactory assurance that the entrances were properly protected. The second charge was also dropped on receipt of the required

plans. Billings pleaded guilty to the third charge by mail to Magistrate T. H. Wolfe, Kenora, Ont., who registered a fine of $100 and costs amounting to $16.50. The fine and costs were paid.

Arrangements were made to dispose of the explosives.

Rex *vs.* J. J. McCann

The following three charges were laid against J. J. McCann, who was dictating the policy and supplying the finances for the operation of the Trout Lake mine, and was believed by the Department of Mines to be the manager of the property:—

1. On the 21st day of June, 1943, J. J. McCann did unlawfully store blasting caps in a building on a mining property in the township of South Lorrain, of which he is the manager, such building not being suitable for the storing of the number of blasting caps stored therein, contrary to the provisions of subsection 44 of Section 160 of Part VIII, of the Mining Act of Ontario, R.S.O. 1937, Chapter 47, as amended.
2. On the 21st day of June, 1943, J. J. McCann did unlawfully fail to give written notice of completion of rope-testing requirements as required by written order of J. B. Taylor, an inspector of mines, dated at Swastika, May 29, 1943, contrary to the provisions of subsection 2 of Section 170 of Part VIII of the Mining Act of Ontario, R.S.O. 1937, Chapter 47, as amended.
3. On the 21st day of June, 1943, J. J. McCann did unlawfully fail to comply with a written order of J. B. Taylor, an inspector of mines, such order being dated at Swastika, May 29, 1943, and requiring the repairing of a powder magazine, situate on the mining property in the said township of South Lorrain, of which he is the manager, contrary to the provisions of subsection 1, of Section 170, of Part VIII of the Mining Act of Ontario, R.S.O. 1937, Chapter 47, as amended.

The first charge was heard by Magistrate S. Atkinson, in Haileybury Police Court, on July 16.

McCann's defense was that he was not the manager, but was supplying the finances only. He succeeded in this contention and was acquitted. The other two charges were dismissed on the same grounds.

Rex *vs.* M. Prpich

A charge was laid against M. Prpich, a miner, residing in South Porcupine, as follows:—

That M. Prpich did, on February 6, 1943, in 203 stope raise at the Preston East Dome mine, in the township of Tisdale, drill within five feet of a hole charged with explosives, contrary to subsection 73(b), Section 160 of the Mining Act of Ontario.

Prpich was instructed about 9 A.M. on February 6 by Shift Boss W. Jones, in the presence of D. Schmitt, captain, to reblast a hole about 7 feet in length which was fully charged with explosives. Prpich did not do so, but set up and drilled within 2 feet of the charge. He employed a lawyer and pleaded not guilty. An attempt was made to prove that much time would have been lost waiting for smoke to clear out of the stope.

The case was heard before Magistrate S. Atkinson, in South Porcupine, on February 23. Prpich was found guilty and fined $10.00 and costs, the latter amounting to $10.55.

Rex *vs.* Richmount Prospecting Syndicate

Following the finding of explosives at an abandoned property, a charge was laid by the Royal Canadian Mounted Police against the Richmount Prospecting Syndicate of having explosives at their property at Ess Creek, Ont., without a valid permit, contrary to the War Measures Act, P.C. 2,903, Section 15.

The case was heard before Magistrate W. Cooper on September 29, 1943, in Sudbury. The counsel for the defence entered a plea of "guilty." After hearing the evidence the magistrate declared the defendant guilty, but stated

that in his opinion the onus and blame for the offence appeared to rest on W. J. McNeely rather than on the other members of the syndicate, as it seemed that he had been left in full charge and had accepted the responsibility for the necessary supervision of the property. A fine of $50.00 and costs amounting to $15.50 were levied.

Rex *vs.* C. Salo
Rex *vs.* W. Fors

A charge was laid against C. Salo, a driller at the Central Patricia mine, as follows:—

That C. Salo of the hamlet of Central Patricia in the district of Kenora (Patricia portion) on or about the 8th day of April, 1943, at the hamlet of Central Patricia in the said district of Kenora, did unlawfully drill a hole within six inches of the remnant of a hole that had been charged and blasted, contrary to the provisions of Section 160, subsection 73a, of the Mining Act of Ontario.

A similar charge was laid against W. Fors, a driller at the Central Patricia mine.

The cases were heard before Justice of the Peace R. E. Barrett on May 25. Both men pleaded guilty, and a fine of $10.00 and $7.50 costs were imposed in each case. The fines and costs were paid.

Rex *vs.* Eli Timber

A charge was laid against Eli Timber, a driller at the Leitch gold mine, as follows:—

Eli Timber, on or about April 29, 1943, at the Leitch gold mine near Beardmore, in the district of Thunder Bay, being a driller in the said mine, did unlawfully drill within five feet of a hole containing explosives contrary to Section 160, subsection 73b, Part VIII of the Mining Act of Ontario.

On August 13, at Geraldton, before Magistrate Le May, Eli Timber pleaded guilty to the above charge and was fined $25.00 and costs.

Mine Rescue Stations

During the year normal activities were carried out at the three mine rescue stations at Timmins, Kirkland Lake, and Sudbury. Fifty-one fully trained rescue teams were maintained: 21 teams at Timmins, 14 teams at Kirkland Lake, and 16 teams at Sudbury.

Voice Powered Telephone

The "Voice Powered Telephone" incorporated in the Burrell gas mask was added to the mine rescue equipment in Ontario by the Ontario Department of Mines in the early part of 1942. This has made an important advance in mine rescue equipment available to the mining industry of Ontario. Complete sets with approximately 1,000 feet of 2-conductor, No. 18, type "S" neoprene-jacketed cable are located at the mine rescue stations at Sudbury, Timmins, and Kirkland Lake.

Tests carried out at the Frood mine in 1941 over one mile of line were successful, reception being clear and distinct. The limit of transmission for this equipment is from 3 to 4 miles, as stated by the manufacturer.

The telephone does not take the place of a life-line with oxygen-breathing apparatus but is intended for use in operations where the All-Service gas mask is suitable. It provides two-way communication between one or more wearers of masks and someone at the fresh-air base. A special portable cable-reel has

been made up so that the cable can be payed out as an advance is made into the danger area; this is carried by members of the rescue squad.

The operating principle of the telephone equipment is quite simple, no batteries or outside power of any kind being required. The voice, which is the source of power, produces sound waves which are directed against a very sensitive diaphragm, which is coupled to a magnetic armature balanced between two magnetized pole pieces. These waves cause fluctuations in the magnetic circuit of the telephone instrument. A coil surrounds the armature but provides sufficient clearance so that the armature can vibrate. Sound waves, striking the diaphragm, cause motion that is transmitted to the armature, varying the magnetic reluctance and developing a flux which creates a small current in the coil. This current is transmitted through the line to the receiver instrument, which, by means of a similar process, converts the current into sound.

The tone is remarkably clear and true. The receiver on the mask fits comfortably over one ear and gives a high degree of reception, even when surrounding noises are loud, a valuable feature in emergency or rescue work.

Summary of Rope Tests, 1943

The following is a summary of the tests made in the Wire Rope Testing Laboratories of the Department of Mines during 1943:—

Tests for Ontario mines under Act	549
Special informative tests	92
Tests for wire-rope manufacturers	29
Tests for mines outside Ontario	45
Other tests	7
Total	722

Fatal Accidents

MINES

Aunor Gold Mines, Limited

Luigi Michielin, aged 41, a naturalized British subject, born in Italy, with wife and two children residing in Italy, employed as motorman at the Aunor mine, was killed at about 6.20 P.M., on September 13, when his skull was fractured in some manner while he was trying to escape from backfill and water running from No. 602 waste-pass raise. Michielin was employed at the Aunor mine on October 20, 1940.

No. 602 raise was driven 6 by 14 feet at approximately 60 degrees from the 3rd or 625-foot level to the surface. It was first planned to serve as both an auxiliary exit and as a fill raise. The only work on the 250- and 500-foot levels to date is 28 feet and 110 feet of crosscutting, respectively, but neither of these crosscuts is connected with No. 602 raise. The raise was broken through to surface about the middle of June, 1942. Fill raises to serve the 750-, 875-, and 1,000-foot levels were driven between levels from the 1,000-foot level to the 625-foot level. Each raise tapped into the one above at points 14 to 23 feet above the levels. Loading chutes were built to serve the level below, and control chutes for the fill raise were built at each level. The loading chute to serve the stopes on the 750-foot level was at the bottom of No. 602 raise, on the 625-foot level, on the west side of No. 602 crosscut, 320 feet south of the shaft station. The control chute on the 625-foot level was in a 13-foot heading driven west from No. 602 crosscut, 21 feet south of the loading chute. The control chutes

and loading chutes were built between vertical posts, and muck flow was controlled with planks.

During the winter of 1942–43, it was found almost impossible to maintain the timber dividing the raise into waste-pass and manway. Approval to abandon the manway as an exit was granted on March 1 by the Department of Mines. The removal of the manway from all but a short section at the top was completed, and the use of the raise as a waste pass was resumed about the first of August. The last fill dumped prior to the accident was on August 24 and filled the raise to the top. The fill used was rock from waste dumps on the Mace property, and mixed with this was an appreciable amount of sand and gravel.

The capacity of the raise was 3,300 tons. On September 4, the muck level in the raise was measured, and the amount of fill then was about 2,400 tons. The last time the raise had been pulled before September 13 was on August 31.

At 3 P.M. on September 13, Michielin and his helper, H. Fulham, went to the 625-foot level to pull waste for the 750-foot level stopes. They pulled six cars from the loading chute, which ran empty. Later they ran a few tons through the control chute, and it ran empty. About 5.30 P.M. they telephoned T. Bunce, the mucker boss, and told him the raise was hung up. He said that he would bring powder to blast. Bunce arrived about six o'clock and found the motor crew eating lunch at the station. When they went in to the raise they found some muck had fallen into the loading chute. This was sticky material, believed to be drill sludge and fines washed from the broken rock. This muck was pulled and filled one car. The control chute was still empty. The train of four cars was then pushed north toward the shaft by the battery locomotive to a point 20 feet past the loading chute. The planks were put in closed position in the chute and the three men were preparing to blast when the muck dropped. Muck began to flow first, according to Bunce and Fulham, from the control chute and they all ran to get away. Fulham, who was nearest the motor, jumped on to it and climbed over it and over the full car next to the motor and into the second car. Bunce, who was next closest to the motor, jumped on it, took the driver's seat, and drove the train out to the station. The train crashed into the shaft door and the two centre cars of the train were derailed. Bunce rang nine bells, after which the two men climbed to the 500-foot level station. There was water from the raise at the 625-foot station when they left it.

What happened to Michielin is not known. On the night of the accident, Bunce said he saw him last running along about 10 feet behind the motor, about half way between the raise and the shaft. The following day he stated that he thought he was riding on the motor beside him, and although he did not see him there he thought he felt his body. At the inquest he swore that Michielin was sitting on the railing around the motor cab, facing back toward the raise, and when the train reached the station he just wasn't there. Fulham could not recall seeing him after he himself jumped on the train.

The Aunor shaft-sinking crew was on the 1,000-foot level station at the time of the accident. They were the first men to go to search for Michielin. A. McPherson, shaft leader, found him lying on his back with his feet toward the shaft, in a narrow space between the east side of the motor and a timber truck at the side of the track. He was not tangled with either motor or truck. There was scarcely any muck on top of him. He was taken to surface and examined in the dry-house by Dr. Hope. At the inquest the cause of his death was described as a fracture along the right side and back of the skull. The doctor thought this had been caused by an object with a rounding surface. The only other visible injury was a small cut on the right forearm.

Investigation following the accident revealed that all the fill had run out of the raise. This was about evenly distributed on the 625- and the 750-foot levels. The loading chute in No. 602 crosscut was torn out. The muck on the 625-foot level was less than a foot in depth at the north end of the station. It was about a foot and a half in depth where Michielin was found, and from this point it increased to where it filled the crosscut within a few inches of the back, about 110 feet south of the shaft. From here to 180 feet beyond the raise, a total distance of 390 feet, the crosscut was filled within a few inches of the back. The muck flowed over about 800 lineal feet of crosscuts and drifts on the 750-foot level, partially filling them. The drift in which the loading-chute was located was nearly filled. The loading-chute on the 750-foot level, through which the muck on this level flowed, was not broken. Very little muck remained in the raise between the 750- and 625-foot levels.

After the accident, the rate of flow of water from the raise was measured and this was found to be five gallons per minute. When the raise was first driven water was encountered from 107 to 126 feet above the level. After the raising was completed this area was grouted with 76 bags of cement, which were pumped into three diamond-drill holes. Four more bags were pumped into a vertical hole from the level. When the manway was removed 36 more bags were used in grouting four wet places. The amount of water which evidently accumulated in the raise was small in comparison with the amount of fill in the raise. The water line on the 625-foot level was broken, and some water flowed from it. On September 14 about 76 buckets of water were bailed from the shaft; the average for the first thirteen days of the month had been less than fourteen. The depth of water was about 12 feet when work was resumed in the shaft on September 14.

An inquest was held by Coroner H. L. Minthorn, M.D., in Timmins at 3 P.M., September 30. The jury returned the following verdict:—

We, the jury, find that Louis Michielin came to his death September 13, 1943, at the Aunor mine in a run of muck from back filling raise on the 625-foot level. Death was accidental, no blame attached to any person or persons.

Jalmar Maki, aged 37, a naturalized British subject of Finnish birth, married, with one child, employed as a shaft leader, received fatal injuries when struck by about four tons of falling rock at 7 P.M. on October 14 at the 1,750-foot level station of the Aunor mine. Maki died an hour later just after being admitted to the Porcupine General Hospital.

Deepening of the 3-compartment Aunor shaft below 1,580 feet was begun on August 2. The rock is a talc-chlorite schist. The outside dimensions of the shaft timber are 6 feet 8 inches by 18 feet. An auxiliary manway at the north end is also carried, increasing the length about 4 feet. On October 14 the bottom of the shaft was 3 feet below the 1,750-foot level station. The station set was 18 feet 10 inches high. From this height the station roof sloped down at about 34 degrees to the face of the station crosscut, which was 12 feet high and 22 feet wide. The station roof was timbered for a distance of 7 feet from the shaft timber with two 12- by 12-inch spruce cap timbers, the ends supported by four 6-foot pins in the north and south walls of the station and blocked with lagging on a double covering of 3-inch plank. The 7 A.M. to 3 P.M. shift completed the drilling of the 12- by 22-foot station face with 31 holes and then blasted the cut (12 holes) with 84 sticks of powder at 12 noon. At 1.45 P.M. they blasted the lower 8-foot portion of the breast with 196 sticks of powder in 34 holes, leaving two rows (24 holes).

The 3 P.M. to 11 P.M. shift, consisting of six men, scaled for half an hour at the beginning of their shift. They then mucked 39 buckets (1-ton capacity) after which they went up to the 1,000-foot level station to eat lunch. They decided to load and blast the two remaining rows of holes before removing any more muck. Five men, Maki, P. Power, L. Laronde, J. Trepannier, and L. White, proceeded to do this. The sixth man was left on the 1,000-foot level. The muck pile was about 6 feet high under the collars of the holes. When the accident occurred Maki was standing just at the edge of the centre part of the breast passing primers to Trepannier and Power at the south end of the breast and to Laronde and White at the north end.

Without any warning a block of rock weighing about four tons fell out of the unblasted portion of the breast. The block was pyramid-shaped with a three-sided base. The front side of the base extended across 10 feet of the still remaining breast with the two faces forming the upper or back sides meeting the base just short of the new face, six feet ahead, and tapering to the apex of the pyramid at the top and front of the old face. The two inside faces where the rock let go were well-defined shear planes. The rock broke up and rolled down the muck pile, striking Maki and rolling over him. Some of it came to rest on his legs. The men at each end of the breast were clear of the falling rock.

A post-mortem examination was conducted by Dr. Paul. Maki's injuries were: compound fracture of upper third of left femur; fractures of middle and lower thirds of right femur; fracture of eighth left rib; ruptured spleen; contusion of stomach wall; fracture of tenth thoracic vertebra. The primary cause of death was the injury to the back.

An inquest was opened before Coroner F. C. Evans in Timmins at 4 P.M., October 25, but owing to the absence of the Crown Attorney the inquest was adjourned immediately after swearing the jurymen to office. The inquest was resumed at 8.15 P.M., November 9. The jury returned the following verdict:—

We, the jury, hereby declare from the evidence submitted that Jalmar Maki of Timmins, Ont., met his death at the Aunor mine by fall of rock on the 14th day of October, 1943, accidentally, no blame attached to anyone.

Bidgood Kirkland Gold Mines, Limited

Juho Huhtala, aged 47, Finnish, married, employed as a miner at the Bidgood Kirkland mine, was killed instantly about 10.40 P.M. on October 6 by a fall of rock in No. 1,212 shrinkage stope on the 1,275-foot level. Huhtala was employed at the Bidgood on August 27, 1935. He had previously worked at the Wright-Hargreaves mine. He is survived by his wife, two sons, who are also employees at the Bidgood mine, and two other children at school.

No. 1,212 shrinkage stope was started on a 268-foot length of ore, 4 feet in width, striking east and west and dipping about 66 degrees to the north. In this area there are 14 chutes spaced about 22 feet apart. These are numbered from the east end. There are three manways: No. 1 at the west end of No. 3 chute, No. 2 at the east end of No. 7 chute, and No. 3 at the west end of No. 11 chute. Mining in the 60-foot section from the west end of the stope to No. 3 manway was discontinued when the stope was up about 55 feet. When the stope was up about 62 feet a pillar of low-grade ore was left over No. 4 chute. This separates the areas served by No. 1 and No. 2 manways. The accident occurred in the area between this pillar and No. 2 manway, where the muck is pulled through chutes Nos. 4, 5, and 6.

On September 28, No. 5 chute became hung up. At this time the stope back from No. 6 chute to the east side of No. 5 chute was 120 feet above the

level. East of this as far as the pillar, the back was 5 feet higher. The dip of the vein had decreased about 6 degrees some 70 feet above the level. The width was the same, that is about 4 feet. When the muck hung up, a staging was built on 5-inch sprags, 7 feet below the back, to make a safe walkway and also to serve as a drilling stage.

Between September 28 and October 6, when the muck finally dropped, approximately 150 tons were pulled from the No. 5 chute. Although No. 4 and No. 6 chutes were not hung up, some muck was also pulled from them to help break down the hung-up muck. When the muck finally did drop it left a depression about 30 feet in depth and a nearly vertical face of muck directly over No. 5 chute. This was the condition when Huhtala and his helper, A. Quinn, went on shift at 4 P.M. on October 6. They were instructed by the shift boss, L. Whittaker, who examined the stope at the beginning of the shift, to break down the steep muck pile.

At 10.40 P.M., the pile had been mucked down so that the men could walk down the slope. The workmen had used a safety-belt and rope up to this time, one man holding the rope while the other picked down the pile. Huhtala then took off his belt and told Quinn to go up on the staging and release the rope. Quinn was on the staging when a slab 31 feet long fell from the hanging wall. This slab varied in thickness from 6 feet at the upper west end to a thin edge at the east end. The thickness decreased from top to bottom and the depth increased from east to west. The lower limits could not be seen after the accident as they were hidden by the hundred odd tons that fell, but the depth probably ranged from 7 or 8 feet at the west end to a maximum of 15 feet near the east end. The sprags supporting the staging on which Quinn was standing were hitched in about a foot below the upper edge of the slab. When the sprags gave way Quinn fell about 12 feet but suffered only an abrasion on one shin. The slab broke into numerous pieces. Huhtala was caught about 10 feet from the west end and was buried under comparatively small broken pieces. The slab came away from jointing planes in the diorite hanging wall. These planes had a thin coating of calcite and gouge. The mucking-down of the rock pile had removed the last of the support. The slab had not appeared loose at any time. Quinn gave evidence that Huhtala sounded the hanging wall repeatedly as they mucked down.

Huhtala's body was removed about 11.30 P.M. He was pronounced dead by Dr. Thomson before being removed to surface. His injuries included crushing of the face and skull and fractures of all the ribs, pelvis, and both legs. The attending doctor stated that his death would have been instantaneous.

An inquest was held before Coroner R. W. McBain, M.D., in Kirkland Lake, at 8 P.M. on October 13. The jury returned the following verdict:—

We, the jury, find that the accident which happened at the Bidgood mine on October 6, 1943, at the hour of 10.40 P.M., causing the death of Juho Huhtala, was accidental, caused by a fall of rock through no fault of anyone concerned.

Buffalo Ankerite Gold Mines, Limited

Joe Vrlenic, naturalized British subject, born in Jugoslavia, aged 42, married, with three children, employed as a machine runner at the Buffalo Ankerite mine, was killed instantly on June 25 at 1.10 P.M. by being crushed by a chunk of ore, weighing about two tons, which fell in one piece from the back of No. 1,404 slice-and-fill stope when he was starting a hole in it with a stoper drill.

Vrlenic had worked at the Buffalo Ankerite since March 6, 1942. He had

seven years' experience prior to this date and had worked last at the Teck-Hughes mine. His partner was A. Puscus, also a runner, who had been employed at the Buffalo Ankerite mine since 1932.

Nos. 1,404, 1,405, and 1,406 stopes on the 1,400-foot level form a continuous stope 1,000 feet long. The average width of the No. 1,404 section, at the east end of the three stopes, is about 11 feet. The dip of the vein in the stope is about 52° N. The back of the stope at the point where the accident occurred was 60 feet below the 1,250-foot level, and the width was 9 feet. The intermittent slice-and-fill system of mining is used. The breasts are drilled with stoper drills.

On the afternoon shift of June 24 two breasts were blasted at the end of the shift. On the day shift of June 25, Vrlenic and Puscus scaled until near lunch time. After lunch at about 1.10 P.M., Vrlenic was starting his fourth hole and Puscus was finishing his fourth hole. The two men were drilling about 10 feet apart. Both machines were running when about two tons of ore fell from the back, breaking the starter steel in Vrlenic's machine and crushing him under it. The piece of ore was approximately 30 per cent. quartz. In plan it was nearly square, measuring about 5 feet 3 inches each way. It was 18 inches thick in the centre and thinned out from the centre toward all four edges to about 4 inches. The only slip or slickenside bounding the piece was along the south or footwall edge. The piece extended across the back from 3 feet above the footwall to 6 inches from the hanging wall. Vrlenic's first three holes were drilled along the footwall.

Puscus at once notified two men working 350 feet farther west in No. 1,405 stope. They in turn notified others, including Shift Boss Chas. Corlett, who was then making his second inspection of the stope from east to west. Corlett had spoken to Puscus only a few minutes before the accident and had looked up at Vrlenic from the foot of the muck pile. Vrlenic, without stopping his machine, had nodded his head to indicate that everything was all right.

Vrlenic was released in about 20 minutes. His injuries included fractures of both legs, ribs, neck, and skull and internal injuries.

An inquest was held before Coroner Frank Evans at South Porcupine at 7.30 P.M., July 6. The jury returned the following verdict:—

We, the jury, find that Joe Vrlenic came to his death on Friday, June 25, 1943, about 1.15 P.M. at the Buffalo Ankerite Gold Mines, Limited, in the township of Deloro, in No. 1,404 stope by a fall of loose rock, death being accidental.

Chesterville Larder Lake Gold Mining Company, Limited

William Demko, machine runner, was instantly killed in No. 7C1 stope of the Chesterville mine at 10.40 A.M. on October 20, when he was struck by a fall of rock.

Demko, a Ukrainian, aged 43, married, with no children, had been employed at the Chesterville mine since 1939.

No. 7C1 is a shrinkage stope 190 feet long, averaging 50 feet in width. The ore pulls through 12 draw openings into a scraper drift, where it is scraped into a pocket or box-hole from No. 702 West drift.

The stope sill is 35 feet above the rail of No. 702 West drift. Entrance to the stope is effected through a raise to the 6th level; this raise is 110 feet from the west end of the stope. East from the raise the back is flat and is 45 feet above the stope sill. West from the raise there is a rill of three breasts; the height of the low, flat back is 25 feet above the stope sill, and the low breast is 60 feet west of the raise.

Two crews were employed on the morning of October 20 in No. 7C1 stope, both on the low breast. W. Demko and J. Rouleau were to drill the south half and Martin Burns and N. Andrechuk the north half. Both crews scaled till about 10.30 A.M., at which time the shift boss, V. Pedersen, and the safety inspector, H. Tough, visited the stope. The opening under the bottom breast was plugged for a distance of 15 feet from the south wall. There was sufficient space for a man to get under the breast for its remaining length.

At about 10.40 A.M. Demko went below the breast to work down the broken muck on the south side. He sounded the back over his head and commenced to pry down the broken muck, which, caught by the brow of the breast, was standing very steeply.

Rouleau was standing about 10 feet southeast of Demko. He was part way up the muck pile and able to see the back above Demko's head up to the breast. Where Demko was working the back was about two feet over his head. Burns and Andrechuk at this time were gadding a loose piece near the north wall and did not see the accident.

As Demko worked on the muck pile, a slab fell from the back, the north margin of which crushed him. This slab extended 10 feet west from the brow; it was 7 feet wide at the brow and 4 feet at the west end. It averaged about 10 inches in thickness. Apparently it had been supported at its west end by the broken muck. It was broken into two pieces by the fall.

Demko was killed instantly. His body was released at 11.30 A.M. He was found to have suffered the following injuries: pulmonary haemorrhage, fractured skull, fracture of the right jaw, and numerous bruises and lacerations. Death was ascribed to pulmonary haemorrhage.

An inquest was held on October 28 in Larder Lake Municipal Hall before Coroner R. W. McBain, M.D. The jury returned the following verdict:—

We, the jury, find that William Demko, from the evidence submitted, came to his death in 7C1 stope of the Chesterville gold mine, Larder Lake, at 10.40 A.M., October 20, 1943, by a fall of rock casuing multiple injuries and instant death.

Coniaurum Mines, Limited

Andy (Andrej) Kotnick, Jugo-Slav, aged 28, married, machine runner, was crushed to death in the Coniaurum mine, about 1.15 P.M. on September 3, when a slab of rock weighing about three tons fell and caught him while he was scaling. Kotnick is survived by a wife and a daughter 19 years of age, both of whom reside in Jugoslavia.

Kotnick was employed at the Coniaurum mine on August 6, 1935. He was made a runner about five years ago. At the time of the accident he was working in No. 34SH slice-and-fill stope on the 4,000-foot level with Dominic Campagne, his helper. This stope is worked on one shift only. Breast-drilling with leyner drills was proceeding from east to west. The mucking-floor under the breast was 86 feet above the 4,000-foot level track; the fill behind the breast was 10½ feet higher. The breast was only about 6 feet high. The vein in this part of the stope had an average dip of about 45° N., but under and for about 35 feet ahead of the breast it rolled flatly to the south at a height of about 5 feet above the mucking-floor. The result was that the breast was not over the mucking-floor at all but was half over the bench formed by the roll; the rest was in the south wall and was slash ore.

On September 2, Kotnick blasted the second breast west of the fill barricade with 27 holes. This blasting knocked out a set of timber (two posts and cap) 12 feet ahead of the new breast or 22 feet ahead of the barricade. The previous

blast had knocked out a set 14 feet ahead of the barricade. Both of these sets had been erected with short posts on the bench and long posts on the mucking-floor.

On the morning of September 3, Kotnick scaled behind the breast until about a quarter to eleven. The muck being too high to set up the machine, they commenced to scrape muck to the No. 5 mill-hole, 25 feet ahead of the breast. They found that the sheave was not in a good position to move the muck, so after scraping for about fifteen minutes, they stopped, ate their lunches, and decided to drill a hole for the sheave eye-bolt under the breast and move the sheave to this new position. Their air line was too short for this. Campagne went back on top of the fill to put on another length of pipe. While he was doing this, Shift Boss P. Lessard entered the stope. When he went down under the breast he saw that Kotnick was working under loose ground, and he instructed him to scale it down.

Kotnick started to scale near the north wall over the bench. As he was scaling a piece about 7 by 3 feet, Lessard, who standing about 4 feet behind him, told him to watch the south wall because it was loose. Just as he spoke Kotnick scaled down a small slab and immediately a larger slab, weighing about 3 tons, fell from the wall and back. This slab partially overlapped the slab Kotnick scaled down. Both men jumped. Lessard got clear, but Kotnick fell and, as the slab fell over towards the north, the north edge fell across his back pinning his chest against another rock.

Lessard and Campagne tried to release him but were unable to do so alone. Campagne summoned other help while Lessard continued to work. On the arrival of more help Kotnick was quickly released. He was examined by a doctor on the level after removal from the stope.

Kotnick had died almost instantaneously, death being caused by crushing injury to the chest. His left ribs were broken in two places, and his right ribs in several places. His right leg was also fractured.

An inquest was held before Coroner Frank Evans at Schumacher at 4 P.M., September 27. The jury's verdict was:—

We, the jury, summoned to enquire into the death of Andrew Kotnick on September 3, 1943, at Coniaurum Mines, Limited, find that death was due to injuries received when struck by a fall of rock while scaling in 34 SH stope, 4,000-foot level. We find that death was accidental with no blame attached to anyone.

Delnite Mines, Limited

Walter Boskowez, a miner, aged 41, a naturalized British subject of Polish birth, married, with wife and two children residing in Poland when last heard from at the outbreak of war, was killed instantly by a fall of ground in No. 817-1 West stope on the 875-foot level of the Delnite mine, about 9.30 A.M. on March 29.

Boskowez was working with R. Emond. Both were experienced miners. Boskowez had worked thirteen years at the O'Brien mine, fourteen months at the Omega and some time at the Paymaster and had been employed at the Delnite since September 16, 1941. Emond has worked fourteen years in various mines.

Boskowez and Emond were mining the sill pillar in No. 817-1 stope. The stope is a section 110 feet long in a 700-foot section of ore on the 875-foot level, on "C" vein. The chute of ore has been nearly all mined out from the 1,000-foot level to about 75 feet above the 500-foot level, the remaining ore in this area consisting for the most part of sills and a few pillars; about half of the sills at the four levels above the 1,000-foot have been mined. Broken ore remains in the stopes above the 500-foot level. The stopes on the 625-foot level have been

scaled empty and about half the stoped area here has been filled. On the 750-foot level the stoped area is 725 feet long on the level. Most of the broken ore has been withdrawn from this area and a section 187 feet long in the centre of the stoped ore has been filled to the 725-foot level. No. 817-1 West stope is situated below this filled area, as is also the east half of No. 817-2 West stope. These two stopes are separated by a manway.

No. 817-1 West stope and No. 817 East stope, which lies to the east of it, were both mined up to the sill and then scaled empty and filled with all the broken rock that would run through one raise in the east stope and a raise at each end of No. 817-1 West stope. This left a depression in the fill in No. 817-1 West stope, which was bridged over with a floor laid on stulls. After starting to mine the sill the stope crew broke the floor twice and was transferred to another stope. Work on this sill was suspended until Boskowez and Emond completed the sill in No. 817-2 West stope where they were working. On March 19 two timbermen were sent to No. 817-1 West stope to scale and repair the broken floor. They worked there on the 19th, 22nd, and 23rd. On the last date Boskowez and Emond started mining in the stope, and continued to drill and blast each day for the balance of the week to March 27. During these five days they drilled 53 holes and blasted 56 holes; on the 27th they blasted 10 holes. The breast was being carried from west to east, and the blasting on the 27th brought it to a point 40 feet from the east end of the stope. For a distance of 40 feet behind this breast the thickness of the pillar averaged 11 feet; then for 13 feet to the west end of the pillar the thickness was about five feet less.

On the morning of the 29th, Boskowez and Emond entered the stope by the west end and were still scaling when R. Moore, mine superintendent, visited the stope about a quarter past nine. Boskowez was then scaling about 25 feet from the west end of the pillar or 12 feet east of the 5-foot breast. Moore started to go down under this breast along the hanging wall, and Boskowez told him to come down by the south wall because the back was loose. Moore sounded the back with his hammer and asked the workmen if they had scaling gads. They said they had. Before leaving he told them to take the loose down if possible and, if they could not get it down, to drill at the west breast where they would not have to go under it. Boskowez did not get the loose down. He prepared to drill at the west breast by putting in a horizontal piece of lagging under the loose to carry staging planks, the other ends of which were to rest on the muck.

Boskowez asked Emond to go to the level for some wedges. As he was doing this Emond heard the loose rock fall and when he went back he found Boskowez under it. About four tons of rock had fallen, and much of it was broken up into fairly small pieces. Boskowez was under one of the larger pieces; his broken neck and skull fractures indicated that he had been killed instantly.

An inquest was held before Coroner H. L. Minthorn, M.D., in Timmins on April 2. The jury returned the following verdict:—

> We, the jury, have decided on this, the second day of April, 1943, that Walter Boskowez met his death accidentally through no fault of anyone, on March 29, 1943, at 9.15 A.M. approximately, on the 875-foot level, in stope 817-1 of the Delnite mine.

Falconbridge Nickel Mines, Limited

Donald J. O'Connor, British, aged 19, single, employed as a shoveller and drill helper at the Falconbridge mine, was instantly killed about 1.30 P.M. on December 6 by a fall of ground in No. 502-82-91 stope on the 500-foot level.

This horizontal cut-and-fill stope is about 450 feet in length and is above the main east drift. The drift was slashed to a height of 16 feet over the width

of the ore body and timber installed with the stope flooring 11 feet above the drift floor. Chutes were built at 25-foot centres and numbered from west to east. The first cut over the timber was being mined eastward at the time of the accident, with the breast midway between Nos. 9 and 10 chutes. The stope was 10 feet wide at No. 9 chute and 18 feet wide at No. 10 chute.

On December 6, O'Connor assisted the stope boss, P. K. O'Brien, to finish drilling a 19-hole round in the breast, which they had started on the previous shift. They blasted the round in two sections between 10 A.M. and 11.30 A.M., then had lunch. O'Brien scaled the breast on returning to the stope about 12.30 P.M. He found that the muck pile was jammed against the brow and was too high for him to set up for another round. G. Lennon, V. Legatz, and J. Richards, were raising the No. 1 chute timber. He instructed Lennon and O'Connor to scale the back ahead of the breast and bar down the muck pile. They entered the stope through No. 11 chute. Lennon sounded the back and found drummy ground between the brow and No. 10 chute but was unable to scale it down. O'Connor then tried to dislodge a large slab from the muck pile underneath the brow. When he succeeded in moving it with a long bar, the drummy ground fell from the back and caught him under the eastern end. A piece weighing about 1,200 pounds had to be lifted from his head before he could be moved.

An inquest was held by Coroner P. E. Laflamme, M.D., at Falconbridge on December 14. His verdict was as follows:—

Donald J. O'Connor, age 19, employed as a shoveller and drill helper by the Falconbridge Nickel Mines, Limited, was instantly killed about 1.30 P.M. on December 6, 1943, by a fall of loose rock in No. 502-82-91 stope on the 500-foot level. From evidence given, Stope Boss P. O'Brien had instructed the deceased and G. Lennon to scale the back ahead of the breast and bar down the broken rock which was piled up against the brow. The breast had been blasted that morning. Lennon sounded the back and found an area of drummy rock immediately ahead of the breast. He tried without success to scale it down. O'Connor then picked up a long bar and started to pry at a large slab of rock which was jammed under the brow. One end of the drummy rock was apparently supported by this slab. It fell from the back when O'Connor dislodged the slab, hitting him on the head. He received compound comminuted fractures of the skull and face and was instantly killed. Accidental death with no blame attached to anyone.

Hollinger Consolidated Gold Mines, Limited

Alfred A. Walkley, British, aged 50, married, employed as a sanitaryman underground at the Hollinger mine, received fatal injuries at about 9.20 A.M. on March 18, when he was struck and run over by a train of 13 empty 3-ton cars, which was being pushed into No. 5 North crosscut on the 950-foot level by a 5-ton trolley locomotive.

For some minutes preceding the accident Walkley had been sitting on a pile of round posts, at the turn-off of No. 47AE5 drift from the No. 5 North crosscut, with E. Randall and E. Clement, who had been pulling chutes along the crosscut. The chute pullers were waiting for the 5-ton trolley locomotive to push in a train of 13 empty 3-ton cars for them to use in pulling chutes at No. 22 mill hole. No. 22 mill hole is in No. 47BE4.3 drift about 185 feet north of where the men were sitting. Presently the chute pullers heard the train of empty cars approaching from the south. Randall got up and said he would go in to the mill hole. Clement remained on the log pile. Then Walkley got up and started north up the crosscut. Clement warned him to watch out for the train which was coming.

Fifty feet from where he had been sitting Walkley stopped in the centre of the track on a curve where the crosscut merges into No. 12W5 drift. Looking southward from this point one can see about 75 feet to a curve in the crosscut south of No. 47AE5 drift. The train coming up the crosscut rounded this

curve at an estimated speed of about 6½ miles per hour. At this point the motorman usually cuts off his power to let the cars take up the slack in the couplings so that the latter will not lock on the curve. Z. Pechnick, the switchman, was riding in the first car. He saw Walkley looking toward the train, and expected him to step off the track to the side, where there was plenty of room. Instead of moving, Walkley stood stock-still, looking toward the train. The switchman then yelled, "Get out of the way, Freddie," and struck the airline with his hammer to signal the motorman to stop the train. The car in which Pechnick was riding knocked Walkley down, ran over him, and was derailed. A. Atkinson, the motorman, heard the shouting, felt the jar, and stopped the train. He received the stop signal but had already stopped. Walkley was removed from between the first two cars and taken to the 950-foot level station, where the party was met by the doctor. He examined the injured man in the dry-house on surface. Walkley was taken in the ambulance to St. Mary's Hospital, but died before he reached there, about half an hour after the accident.

Following the accident it was learned that Walkley, who had not been in good health for years, was suffering from a cold and was feeling particularly miserable at this time. He had told Randall and Atkinson that he did not feel fit to be at work.

Atkinson has been a motorman for 18 years. Pechnick had been working as Atkinson's switchman for two weeks and had been spare switchman for some time previous to this.

Walkley's injuries consisted of fractures of both base and vault of the skull, a fractured left arm, and crushed chest.

An inquest was held in Timmins before Coroner H. L. Minthorn, M.D., on March 24 at 4 P.M. The jury returned the following verdict:—

On the enquiry into the death of Fred Walkley on the 950 level at Hollinger mine on March 18, 1943, we, the jury, find death was due to accident with no blame attached to any one.

International Nickel Company of Canada, Limited

Albert Adshead, British, aged 38, single, employed as a senior secondary boss at the Frood open pit, was killed about 9.55 P.M. on June 26, when run over by haulage truck No. 24 as it was backed into No. 2 crushing plant.

This is a Mack 10-wheel dump truck, which weighs about 58 to 60 tons when loaded with ore. It has an overall length of 29½ feet, and a maximum width of 10½ feet. Rear-vision mirrors project from both sides of the cab. There is a red tail-light in the centre of the frame.

The primary unit at No. 2 crushing plant is a large gyratory crusher, which is located about 6 feet below the elevation of the main haulage road. The west side of the plant is open at the road elevation so that trucks can dump directly into the crusher. There are three stalls for the trucks, formed by wood and concrete side curbs, 10 inches in height. The stalls are adequately illuminated at night by overhead lights. The north stall is about 21 feet long and 11¾ feet wide. The secondary bosses have an office in the crushing plant, with the doorway about 8 feet from the entrance to this stall. Dumping and crushing operations do not come under their supervision.

On June 26, No. 24 truck arrived at No. 2 crushing plant shortly before 9.55 P.M., with a load of ore from the south end of the open pit. The driver, C. Tyers, observed that the centre stall was occupied and continued northwards. As the north stall was vacant, he turned the truck out in line and stopped it about 100 feet away. He then backed the truck towards the stall, keeping the south curb in view as a guide. Tyers did not see Albert Adshead in the stall

and did not stop the truck until the rear wheels reached the dump. The truck knocked Adshead down about 18 feet out from the dump, and the rear wheels on the north side ran over him. He was found lying in a jack-knifed position, with his right arm and shoulder on the north curb, and died within a few minutes.

No one saw Adshead enter the stall, but the crusherman, G. Wilson, saw him walking rapidly towards the truck, with his face turned northwards, for several seconds before the accident. Wilson called to the dumpman, W. Oshanek, who was supervising the dumping of the truck in the central stall, and the latter ran over to Adshead.

Adshead had last been seen prior to the accident by his shift boss, W. O'Dell, who left him eating his lunch in the office about 9.45 P.M. His open lunch box was found afterwards on the table in the office beside his hat and gloves. It is surmised that he walked into the stall to throw his lunch refuse into the crusher, and was returning to the office when he was run over. Oshanek had seen him throw refuse into the crusher on previous shifts. There were several pieces of wax paper on the floor of the stall beside the dump after the accident.

An inquest was held by Coroner H. M. Torrington, M.D., at Frood on July 27. His verdict was as follows:—

Albert Adshead came to his death at Frood mine open pit, INCO, on June 26, 1943, from multiple fractures of legs, chest, and back, when he was accidentally run over by Mack truck No. 24 when it was backing into No. 2 crushing plant. Adshead had evidently not seen the truck backing in, and due to noise of crusher, etc., he had not heard the truck. Accidental death.

Charles Russell, British, aged 36, married, employed as a motorman on the 2,200-foot level at the Frood mine, was killed about 6.05 P.M., on July 2, when the trolley motor he was operating crashed into the east ventilation door in No. 3 main crosscut.

No. 3 main crosscut runs westward from No. 3 shaft to the ore body, a distance of about 1,500 feet, and is illuminated by electric lights. No. 3.1 main ore pass is in the crosscut, about 320 feet west of the shaft. Two ventilation doors, 345 feet apart, are located between the ore pass and the ore body to prevent fresh air from passing through to No. 3 shaft. The doors are about 6 feet wide and 7 feet high and are set in concrete frames. They are constructed of 2-inch plank, covered on one side with metal sheeting and hinged on the north side to open westward. The doors are operated by cables attached to air-cylinders located on the north wall of the crosscut just west of each door. The air-cylinder valves are controlled by pairs of cables, which are carried some distance east and west of the doors to horizontal levers. The latter are 6 feet 8 inches above the base of the rail. The lever on the west side of the east door is 149 feet from the door. There are red and green lights above the door, and also 105 feet to the west, to indicate whether the door is opened or closed. An 8-ton General Electric trolley motor is used for main-line haulage and is always placed at the head of a loaded train, with the control end in front. It is the duty of the motorman to operate all door levers on east-bound trips without stopping the train. Mine regulations limit the maximum speed to 3 miles per hour on approaching and passing through ventilation doors. At this speed, there is ample distance between the door levers and the doors in which to stop a loaded train if the brakes are properly applied without undue delay. The motor is equipped for dynamic braking in addition to having a hand brake.

Russell and his switchman, Romeo Hebert, were operating the trolley motor on the afternoon shift of July 2. They made three return trips from the ore body to No. 3.1 main ore pass prior to 6 P.M. without incident, then picked

up 11 loaded Granby cars for their fourth trip. The train, including the motor, weighed about 41 tons. Russell opened and closed the west ventilation door without difficulty as the train moved eastward in the crosscut, then reached for the lever that opens the east door. He apparently did not move it sufficiently, and the door failed to open. He then grabbed at the control cable, and the door started to open slowly. By this time, he was some distance past the lever. Russell started to apply the hand brake when the train was about 75 feet from the door. Hebert was sitting on the deck of the motor, and it appeared to him that they would crash into the opening door. He jumped off the motor when they were about 50 feet away and yelled at Russell to do likewise. The train was then travelling at a speed of 3 to 4 miles per hour. Russell, however, remained standing with his left hand on the power controller and his right hand on the hand-brake wheel. The motor hit the half-open door and forced it through the door frame. The train came to a stop after the motor had passed almost completely through the frame. Russell was found lying on the deck of the motor with the buckled door on top of him and was dead when reached. He had sustained a crushed chest and fractures of the skull, spine, ribs, legs, and right arm, with internal haemorrhage and traumatic asphyxia.

An examination of the motor revealed that the hand-brake wheel was not turned completely on and was broken in several places. The directional lever was in the forward-motion setting. The control box was broken, and the power controller was jammed in the full-on position. The trolley shoe was not in contact with the conductor wire.

The door-opening mechanism was found to be in good order. The lever was about midway between the open and closed positions.

An inquest was held by Coroner P. E. Laflamme, M.D., at Frood, on August 18. His verdict was as follows:—

Charles Russell, aged 36, employed as a motorman at the Frood mine of the International Nickel Company, was killed about 6.05 P.M. on July 2, 1943, when he was crushed between the trolley motor he was operating and the east ventilation door in No. 3 main crosscut, on the 2,200-foot level. From evidence given, it was Russell's duty to operate the lever controlling this door, located 149 feet away, without stopping the train. On this trip, he apparently did not move the lever sufficiently to cause the door to open. Instead of stopping the train, he then grabbed at the cable connecting the lever to the air-cylinder valve, and the door started to open slowly. He started to apply the hand brake when the train was about 75 feet from the door. The switchman, Romeo Hebert, saw the danger and jumped off the motor when it was about 50 feet from the door. Russell did not slow down the train in time to prevent it from crashing into the half-open door. The door fell on top of him, crushing him against the motor. He died from multiple fractures and intercranial haemorrhage. Accidental death with no blame attached to anyone.

Albert Bealer, British, aged 38, married, employed as a stope boss at the Frood mine, was instantly killed by a fall of ground in No. 15.75 stope, on the 1,800-foot level, about 11.20 A.M. on October 26.

This square-set, cut-and-fill stope is five sets wide and extends from footwall to hanging wall. The sets are at 5½-foot centres and are 7 feet high. At the time of the accident, the 26th floor had been started from the fill raise adjoining the south pillar near the hanging wall, and a 2-set-wide cut was being mined toward the north pillar on a one-shift schedule. Two rows of two sets each had been previously installed, and the breast had been blasted at quitting time on October 25 to make room for a third row.

The crew in this stope on October 26 consisted of a stope boss, A. Bealer, and two men, V. Jakopin and A. Houle. The latter was employed on the mucking-floor. Bealer and Jakopin found that the muck from the blast was piled up to a height of 3 or 4 feet above the elevation of the mining-floor. Shift Boss

D. Still visited the stope about 8.30 A.M. and found them scaling from under cover and barring down the muck. He observed fractured ground on both sides of the cut and instructed Bealer to scale it down, then drill and blast five large chunks on the muck pile. The block-holes were blasted about 10 A.M., following which the timber for the new sets was lowered into the stope. Bealer and Jakopin then scaled and finished barring down the muck below the elevation of the mining-floor. They subsequently laid the flooring for the hanging-wall set. Houle came up from the mucking-floor about 11.15 A.M., on his way out for lunch, and found them in the second row of sets. He noted the work in progress and asked Bealer if they were going to stand the set without booms. Bealer replied affirmatively. Houle then held a square-set post while Jakopin trimmed the horn with an axe. Bealer walked out on the new flooring toward the north-east corner, where he was hit and instantly killed by a fall of ground from the untimbered back, about 11.20 A.M. Jakopin was hit on the left foot and sustained a fractured metatarsal. His location at the time of the accident is uncertain. Houle was under the timber and escaped injury.

The fall of ground covered the new flooring with flat slabs of ore having a total weight of about two tons and broke it down the centre parallel to the breast. The fall exposed a nearly horizontal slip in the back. One slab, weighing about 700 pounds, had to be lifted from Bealer's legs before he could be moved.

It has been standard practice at the Frood mine for over ten years to put out booms over the area to be timbered and cover them with heavy lagging, to protect the men while installing sets.

An inquest was held by Coroner H. M. Torrington, M.D., at Frood on November 12. His verdict was as follows:—

> Albert Bealer came to his death at Frood mine, International Nickel Company, on October 26, 1943, from multiple injuries to head, neck, and chest, received October 26, 1943, while working in 15.75 stope, 1,800 level, Frood mine, when a large piece of rock fell on him. This piece of rock he had failed to detect as loose when scaling and it fell on him before they had placed the booms and timber for their protection. Accidental death.

Herbert F. Milks, British, aged 54, married, employed as a foreman at the Frood mine, was instantly killed about 11.55 A.M. on December 9, when he was crushed by a ventilation door in No. 3 main crosscut on the 1,800-foot level.

No 3 shaft station is about 20 feet north of No. 3 main crosscut, with which it is connected by a manway crosscut and a haulage drift. The latter intersects the main crosscut about 135 feet east of the manway crosscut. Twin ventilation doors are located in the double-tracked main crosscut about 15 feet east of the manway crosscut. The doors are 6 feet wide and 7 feet high and are set in separate openings in a concrete bulkhead. They are constructed of 2-inch plank covered with sheet metal and are hinged on the sides adjoining the crosscut walls to open westward. They are opened by hand and closed by 25-pound counter-weights assisted by the ventilation pressure. No. 3 main waste pass from the 1,600- to the 2,000-foot level is on the north side of the main crosscut, about 171 feet west of the ventilation doors. This pass had been backfilled with rock up to a point about 80 feet above the 1,800-foot level in October, 1942. It became necessary to use this portion of the pass again, and the removal of the backfill was started on December 5. No difficulty was encountered until the following day, when the backfill was found to be hung up about 55 feet above the 1,800-foot level. Pole blasting was then begun from an entrance on the 1,800-foot level and was still in progress at the time of the accident.

On December 9, four men were engaged in this work under the supervision

of Foreman H. F. Milks. They blasted three times prior to 11.30 A.M., then prepared a fourth charge consisting of 47 sticks of 40 per cent. Forcite. Milks sent A. Maki to the 1,600-foot level to warn some men working at the top of the pass, with instructions to telephone him when it was safe to blast. He received this telephone call at No. 3 shaft station and shouted a blasting clearance to his men at the pass, then remained to guard the eastern approach to the blasting zone. He probably took up his usual position just inside the manway crosscut. W. Kangas connected the blasting cable to the lead wires, then proceeded with E. Haldin and L. Mantilla to the blasting battery, located in the main crosscut about 140 feet west of the pass. He detonated the charge about 11.55 A.M.

Meanwhile, a train crew under the supervision of Level Boss D. Inglis had picked up two powder cars and a fuse truck in the station drift with a battery locomotive and were about to move the train westward on the south track of the main crosscut when the blast occurred. No warning had been received by them. Inglis then walked westward in advance of the train and pushed open the south ventilation door. He found Milks lying across the south rail of the north track immediately west of the doors.

Milks had sustained severe crushing injuries to his head and was dead. His hard hat, note book, and various papers were found scattered around on the east side of the doors. There were blood stains and brain matter on the south door and on the bulkhead between the doors, indicating that his head had been crushed between the door and the bulkhead. The ventilation pressure on the door totalled about 10 pounds prior to the blast.

An inquest was held by Coroner G. A. Henry, M.D., at Frood on December 16. His verdict was as follows:—

From the evidence adduced it is established that the deceased, H. F. Milks, was guarding against anyone entering the danger zone from the east at the time of the accident. He apparently heard a motor approaching the ventilation doors from the east near where he was located and went to the doors, partly opened one door—probably just as the blast occurred—to warn whoever was there. He was caught by the door closing suddenly, as a result of which his head was badly crushed. No one witnessed the accident. The accident occurred on the 1,800-foot level in the Frood mine at about 11.55 A.M., December 9, 1943.

Kerr-Addison Gold Mines, Limited

Vital Joseph Vincent, chute puller, was instantly killed at 6.05 A.M. on May 21 on the 300-foot level of the Kerr-Addison gold mine. Vincent was 24 years of age, a British subject, married, with one dependent, and had been employed underground at the Kerr-Addison mine since January 28, 1942.

The accident occurred at No. 10 chute in No. 306 crosscut below No. 309 stope, when a bomb of 10 sticks of powder, placed in the raise above No. 10 grizzly, became dislodged and fell into the open chute-raise, where it exploded. Vincent, who was cleaning up under the chute, was warned that a heavy pole blast was to be shot and was told to guard the chute since it was empty. He had replied and had told the blasters to go ahead, but had neglected to move away from the chute.

No. 309 shrinkage stope has been mined through to surface and is now being pulled. Chutes on the level are 4 feet 8 inches inside dimension, with the lip 5 feet 8 inches above the track. They are equipped with steel gates operated by hand from a gangway or chute platform, which is 7 feet above the track. Chutes are usually installed in opposing pairs, chute lips being 3 feet 6 inches apart. The chutes draw from grizzlies in the grizzly drifts, which in turn draw from the stope. The grizzly level and the stope sill are 35 feet and 60 feet, respectively, above the track. In this case No. 10 chute, pulling from No. 10 grizzly, and No. 9 chute, pulling from No. 9 grizzly, were paired.

On the graveyard shift of May 20, the pulling crew consisted of A. Matthieu, motorman, and Couture and Vincent, chute pullers. On trips to the dump the chute pullers alternated as switchmen, the other remaining behind to clean up. The crew on the grizzly level consisted of two pairs, J. W. Couture and his helper, P. Matthieu, and N. Cadieux and his helper, J. P. Bedard. Cadieux was the leader of the grizzly crew.

At about 5.30 A.M., the mucker boss, J. B. Parrott, visited No. 10 grizzly and found Couture and Matthieu washing the raise above No. 10 grizzly to bring down the muck. As the muck did not come down, it was decided to blast. A bomb of 10 sticks was prepared and tied with cord. A 16-foot, 1- by 2-inch blasting-pole was sharpened at the end and thrust crossways through the bomb. The 5-foot fuse was given a double hitch around the blasting-pole.

After the fuse was lighted the pole was placed in position, the butt end being propped against the wall of the grizzly excavation. Previous to lighting, Couture called down to Vincent twice that they were going to blast a pole blast. Vincent replied "O.K., go ahead and blast." The chute was empty, and the train had gone to the dump. It was then Vincent's duty to guard the chute. In case no reply had been received by Couture, it was Couture's duty to have the chute guarded.

When the shot went off, J. B. Parrott was at the foot of the manway from the grizzly level to No. 305 west drift. This point is 130 feet from No. 10 chute and around two corners. Since the shot sounded unexpectedly heavy he went back to No. 10 grizzly, where he found Couture and Matthieu awaiting the clearing of the smoke. They said the muck had not come down. Parrott then went to No. 11 grizzly. From this point, with Cadieux, he went down the manway of No. 305 west drift to No. 306 crosscut, where they found Vincent dead. He was lying, face downward, beside the north chute-post of No. 10 chute. Parrott at once called up to Matthieu and Couture not to do any more blasting and said that Vincent was dead. By this time, a previously made-up bomb had been primed and attached to a blasting pole. Couture had just spit the fuse. He at once cut off the fuse 7½ inches from the cap and dropped the pole and bomb beside the grizzly. Matthieu and Couture and Bedard, who was at No. 11 grizzly, went down to No. 10 chute. Parrott summoned aid at the shaft and waited there till K. Dewar, the mine superintendent, and the doctor arrived.

When the body had been removed, Cadieux returned to No. 10 grizzly to get the powder of the bomb from which Couture had cut the fuse. He intended to return it to the powder box. He could not find it beside the grizzly, although the blasting-pole was there, but on looking through the grizzly, he saw it in the chute. He called down to Matthieu to put the powder in the magazine and the cap in the fuse-box.

Examination of the scene of the accident showed that No. 10 chute was practically empty. There was a space of about 3 inches under the chute-gate over about a third of its length. The chute had not been damaged. There were no definite indications of the exact location of the blast, but it did not seem to have been either in the chute or on the drift. The blasting-pole was found intact in the chute raise with 34 inches of burnt fuse attached to it. One end of the fuse was split, and the other end was ragged.

It is probable that the blast occurred on the foot of the chute raise, which for 10 feet is at an inclination of 35 degrees. If Vincent was standing between the rails at that time his head and shoulders would have been exposed to the force of the blast. Probably a fall of small muck dislodged the bomb from the blasting-pole after the fuse was lighted and cut the burnt fuse, and the concussion of the blast then caused the pole to slide through the grizzly into the chute.

Vincent suffered the following injuries: the back of the skull at the base of the brain blown off; all cervical vertebrae broken; long laceration on the left side of the neck; powdered rock in the brain; small puncture wound on right forearm below the elbow; several small abrasions on the right shoulder.

An inquest was held before Coroner H. F. Richardson, M. D., in Larder Lake at 8 P.M. on June 2. The jury returned the following verdict:—

We find that Vital Vincent met his death on May 21 at 6.05 A.M. on the 300-foot level of the Kerr-Addison gold mine. That his death was accidental. That death was caused by dynamite blast, and air concussion and particles of flying rock.

John Beverly Parrott, aged 32, British, married, with four dependents, employed as mucker boss, was instantly killed on No. 3 grizzly of No. 309 stope of the Kerr-Addison mine at 6.30 P.M., June 11. He was crushed by a large rock against the broken end of the centre grizzly timber.

Parrott had been employed at the Kerr-Addison mine from March, 1941, to July, 1941, and from March, 1942, to the time of the accident in the capacities of machineman in stopes, raises, and the shaft, and as timberman and stope leader and grizzly leader. He had been mucker boss since May 20, 1942.

No. 309 stope is a large shrinkage stope, which has been completed through to surface and is now being pulled on the 300-foot level.

There is a grizzly level 35 feet above the 300-foot level. The stope floor is 20 feet above the grizzly level.

The nominal size of the chute raise at the grizzly is 7 by 14 feet. Raises are driven from each end of this excavation to the stope floor. The grizzly consists of three 12- by 14-inch timbers, 16 feet long, hitched at each end on the solid and resting in the centre on a 12- by 14-inch cross-timber, also hitched on the solid. Spreaders for the grizzly member are 12- by 14-inch blocks resting on the cross-members. All timbers are covered with 12-inch channels. The grizzly spacing is 20 inches.

The crew pulling No. 309 stope on the afternoon shift consisted of the following men: D. Paquette and J. Wnuk, chute pullers; J Mackenzie, motorman; E. Rainville and T. Denner, grizzly men on No. 7 chute; and Philip Hamel, grizzly leader. As Hamel's partner was not out on this shift, Parrott was working with him on No. 3 grizzly.

The centre grizzly member had been partially broken on the west end at 2 P.M. that day. When the afternoon shift came on it was their intention to hang-up the west raise, so that the grizzly could be repaired. The west raise was already hung up. At the change of shifts, the west raise was running freely. At 6 P.M. six block holes were blasted on the grizzly. The west 5½ feet of the centre grizzly member was completely severed by the blasts and some large muck passed into the chute raise. Before the blasts there was probably only about 10 feet of muck in the chute raise.

After the blasts both Parrott and Hamel looked the situation over and decided that after they blasted the west raise again, it would probably be securely hung up. The grizzly was well exposed, and both men knew that the west 5½ feet of the centre grizzly timber was out.

Hamel spit a pole blast in No. 3 grizzly, while Parrott went down to the foot of the manway to have the motor crew guard No. 3 chute.

Arrangements had been made to blast No. 7 grizzly after the blasting of No. 3 grizzly. Parrott, therefore, after the blast in No. 3, told Hamel to spit the fuse in No. 7 and sent Denner, the helper in No. 7 grizzly, down the manway to guard. He called down to Denner to tell the motor crew to pull No. 3 chute.

The train crew, who were near the foot of the manway, heard him. Parrott, Hamel, and Rainville went into No. 3 grizzly while awaiting the shot.

Hamel looked up the raise from the grizzly, standing close to the wall and holding on to the safety chain, which is suspended over the grizzly from brow to brow and caught up to the back over the centre of the grizzly, so as to prevent undue swinging of the chain. At that time, the raise below the grizzly was full and the muck covered all the west end of the grizzly to about 2 feet from the centre.

Parrott then took Rainville's place standing along the wall of the grizzly excavation and shining his light up the raise, but without holding the safety chain.

Suddenly the muck dropped to 4 feet below the grizzly. Simultaneously two large blocks commenced to slide down the muck slope in front of Parrott. Parrott attempted to pass across the grizzly, apparently forgetting that the centre grizzly timber at that end had been broken out. He did not succeed in grasping the safety chain and fell through the grizzly. As he was falling through he was struck by the larger block and impaled on the end of the broken channel iron covering the grizzly timber. The block weighed between two and three tons. The other block, weighing over a ton, came to rest against it.

Death was instantaneous. He received the following principal injuries: crushing of the heart, puncture of the lungs, fracture of all ribs and the clavicle, tearing of the muscles of the left chest, and various abrasions. A doctor was in attendance shortly after 6.45 P.M. The body was removed at 8.30 P.M.

The chute pullers, after receiving instructions from Parrott following the blast in No. 3 grizzly, had gone in to pull No. 3 chute. They pulled one 4-ton car, then barred down a large block which was hanging up the chute. They dropped this block about 6 feet. About two minutes after this they were notified to come up to the grizzly level because there had been an accident.

An inquest was held in Larder Lake on June 17 at 4 P.M. before Coroner H. F. Richardson, M.D. The jury returned the following verdict:—

We, the jury selected to enquire into the death of John Beverly Parrott at the Kerr-Addison mine on June 11, 1943, find that John Beverly Parrott came to his death at 6.30 P.M. on June 11, 1943, on the 300 grizzly level at No. 3 grizzly at the Kerr-Addison mine by being crushed against a broken grizzly bar by a large rock. We attach blame to no one.

Lake Shore Mines, Limited

Fred Joseph Lafond, mucking-machine operator, was instantly killed by a fall of ground in No. 5,301 East drift of the Lake Shore mine at 7.35 A.M., July 27. Lafond was 31 years of age, married, with five children, and was British, of French-Canadian descent. He had been employed at the Lake Shore mine since August, 1936.

When Lafond and his helper, J. Grant, came on shift at 7 A.M., Grant went to the 5,675-foot level for the motor. When he got back to the 5,325-foot level he switched the gear truck and brought in the mucking machine, one car, and the motor. When he arrived at the face of No. 5,301 East drift, Lafond was wetting down the muck. Then Lafond attempted to scale down some loose from the back on the north side of the drift about 20 feet from the face. He did not succeed in getting it down alone. He and Grant both tried working from the west side of the loose piece, but failed to remove it. Grant then commenced to clean up the track about 45 feet from the face, and Lafond again attempted to scale the loose piece, working from the east side.

A wedge-shaped block of ground about 8 feet long fell from the south wall

and back. The west end of the piece struck and pinned Lafond down as he was scaling. Grant saw that he was dead and called F. St. Jean and C. Bouchard, drillers in No. 5,301 West drift, then went to the No. 6 shaft station to call for help.

Lafond's body was removed from under the rock at 7.50 A.M. He had suffered the following injuries: a fractured skull, broken neck, broken back, fracture of the right leg, and crushed chest. Death was ascribed to fracture of the skull and neck.

From examination of the scene of the accident, it was noted that No. 5,301 East drift carries a strong break or slip in the south wall, which dips about 75° S. The block of ground causing the accident was between this slip on the south wall and another less definite slip with much the same strike, which intersected the first slip two feet above the original back. The second slip had apparently showed as a crack along the centre of the drift back. The block was wedge-shaped in section, 8 feet long and from 2.8 feet wide at the west end to 3 feet wide near the east end. It was 2 feet thick on the south side and tapered off to a sharp edge at the north side. The upper surface was slightly convex and quite slick. The south side was also slick. From 4 to 6 inches of the upper surface at the north edge was wet, indicating that there must have been an open crack previous to the accident, into which the water from the spraying of the back had penetrated.

An inquest was held on Thursday, July 29, at 9 P.M. in Kirkland Lake Municipal Hall before Dr. R. W. McBain, M.D. The jury returned the following verdict:—

We, the jury, find that Fred Joseph Lafond met accidental death at the Lake Shore mine on the morning of July 27, at 7.30 A.M. He was working in 5,301 E. drift. Cause of his death was a fall of rock. We find that death was instantaneous.

McIntyre-Porcupine Mines, Limited

John James Mortensen, British, aged 22, single, employed as a flotation operator's helper, was killed at about 12.45 P.M. on January 6, when he was caught and thrown by the vertical drive-shaft of a Denver Fahrenwald No. 26 flotation cell in the No. 4 cell in section A4 on the flotation floor of the McIntyre-Porcupine mill.

The flotation floor covers an area about 65 by 135 feet, and the equipment consists of four rows of four sections, each section having 6 Denver Fahrenwald No. 26 cells. The rows run north and south. The 12 cells at the north end of each row comprise the secondary circuit. Section A4 is at the northwest corner of the floor.

An operator and a helper work on the flotation floor. On January 6, on the 7 A.M. to 3 P.M. shift, the crew consisted of C. V. Ray, operator, and John Mortensen, helper. Mortensen was employed on December 4, 1941. He had previously worked in a hardware store in Timmins.

No one was working close to Mortensen when he was injured. Ray, who was working among the cells of the secondary circuit, discovered that the accident had occurred when he began to investigate the reason for abnormal frothing in the cells.

At No. 4 cell Ray found Mortensen supended by the left leg over the top of the spindle screw controlling the weir at the right side of No. 4 cell, with his head and shoulders immersed in the mixture of water, oils, and ore in the cell. The corresponding screw on the left side of the cell had been struck and slightly bent. Mortensen was dead.

Mortensen had been carried around by the cell agitator shaft, which normally rotates at 250 r.p.m., when the cuff of his overalls was caught under the dust cap on the shaft close to the lower bearing. His injuries included fractures of both legs, both forearms, upper right arm, neck, and skull. His hands and forearms were also burned by friction, and his rubber gloves were torn to shreds. Mortensen's cleaning cloth was wound loosely around the shaft above the dust cap. This suggests that he probably gripped the rotating shaft when his trouser caught. He was then thrown clear of the shaft. A 20-pound pail of flotation reagents had been overturned, and the contents spilling into No. 4 cell had caused the frothing.

Evidently Mortensen was cleaning the 2-15/16-inch vertical drive-shaft on the cell agitator. The shafts in cells Nos. 1, 2, and 3 in No. A4 section had been cleaned. During the morning he had greased the drive shafts on all the cells. This is done once every three weeks. During the eleven years that this plant has operated, the shafts have been cleaned about once every six weeks. After the loose grease is wiped off, the shafts are cleaned with emery paper. This work has always been done while the cells were operating. A wide plank that fits over the cell is provided to stand upon. Mortensen was not using this plank, which was found later on a cell in section No. C1 of the east row. It is thought he was standing with his right foot on the wall between cells Nos. 3 and 4 and his left foot on the horizontal beam carrying the lower bearings. In this position the cuff of his left trouser would be very close to the lower bearing. Above the lower bearing there is a dust cap, which is supposed to turn with the shaft. Less than half of these dust caps do rotate. This one evidently turned, as it did so after the accident. There is a counter-sunk setscrew which is supposed to hold these caps rigid on the shaft. It is believed Mortensen's trouser cuff was either too close to this bearing or that his foot slipped and jammed the cuff under the rotating dust cap. A piece of material about 24 by 8 inches was torn from his trousers, and the cuff was also torn off his overalls. The trouser material was wound tightly between the dust cap and the top of the bearing. This overloaded the 5 h.p. motor and caused the overload cut-out to stop it.

The immediate cause of Mortensen's death was given as suffocation due to drowning. His other injuries were contributory to his death.

An inquest was held before Coroner Frank Evans at Schumacher at 4 P.M., on January 13. The jury returned the following verdict:—

We, the jury, find that John James Mortensen came to his death about 12.45 P.M., January 6, 1943, at the mill of McIntyre-Porcupine Mines, Limited, and that death was accidental, but would recommend that the plank used as a platform be made stationary for the purpose of cleaning the shaft and that all men working on this machine be given printed instructions as to safety.

MacLeod-Cockshutt Gold Mines, Limited

Uuno Vihtori Ronii, alias Victor Koski, was instantly killed, and Frank Majewski suffered serious injuries when they drilled into a bootleg containing powder in No. 403 subdrift from No. 403 stope of the MacLeod-Cockshutt mine on February 15 at 2.20 P.M. Both men were drillers. Koski, who was acting as helper to Majewski, had been employed at the mine since November 27, 1943. He was 44 years of age and was born in Finland. He was recorded by the company as single.

The back of No. 403 cut-and-fill stope at the time of the accident was approximately 35 feet below the rail of the 3rd level. At the east end of the stope a subdrift had been driven about 30 feet to the east on an ore extension. The last three rounds of the subdrift had been raised at an inclination of 40 degrees.

At the start of the day-shift, Stope Boss Ralph Burry, with Majewski and Koski, had examined the face of the subdrift, which had been blasted by the night shift. Burry had instructed Majewski and Koski to drill some slash holes along the south side of the subdrift, using a stoper drill. Mine Captain Harold Paul arrived in the stope at this time and confirmed the instructions. The east wall of the subdrift was then washed thoroughly down and two missed holes were reblasted. Paul returned to the stope again at 1.30 P.M. and instructed Majewski to drill three more slash holes farther back in the drift. Majewski was doing the drilling, and Koski was acting as helper. Koski was also rated as a driller. At about 2.20 P.M. Harry Guzda, a slusherman, working about 80 feet away from the drillers, heard an explosion and then a call for help. He and D. Pawluk, a fillman, ran over to the subdrift and found Majewski standing with his face in his hands. They could not see Koski at the time because of powder smoke. They escorted Majewski, who was able to walk, to the surface and notified others, who proceeded to No. 403 stope. Koski was found lying in the subdrift almost decapitated. He was taken in a stretcher to the surface where the rescue party was met by Dr. Riches.

Examination of the working place showed that Majewski and Koski had started a slash hole in a cut-off hole from a previous blast. Half of this hole still showed on the wall of the subdrift, and it was possible from this to determine what had happened. This section of the hole had originally been completed with an 1¼-inch diameter bit, and the men were using a starter bit 1¾ inches in diameter to start the new hole. The total depth of the bootleg was 2 feet. The 1¾-inch bit had followed the course of the bootleg for 8 inches without turning, as the wing of the larger bit grooved the side of the bootleg for this distance. The remainder of the section of the bootleg had pieces of the powder wrapper clinging to the side. There apparently had been 2, if not 3, sticks of powder in the hole and 4 to 6 inches of rock burden on the bootleg previous to the detonation. The men had been using a stoper drill and drilling at an angle of 40 degrees with the bottom of the drift. Owing to the low angle with the wall there had been a temptation to start this hole in the bootleg. The slash hole 2 feet above, which these men had previously completed, had also been obviously started in a bootleg.

On being questioned at the hospital Majewski stated that he was operating the stoper and that Koski was standing next to the drill steel when the explosion occurred. Majewski stated that he had attempted to start the hole behind the bootleg and that the drill steel slipped into the bootleg. He stated that he had noticed this bootleg and that it appeared to be only about 2 inches deep, but he did not test it. It is evident, however, that he had drilled in the bootleg for at least 8 inches before the explosion occurred.

Both men were rated as experienced drillers. Instructions regarding the drilling had been given by Mine Captain Paul. Stope Boss Burry had visited these men before they moved to the last row of holes. Burry was not in the stope when the accident happened. Both Paul and Burry state that they had not noted this bootleg previous to the accident.

Koski's death was due to extensive skull and brain injuries. He was almost decapitated by the blast. Majewski suffered lacerations of the face and scalp, loss of sight of the left eye and possible loss of sight of the right eye also.

An inquest was held at the Geraldton Town Hall at 10 A.M., February 17, before Coroner Dr. Chas. Powell. The jury returned the following verdict:—

Uuno Vihtori Ronii, alias Victor Koski, died on February 15, 1943, at MacLeod-Cockshutt mine. The cause of death was due to Koski and Majewski not observing the regulations of the Mining Act in that they drilled into a bootleg hole.

Paymaster Consolidated Mines, Limited

Arvi Kari, a naturalized British subject of Finnish birth, aged 38, married, with one child, was instantly killed by an explosion in No. 2,423 drift, 2,450-foot level, of the Paymaster Consolidated mine at 3.15 P.M., February 26, and Joseph Popes, a naturalized British subject, born in Jugoslavia, aged 47, married, with three daughters, one of whom is married, received injuries at the same time, which resulted in his death from peritonitis on March 4. Both men were employed as machine runners.

Kari and Popes set up in No. 2,423 drift in the morning of February 26 and drilled a burn-cut round; there were 31 holes, all about 7 feet 2 inches long. The burn-cut was drilled just below the centre of the face and consisted of three rows of holes, 4 in the top row, 3 in the centre row, and 3 in the bottom row. The square-up holes consisted of 3 cut helpers, 3 back holes, 3 lifters, 2 left-hand side-holes, 2 right-hand side-holes, one of which was close to the right corner lifter, and 8 holes in the remainder of the face between the cut helpers and the outside holes. At the end of the shift the round was loaded using 70 per cent. Polar Driftite powder and 8- and 11-foot lengths of Black Clover brand fuse. The 4 corner holes of the cut, the cut helpers, and the square-up holes, 25 in all, were loaded, using 33 fuses. Two fuses were used in each of the 3 lifters and also in the left-hand shoulder, breast, and knee holes, and the two left-hand side-holes, although the face was not wet. The fuses were all trimmed and slit ready for firing. Kari lighted the 4 loaded cut holes and 3 cut helpers. Popes was standing on the right side of the face. He was holding a lighted spitter in his hand ready to light the square-up holes on the right-hand side of the face as soon as Kari had finished with the cut helpers and had started to light the left-hand square-up holes. He had just handed the end of a fuse to Kari to light when one or more of the cut-hole charges exploded.

Popes was injured but was able to get out some distance from the face to a point near the corner of the drift and No. 2,410 crosscut, where his cries for help brought several men to his aid. One of these men was Jilks, the cagetender, who had just brought the cage to the level as the explosion took place. The men found Popes in the drift about 115 feet from the face and carried him around the corner into the crosscut, where they laid him down at his request. Jilks ran back to the cage and went up to the collar at the 2,000-foot level. He instructed a sampler to telephone for a doctor, picked up a stretcher, and returned to the 2,450-foot level, stopping at both the 2,200- and 2,325-foot levels for additional help. Popes was then carried along the crosscut to the station, and just at this time three or more shots went off. It is estimated that three or four minutes elapsed between the first explosion and the remaining ones. Popes was taken to surface and then to the Porcupine General Hospital.

After waiting until they were sure no more shots would go, the men went into No. 2,423 drift and found Kari's body about 27 feet from the face. He had been killed instantly by the blast, the top of his skull being blown off.

When the scene of the accident was examined later the wires of two fuse spitters were found in the drift, one about 9 feet from the face, and the other beside Kari's body about 27 feet from the face. The back and crystal of Pope's watch were also found in the drift about 27 feet from the face. The rest of his watch remained in his clothing. Eighteen charged holes remained unlighted in the face. The fuses were slit, ready to be fired. There were 26 fuses in the 18 holes, 2 having been placed in each of the 3 lifter holes and in 5 other holes in the left half of the face. The face was perfectly dry.

Popes had sustained a broken third finger on the left hand and abrasions to

the left arm and hand and the left leg and around the groin. Swelling started on February 27, and it was suspected that he might have a punctured intestine. An X-ray was taken but did not show any rock deep enough to cause such a puncture. The swelling receded and Popes improved for two and a half days, then suddenly became worse. He was operated upon early on March 4. The operation disclosed a rupture about three-quarters of an inch in length in the small intestines. No rock was found here. He died twelve hours later, death being ascribed to peritonitis.

An inquest was held before Coroner Frank Evans in South Porcupine at 4 P.M., March 17. The jury returned the following verdict:—

We, the jury, find that Arvi Kari came to his death on Friday, February 26, 1943, about 3.15 P.M. in the 2,423 drift, 2,450-foot level, of the Paymaster Consolidated Mines, Limited, in the township of Tisdale, by being blasted, and that Joseph Popes died in the Porcupine General Hospital, on Thursday, March 4, 1943, about 5.45 P.M., from injuries received from the same blast. We find that cause of death in both cases was accidental, with no blame attached to anyone.

The cause of the explosion of the burn-cut in No. 2,423 drift has not been determined. Kari and Popes had excellent records as a good and efficient drift crew. As the face was perfectly dry, there should have been no delay in lighting. The fuses supplied were in 8- and 11-foot lengths. There is little likelihood that the men mistook an 8-foot length for an 11-foot when they were trimming the fuse for proper rotation of the shots. The pieces cut off to give proper timing, and found after the accident, seem to show that this work was done properly and that too much was not cut off any of the fuse. It is possible, however, that there was a short fuse. There may have been difficulty in lighting the fuse, with a resulting loss of time. Some of the fuse had been in the fuse box on the level for some time and was not considered very good by the men. For this reason they placed two fuses in many holes, even though the face was perfectly dry.

Robert M. Van Luven, aged 47, British, married, with one child, employed as a rod-mill operator at the Paymaster Consolidated mine, was asphyxiated in the south ore bin about 5.45 A.M., on March 19.

Paymaster mill ore is stored in three large bins almost identical in size and shape. The south bin is 19.5 feet wide, 24.5 feet long, and 31.5 feet deep, inside dimensions. It has a flat concrete bottom. The north wall of the south bin is also the south wall of the centre bin. The walls of the bins are constructed of 2-inch planks laid flat on one another. Opposite walls are tied together by horizontal tie-rods, 1½ inches in diameter. Two vertical rows of tie-rods running north and south and three vertical rows running east and west divide the bins into 12 rectangular areas each about 5 by 8 feet. The rods are spaced at 5-foot centres. The ore from each of the bins discharges through a 15- by 18-inch steel chute on to a conveyer belt.

Van Luven had been employed in the mill since August 31, 1942. He had previously worked underground. On the 19th he was working on the graveyard shift from midnight to 8 A.M. The only other men on shift in the same building at this time were Dan Waters, the night foreman, and Isadore Derasp, a helper. About 5.45 A.M. Waters noted that the conveyer belt to the rod mill was not carrying any ore and, upon going to the bin discharge chute, he discovered Van Luven's body in the throat of the chute, blocking the hole. The left leg and left arm were projecting through the chute. He had no perceptible pulse when found and was pronounced dead when the mine doctor arrived. Van

Luven was completely buried under 5 or 6 feet of fine ore in the centre of the bin. Around the edges of the bin the depth of ore varied from a minimum of 14 feet to a maximum of 28 feet.

An attempt was made to take Van Luven out through the steel chute by burning part of it out, but he was in such a position that this was impossible. The centre bin was almost empty at this time, and recovery work was started by mucking down to the floor and cutting a hole in the centre of the dividing portion between the two bins. While this was being done planks were driven down in spiling fashion through the centre third of the south row, which ran east and west. This spiling held back the muck across both ends and the south side of the bin and reduced the area to be mucked to one-fourth. Miners and mine timbermen were called upon to do most of the work, about forty men taking part in the operation. Van Luven was lifted out of the chute at 12.55 P.M. The mine doctor was present again when he was removed.

Investigation revealed that Van Luven had ignored warnings and large signs stating that workmen were forbidden to enter these bins unless in safety-belts and with another man on the floor. He had been warned, in the presence of men on the retiring shift, about this dangerous practice when he was changing to go to work at midnight, the night of the accident. A pick was found in the bin. A safety-rope and belt was found hanging in the bin. Derasp stated that he saw Van Luven down near the rod mill about five minutes before Waters found him. He had not told either of these men that he was going to the bin.

An inquest was held at South Porcupine at 4 P.M. on May 19 before Coroner Frank Evans. The jury returned the following verdict:—

> We, the jury, find that Robert Van Luven came to his death on March 19, 1943, about 5.45 A.M. at the Paymaster Consolidated Mines mill in the township of Deloro by falling into the ore bin and being suffocated, death being accidental.

Antonio Yantha, aged 31, British (Canadian born, of Polish extraction), married, with one child, employed as a carpenter foreman, received fatal injuries about 3.40 P.M. on July 7, when he fell 27 feet from the roof of the Paymaster crushing plant to the ground. He was attended by a doctor who was on the property at the time; he died a few minutes later en route to South Porcupine Hospital.

Yantha had been employed as a carpenter at the Paymaster mine since October 23, 1939. He was made carpenter foreman on May 4, 1942. He had previously worked at the Buffalo Ankerite mine and also as a carpenter for building-firms in Timmins and South Porcupine.

Yantha was applying "Tremco" roof compound to the roof covering of the crushing plant. The slope of the roof is 30 degrees. Yantha was wearing crepe-soled shoes. He was working on a strip about 10 feet wide, extending from the eave to the peak of the roof, backing up the roof from the eave. He was using a bristle brush, similar to a scrub brush, with a three-foot handle. He had worked back about 5 feet from the eave when he evidently stepped in the fresh compound and then slid off the roof, landing on the ground in front of an entrance to the building. He had no rope or other means to prevent such an accident.

Both his legs, back, and one arm were fractured, and his skull was badly crushed.

Yantha was considered a careful workman by R. Raymer, the mechanical superintendent, who stated that Yantha had used a rope a few days earlier when doing the same sort of work on the bunk-house roof. J. Cowie, a carpenter, who

had been instructed to help Yantha after he completed another job, related that Yantha had told him the roof was quite flat and that he would not need any rope. Yantha was alone at the time of the accident, but he was found immediately after the fall by two mill men who heard him scream as he fell.

An inquest was held by Coroner Frank Evans at South Porcupine at 7.30 P.M. on July 13. The jury returned the following verdict:—

We, the jury, find that Antonio Yantha came by his death about 3.40 P.M., July 7, 1943, at Paymaster crusher-house in Deloro township by accidentally slipping off the roof that he was repairing.

Preston East Dome Mines, Limited

Gerald D. McWhirter, British, aged 18, single, employed as a switchman at the Preston East Dome mine, was crushed by a locomotive in No. 204 crosscut on the 200-foot level about 8.30 A.M. on April 23 and died from his injuries on April 24, about 12.50 P.M.

Two 1½-ton "Mancha Little Trammers" are ordinarily used on the 200-foot level. On Good Friday, April 23, only Moses Beauchamp, the motorman of one crew, and McWhirter, the switchman of the other crew, came out to work. McWhirter was told to work with Beauchamp. Beauchamp was an experienced motorman. McWhirter had been employed underground at the Preston mine since March 3, 1943. His silicosis certificate shows that he was first examined in October, 1941, when he gave his age as 18 and the date of his birth as January 24, 1923. The card indicates that he worked two months on surface at the Pamour mine and one week, from April 16 to 23, 1942, at the Hallnor mine as a mucker. From May 13 to July 6, 1942, he worked in the crushing plant at the Buffalo Ankerite mine. From July 31, 1942, to February 22, 1943, he was employed underground at the Paymaster mine. When employed at the Preston mine he claimed to have had seven months' experience as a chute puller at the Paymaster mine.

About 8.30 A.M. on the day of the accident a car was required at the face of the 2nd waste-pass crosscut north of the 2nd main drive west. Beauchamp planned to take in a 20-cubic-foot car, which was standing in the 2nd by-pass drift about 80 feet from the junction of the 2nd main drive west and about 20 feet north of No. 204 crosscut. The 2nd main drive west and No. 204 crosscut are parallel drives 50 feet apart; the 2nd by-pass drift, driven in a northwesterly direction from the main drive west, branches off the main drive west at an angle of 60 degrees and intersects No. 204 crosscut at the same angle. The motor was brought to a point in the by-pass drift just south of No. 204 crosscut. McWhirter pushed the car south on the by-pass drift and in to No. 204 crosscut, to a point 8 feet east of the by-pass drift. Beauchamp then ran the motor across No. 204 crosscut to where the car originally stood, and McWhirter threw the switch and stepped back to the southeast corner of the intersection. Beauchamp ran the motor up to a point about 2½ feet from the car and stopped. He then took the coupling link, which was in the motor cab, and connected it to the motor bumper. Holding up the link in his left hand and with his right hand on the motor control, he backed up toward the car. As he was backing up he heard McWhirter yell and stopped the motor before reaching the car. He saw that McWhirter was caught between the motor and the south wall of the crosscut in a position facing the wall. Beauchamp reversed the control and moved the motor forward. This rolled McWhirter back to a position facing the motor and freed him. At the inquest into this accident the deceased's mother gave evidence that her son had told her that the motor had moved three times, rolling him first one way, then

back, and then the first way again, and that he (McWhirter) stopped the motor. Beauchamp denied the statement that McWhirter had stopped the motor.

Measurements made following the accident showed that McWhirter was squeezed in a 6-inch space between the motor and the wall. A foot and a half west of this point, toward the position where the motorman saw him last, the wall curves sharply away from the track to the southwest and 5 feet from the same point it turns back southeast. On the other side of the motor the clearance between the motor and the wall was 2 feet 9 inches; there was not a clear passage, however, as there was a chute at this side. The west end of the car to which the coupling was to be made was directly in front of the centre of the chute. If McWhirter intended to couple the car to the locomotive he could have done so better from the side on which the chute was located, by getting in between the first chute-post and the wall, where the clearance was about 21 inches. Beauchamp stated that it was the regular practice for the motorman to make the connection when cars were being connected to the rear end of the locomotive.

Following the accident McWhirter was taken to the station on the motor. At the station he walked about 40 feet, took a drink of water, and talked with his shift boss, who met him at this point. He was admitted to the South Porcupine General Hospital at 9.30 A.M. Dr. Paul, who examined him then, described his injuries as being numerous contusions on the back of both hands, the shoulders, and the right knee and extreme shock. He was X-rayed on admission to the hospital, and the results were negative. Two hours after his admission his condition was considerably improved, shock being greatly decreased. He was given a blood transfusion in the afternoon, and his condition appeared to improve further. Towards evening his abdomen appeared distended. He was examined at 5 A.M. and his condition found to be definitely worse, his abdomen being more distended and his pulse more rapid. He was kept under observation until 9 A.M. Then, following a consultation of doctors, an operation was performed. He died during the operation at 12.50 P.M. Dr. Paul, who performed the operation, found that McWhirter's liver was ruptured, a piece about an inch thick and as large as a saucer having been almost severed. Dr. Smith performed a post-mortem examination the same day and found that the injury was to the right lobe of the liver and that the injury was so severe, and in such a position, that nothing could have been done to save the injured man. Some haemorrhage of the surrounding tissue was also noted. No broken bones were found. Death was due to the ruptured liver and the resulting haemorrhage.

An inquest was held before Coroner Frank Evans at South Porcupine on March 19 at 3 P.M. The jury returned the following verdict:—

We, the jury, find that Gerald D. McWhirter came to his death on April 24, 1943, about 12.50 P.M., at the Porcupine General Hospital from haemorrhage and ruptured liver from injuries received at the Preston East Dome mine about 8.20 A.M., April 23, 1943, by being accidentally crushed between a motor and the wall of the drift.

Reliance Fluorspar Mining Syndicate

Charles Whiteman, aged 62, British, married with one dependent granddaughter, employed as a deckman at the No. 3 shaft of the Perry mine, operated by the Reliance Fluorspar Mining Syndicate, at Madoc, was fatally injured about 9.30 P.M. on January 24 and died in Belleville General Hospital about 8.30 P.M. on January 25.

No. 3 shaft is vertical. It has three compartments, the long axis lying approximately east and west. A pumping-compartment is at the west end, a hoisting-compartment in the centre, and a manway-compartment at the east end. The dumping- or tramming-deck is 12 feet above the surface collar.

Ore or waste is hoisted in half-ton buckets from the 120-foot level to the dumping position just above the tramming-deck at No. 3 shaft, where it is dumped into a 1-ton car and trammed to the mill or waste dump, as desired. At the tramming-deck collar, the hoisting-compartment is equipped with two flat counter-weighted doors hinged to the dividers and carrying the track, one rail on each door. The front or south end of the compartment is provided with a shaft gate. The two sides of the compartment have guard fences, and the back or north end of the compartment has a guard rail. At the surface collar the hoisting-compartment is provided with a shaft gate on the north end. The other three sides are boarded up. When a loaded bucket is in dumping position normal decking operations are as follows: The deckman closes the flat collar-doors, opens the shaft gate, pushes the car into position below the bucket, and dumps the bucket into the car by attaching a dump chain to a ring on the bottom of the bucket and signalling the hoistmen to lower the bucket. After the bucket is dumped, the deckman signals the hoistman to raise the bucket to the proper position, detaches the chain, pulls the car off the doors, closes the shaft gate, opens the flat collar-doors, and then signals the hoistman to lower the bucket back down into the mine. The deckman trams the loaded car to the mill or waste dump, as the case may be, dumps it, and trams it back to No. 3 shaft for another load.

On January 24, Whiteman came to work at about 9 P.M., an hour later than usual. He dumped one bucket of waste at No. 3 shaft into his car, trammed it a distance of about 200 feet to the waste dump, and dumped it. There was then evidently more of a delay in dumping another bucket at the shaft than Perry Brownson, the hoistman, thought was usual. He left the hoist-room to see if Whiteman had trouble with his car and needed assistance. Brownson went to No. 3 shaft intending to go up to the tramming-deck by way of a short ladder outside one corner of the shaft. When he arrived at the shaft he found that the shaft gate on the north end of the hoisting-compartment at the surface collar had been burst open by the car, which had fallen from the tramming-deck and had jammed in the timber across the northeast corner of the hoisting-compartment. The car had turned over end for end, so that the car door was at the north end of the compartment instead of at the south end. Whiteman was lying partly on and against the north end of the car and partly on the ground at the collar, with his feet protruding from the compartment. He was unconscious. He was taken to the hoistroom, and Dr. S. R. Beatty of Madoc was called. When the doctor arrived he examined Whiteman and took him to Belleville General Hospital by ambulance about 11 P.M.

Whiteman suffered lacerations of the face and head and internal injuries. He died about 8.30 P.M. on January 25. Death was due to severance of the spinal cord.

After the accident it was found that a loaded bucket of waste was hanging in the dumping position. The flat collar-doors were open as expected, but the shaft gate was also open and hooked in this position. It seems evident that Whiteman did not close the shaft gate but left it hooked open when he went to dump his first car of the shift. When he returned, pushing the empty car, he did not stop as usual at a sharp curve just south of the shaft but pushed the car around the curve into the open shaft and fell with the car down to the surface collar, where the car jammed in the timber.

An inquest was held before Coroner J. J. Robertson, M.D., in the Court House at Belleville on February 1 at 7.30 P.M. The jury returned the following verdict:—

That Charles Whiteman died in Belleville Hospital Monday, January 25, from injuries sustained while working as deckman at the Perry mine, Sunday, January 24. Injuries sustained through an accidental fall from the deck of No. 3 mine shaft at said Perry mine to the collar of the mine shaft.

Toburn Gold Mines, Limited

Anti Latvala, Finnish, aged 44, married, with three children, employed as a timberman at the Toburn gold mine, was fatally injured by a fall of rock in No. 1,021 stope, above the 1,018-foot level, at 8.30 P.M., March 24. He died about 9.20 P.M. He had been employed by Toburn Gold Mines, Limited, since May, 1931, and had left their employ in October, 1942, to go to Labrador, returning on January 29, 1943. He was considered one of the ablest and most careful timbermen in the mine.

No. 1,021 stope on the 9th level averages about 5 feet in width and dips at an angle of 65° S. During 1933 the stope was mined for a length of 60 feet at the level and up to a height of 65 feet above the rail. There are three chutes in the stope, one near each end and one at the centre. The west end of the stope was carried up vertically. As the east end was stepped over to the west as it was carried up, the length of the stope at the back was about 20 feet. A manway was carried up with the stope at the east end.

In February, 1943, mining was resumed in the stope and 135 tons of ore were broken in the back, breaking into the end of No. 1,018 stope, which lies to the west and has a flatter dip. The floor of a subdrift, driven in 1933 at a height of 47 feet above the level from the west end of No. 1,021 stope through to the east end of No. 1,018 stope, was slashed at an angle of 45 degrees so that muck could be drawn from No. 1,018 stope into No. 1,021 stope. In order to carry the muck into the centre chute a bulkhead was installed from the east side of the chute, sloping at an angle of about 70 degrees to the top of the second ladder of the manway at the east end of the stope.

Latvala had timbered and scaled in this stope on five different occasions since returning to the mine on January 29, his last work there being on March 6. On that date Latvala, Matronich, and the shift boss, A. Marino, scaled about a ton of loose rock off the margin of a distinct slip over the west chute extending into the hanging wall and into the west margin of the stope. There had been no work in the stope since then, although chutes had been pulled on March 8 and 9.

On the night shift of March 24, Marino sent Latvala to No. 1,021 stope with his partner, D. Wheeldon, and S. Costello, a mucker. He told Latvala to pull the chutes and, if necessary, to muck off the stope floor.

Latvala found the centre chute empty. He went up through the empty chute to the stope floor to look around and then returned to the drift. The men blasted the west chute with two sticks of powder. On returning to the stope Latvala told Wheeldon and Costello to remain in the drift while he went up to look around. This time he went up the manway. Costello and Wheeldon remained in front of the centre chute, talking. After about five minutes had elapsed they heard rock falling and Latvala shouting for help.

Latvala was found standing in the chute facing partly towards the west and partly towards the hanging wall at the south. He was pinned down by the right leg by a rock weighing about 1,500 pounds. Another rock weighing about 800 pounds was lying on the lagging against the hanging wall and partly overhanging the west side of the chute opening. Dr. Kelly was called and arrived about 8.50 P.M. He examined Latvala, who was still caught under the rock. Latvala was released about 9.15 P.M. and died shortly afterward.

It was found after the accident that the surface of the muck in the stope lay at an easy slope, rising to a crest about 8 feet above the stope floor halfway between the two chutes, and was lower over the west chute, which was blocked with large chunks and timber. About three feet above the crest of the muck and between the two chutes was a stull with a fresh gash in it. The eastern end of a place from which loose had recently been scaled or had fallen from the hanging wall was over the stull, about 12 feet above it. It would be almost impossible for anything falling west of the stull to slip or roll into the centre chute. There was no timber support of the hanging wall of the major part of the stope except fourteen staging sprags, the above-mentioned stull, and the inclined bulkhead for diverting muck into the centre chute. The slashed sublevel, down which muck from No. 1,018 stope had been pulled into No. 1,021 stope, could not be examined closely but appeared to have been scaled down to a smooth surface of broken rock wedged between the walls. It was not bulkheaded. The hanging wall over the centre chute contained some unsupported loose rock.

From Latvala's injuries it was evident that he had not sustained a severe fall nor been struck by the fall of either of the slabs of rock that were found in the chute with him. It is probable that he was injured by being pinned by the larger rock as it was sliding or rolling slowly. The injuries consisted of a fractured right leg about 4 inches below the knee, extreme laceration of the right groin, severance of the femoral artery, and fracture of the pelvis. Death was due to loss of blood and shock.

An inquest was held on March 31 before Coroner R. W. McBain, M.D., in the Town Hall at Kirkland Lake. The jury returned the following verdict:—

We, the undersigned jury, reached a verdict of accidental death of Anti Latvala at the Toburn mine in stope 1,021, March 24, 1943, at 8.40 P.M. Death due to fall of rock from unknown quarters, was caused by haemorrhage and shock.

Wright-Hargreaves Mines, Limited

Adolph David, employed as a timberman, aged 50, British (French-Canadian), married, without dependents, was instantly killed by a fall of ground in No. 701 E substope of the Wright-Hargreaves mine at 8 A.M. on June 8. He had been employed at the mine since 1930.

No. 701 E substope was mined to a height of 35 feet from a subdrift 60 feet below the 550-foot level. At this height the back of the stope was in waste. The width averaged 5 feet, and the inclination was vertical. A raise, inclined at 60° N., was then driven through from the back to the 550-foot level. Ore was found following a flat branch vein in the south wall; the footwall of the vein was 15 feet above the sublevel. The ore was stoped up at an inclination of 25 degrees over a distance of 35 feet along the strike and 23 feet up the footwall, where it was found to join with another vertical vein. The vertical height of the excavation at the junction with the vertical part of No. 701 E substope is 20 feet. A crosscut was then run south from No. 701 subdrift and No. 701 south-heading subdrift was driven. No. 701 south-heading substope, mined up from this subdrift, broke into the flat No. 701 E substope at an elevation of 25 feet above the subdrift. The junction of these two stopes is 33 feet in length with the brow 10 feet above the flat footwall of No. 701 E substope. A row of five vertical stulls was placed to support this brow. No. 701 south-heading substope was then mined and timbered through to the 550-foot level, and the muck was removed.

Three additional stulls had been placed on the foot of the flat No. 701 branch substope, two supporting the back and one angling north to support the vertical

north wall of No. 701 substope. All stulls had 4-inch plank headblocks 4 feet long.

David had worked in these two stopes intermittently for 12 months. On June 7, he and his helper, J. A. Comtois, were employed cleaning off the footwall of the flat part of No. 701 substope. At noon of that day David sounded the back at the brow between the two stopes at the point where the ground subsequently fell. This point is between the 2nd and 3rd stulls in the row of five stulls. Since this stope is worked on one shift only, David and Comtois continued with the same work on June 8. At 8.15 A.M. David was mucking on the footwall about 5 feet north of the 3rd stull when he was struck by a block of ground which fell from the back between the 2nd and 3rd stulls, which were 6 feet apart. The fresh surface showed two slip surfaces. The east end of the fresh surface came to the 2nd stull headblock, and the west end to a point about 2 feet east of the 3rd stull headblock. The block that struck David was irregular in shape and roughly 1 foot 6 inches wide by 4 feet long and 1 foot 6 inches thick. Several other smaller pieces were noted to have fallen at the same time, probably having broken off the larger block when it struck the footwall.

Comtois obtained the assistance of two miners in No. 702 stope, some distance to the west. By the time the doctor arrived in the stope at 8.30 A.M. the men had succeeded in prying up the block sufficiently to release David, who was dead.

After the accident it was found that the 3rd stull, which is the one adjacent on the west to the ground that fell, had been placed on a footblock, on at least 6 inches of fine muck. Muck had been removed by David and Comtois quite close to this footing on the lower or north side. It may be possible that the removal of the muck caused sufficient movement of the stull to loosen the back.

David sustained the following injuries: neck and back broken, left side of chest crushed, left arm broken, pelvis crushed. Death was instantaneous.

An inquest was held on June 16 at 7.30 P.M. in the Kirkland Lake Municipal Hall before Coroner R. W. McBain, M.D. The jury returned the following verdict:—

> We, the jury, empanelled to enquire into the death of Adolph David, find that Adolph David came to his death in 701 E substope at the Wright-Hargreaves mine at about 8 A.M. in the morning of June 8, 1943, due to a fall of rock from the brow of the stope, which struck him and pinned him down, crushing his left chest and fracturing his neck and back. Accidental death.

George Ojala, a trammer, was fatally injured when he was buried in a run of sand fill in No. 1,304 substope of the Wright-Hargreaves mine at 9.45 A.M., October 18.

Ojala, Finnish, aged 42, married with no children, had been employed underground at the Wright-Hargreaves since October, 1935.

No. 1,304 shrinkage stope was mined except for a sill pillar 120 feet long with a maximum depth of 40 feet below the 1,250-foot level. Mining and pulling were completed some years ago. About 18 months ago an approximately vertical fill fence was timbered from the 1,375-foot level to the west end of the sill pillar. That part of No. 1,304 stope west of the fill fence was filled with sand and waste rock and a sublevel established under the pillar. An inclined bulkhead was laid at a point 70 feet east of the fill fence from the sublevel to the 1,250-foot level, and the filling of the remainder of that part of No. 1,304 stope completed to the 1,250-foot level. The bulkhead also served as a mining-floor for the sill pillar, the mining of which was commenced from the east end. The

muck was pulled on the sublevel from two timbered chutes: No. 2 was next to the bulkhead, and No. 1 was 14 feet farther west and 8 feet east of the east end of the pillar. Muck was dumped into the open stope west of the fill fence, the stulls of which were protected from the falling broken muck by a 10-foot plank apron inclined slightly from the vertical. A 60-foot length of the sill pillar had been mined at the time of the accident. Entrance to the stope subdrift is gained through a break-through from the sublevel into No. 1,308 raise 8 feet in the south wall. At the fill fence the stope is about 6 feet wide.

On the day shift of October 18, G. Ojala and C. Johnston were to tram muck from the sublevel chutes.

L. Podlugar, timberman, and S. Novisel, his helper, were engaged in timbering over the broken sill-muck.

At 8 A.M., after Mine Captain J. Newman and Shift Boss H. Gauld had visited the stope, Podlugar told Ojala to pull No. 2 chute. Previously Ojala and Johnston had been pulling No. 1 chute.

Podlugar and Novisel state that they heard regular chute-pulling until 10.30 A.M. They went to dinner at 10.50 and at 11.05, respectively; when Johnston and Ojala had not come to dinner, Podlugar sent Novisel to investigate. Novisel found that the fill of the sublevel over a length of 11 feet from the dump had subsided. The track was still in place, and the car was about 3 feet from the dump. He heard Johnston calling for help, below him.

He summoned Podlugar, B. Larocque, and A. McDougal, who went into No. 1,304 stope to commence recovery operations, and then he went to the shaft for more aid. Gauld and Newman arrived almost at once and also W. Sampson, mine superintendent.

They found that at about 20 feet below the sublevel elevation, a break had occurred in the fill fence, allowing the sand and rock fill to run into the open stope. Johnston was standing upright along the north or hanging wall; Ojala was in a bent-over or sitting position south of Johnston, a rock weighing about 100 pounds pressing on his head. This rock was also pressing into Johnston's stomach, wedging him against the wall and partially supporting his weight. Both then were pressed against the inside of the fill fence. Some sand was over Johnston's head. One of Ojala's hands was protruding below the end of a lining-plank.

Ojala was found to be dead. Johnston was removed at 1.15 P.M. and Ojala at 1.45 P.M.

Johnston says that he was standing on the fill at the rear of the car and on the north side, in the act of latching the car door, when the subsidence occurred. Ojala was standing opposite him on the south side. Neither man was on the track. Johnston does not know what caused the rupture of the fill fence.

The fill fence consists of 8-foot planking, 3 by 8 inches, nailed to stulls; stulls are not placed at exactly uniform distances, so the amount of overlapping varies. The 4th set of lining is offset about 2 feet to the west. As nearly as can be ascertained, 3 stulls became displaced: the top stull of the 4th set (offset); the bottom stull of the 3rd set; and the top stull of the 3rd set. The top of the 3rd set of lining extended 3 feet above the top stull of the set and was held in place by a sprag, which was 3 feet below the lower stull of the set above. The location of the stull holding the top of the 3rd lining-set could be seen from the mark of the headblock on the hanging wall. The position of the lower stull of this set could not be ascertained because of the overflow of sand. The 4th (or offset) set of lining hinged on its bottom stull was pushed out at the hanging

side on the top to rest against a sprag 3 feet to the west. The lining on the footwall side was more nearly in a vertical position.

A search was made of the surface of the overflow sand and muck in the open stope for the missing stulls, but none could be found of approximately the correct length. They could easily have been covered in the run of fill.

No definite cause could be given for the rupture or displacement of these stulls. The stulls and the lining that could be examined were sound.

Ojala's death was ascribed to suffocation. He had several abrasions on the left side of his forehead.

The inquest was held on December 1 at 9 P.M. in the Kirkland Lake Municipal Hall before Coroner R. W. McBain, M.D. The jury returned the following verdict:—

We, the jury empanelled to enquire into the death of George Ojala, find that he came to his death in 1,304 substope at the Wright-Hargreaves mine, Kirkland Lake, Ont., at about 11 A.M. on October 18, 1943, from suffocation caused by being buried in a run of backfill, which occurred shortly after 10 A.M. through failure of a bulkhead. We are unable to determine the cause of the failure of the bulkhead and find death to be accidental.

METALLURGICAL WORKS

Algoma Steel Corporation, Limited

Andrew Yule, British, aged 45, single, employed as a millwright's helper in the blast furnace department of the Algoma Steel Corporation, Limited, was fatally injured about 8.20 A.M. on March 4, when hit by a scale car in No. 4 blast-furnace stock-house. He died in the Sault Ste. Marie General Hospital about forty minutes later.

An electrically driven scale-car is operated between the various stock-chutes and the dump. Ore and flux are loaded from the stock-chutes into the car hopper and weighed. At the dump they are discharged into the blast-furnace skips. The car, which is about 19 feet long and 9 feet wide, runs northward from the stock-chutes to the dump. The electric controller is at the southeast corner of the car, from which position the operator is unable to see the west side of the track for a distance of about 25 feet north of the car, owing to the height of the hopper. The entrance to the stock-house is located on the west side of the building, about 14 feet from the scale-car track and midway between the stock-chutes and the dump. An interior wall on the north side of the entrance extends to within 2¼ feet of the track, leaving a clearance of 19 inches for the car, then parallels the track northward past the dump. The wooden floor of the stock-house is about 7½ feet above ground level.

Arrangements were made for the department millwrights to replace worn steel liners in the dump-chute on March 4. This work was to be done during the intervals between furnace-charging cycles, when the scale car would not be in operation.

The millwright foreman, W. Swinn, sent his crew of eight men to the stock-house shortly before 8 A.M. on March 4. He intended to take charge of the job, but before reaching it was called to No. 3 furnace. He assumed that the senior millwright, H. Frech, would take charge in his absence. The scale car was not in operation, and the operator was missing when the crew arrived at the stock-house. Three of the crew started to clean up around the dump, while the others assembled the necessary tools and materials. Two of the latter, A. Miron and his helper, A. Yule, tested cylinders of acetylene and oxygen located underneath the stock-house floor, immediately north of the entrance stairs, preparatory to burning out the liner bolts with a torch. Miron laid the torch hose-lines up the

entrance stairs and into the stock-house. Yule suggested that the tripping hazard created by the hoses could be reduced if they were put up through a hole in the floor that he had noticed at the point where the interior wall turns northward. Miron agreed with this suggestion and started to roll up the hoses. He left Yule beside the hole and did not see him again until after the accident had occurred.

The scale-car operator, M. Reid, left the stock-house about 7.45 A.M. after completing a furnace charge. He returned about 8.15 A.M. and found H. Frech, E. Hill, and F. Schiller working around the dump. He advised them that another furnace charge was required. Frech told him that he could put the scale car in operation immediately. Frech and Hill then left the stock-house without seeing Yule or Miron. Schiller remained to do some work in connection with the new liners, which were lying on the floor between the entrance and the track. Reid had made a return trip from the stock-chutes to the dump and was making up his second load when Yule entered the building. Schiller saw him go over to the hole in the floor, then leave the building. Yule apparently re-entered the building almost immediately and returned to the hole in the floor without being seen by anyone. Reid completed his load at a stock-chute about 40 feet south of the dump and then put the car in motion northward. The car hit Yule after it had moved about 22 feet, crushing him against the wall paralleling the track. A long rat-tailed spanner was found underneath him. No one had warned Yule or Miron that charging operations had been resumed.

Yule sustained crushing injuries to the thorax and abdomen, a puncture wound in the groin, and a fractured skull. A post-mortem examination revealed a ruptured spleen, a torn liver, and a torn femoral artery and vein.

An inquest was held by Coroner J. E. Gimby, M.D., at Sault Ste. Marie on March 12. The jury returned the following verdict:—

We, the jury selected to enquire into the death of Andrew Yule, employed at the Algoma Steel Corporation as a millwright's helper, find that he came to his death on March 4, about 8.20 A.M., at No. 4 blast-furnace stock-house by being hit by a scale car, crushed between car and wall, and pierced by a rat-tailed spanner wrench. We attach no blame to anyone in particular but recommend that better and more definite rules of responsibility be adopted and enforced. The cause of death was shock and haemorrhage.

Canadian Furnace, Limited

Frank Hawkins, aged 54, British, married, with seven children (two dependent), employed as an electrician at the plant of Canadian Furnace, Limited, Port Colborne, fell and fractured his left leg above the ankle and dislocated the left foot while going to his work after checking in at the time office at 7.43 P.M. on February 5. He was walking toward the electric shop and fell at the top of three steps, sliding to the bottom, a drop of about 18 to 24 inches. He called for help and two employees came to his aid about 8 P.M., got a stretcher, and carried him to the time office.

Dr. E. A. MacKenzie was called and ordered Hawkins to be taken to the Welland General Hospital for an X-ray. Hawkins appeared to be comfortable at 3.20 A.M., February 6. He died between 3 and 5 A.M. the same day.

An inquest was held in the Town Hall at Port Colborne before Coroner G. N. Black, M.D., at 2.30 P.M., February 17. The jury's verdict was as follows:—

We are of the opinion that Frank Hawkins died at the Welland Hospital at about 4 A.M. on February 6, 1943, as a result of congestion of his lungs, produced by the shock and heart strain resulting from the fractures of his leg. His obesity and previous heart enlargement were contributing factors. From the evidence we conclude that the fracture of his leg resulted from a fall on an icy sidewalk at the plant of the Canadian Furnace Company at about 8 P.M. on February 5, 1943. We recommend that the stone walk upon which the deceased was walking be more efficiently lighted.

Falconbridge Nickel Mines, Limited

Romeo Legault, British (French Canadian), aged 36, married, employed as a smelter labourer, was killed about 7.25 A.M. on July 8, when run over by an empty charge train on the blast-furnace charging-floor.

The charge trains operate on 24-inch-gauge tracks, and transport coarse ore, sinter, converter slag, limestone, and coke from storage bins to the blast furnaces. The sinter bins are located between the other bins and the furnaces. The loading track is on the east side of the 5 hopper-type sinter bins, which are numbered from north to south. The return track passes under these bins, 6 feet west of and parallel to the loading track. This area is adequately illuminated by electric lights. A charge train consists of nine or ten Hudson-type cars pulled by a 6-ton Goodman trolley locomotive. The latter is equipped with headlight, bell, and hand brake.

Legault was working on the midnight to 8 A.M. shift on July 8. It was his second shift following employment by the company, both of which were spent in cleaning up the charging-floor. His subforeman, Frank Bailey, put him to work under the sinter bins about 5.30 A.M., after cautioning him to watch out for the trains. Hector Roy was cleaning up in the same area.

Roy was working under No. 1 bin about 7.25 A.M., when he heard the bell ringing on a train approaching from the south on the return track. Another train was pulling up under the sinter chutes on the loading track at that time. He saw Legault standing just outside the east rail of the return track, under No. 2 bin and facing the loading track. He yelled at him to stand clear. Legault stepped backwards into the path of the approaching train, which was then very close to him. He was knocked down and dragged for a distance of 92 feet before the train was stopped. The locomotive and one car had passed over him. He was conscious when reached, but died within a few minutes.

The train is estimated to have been travelling at a speed of 6 to 8 miles per hour when it hit Legault. The motorman, Albert Land, applied his brake when he saw Legault step on the track. He had started ringing the bell as a precautionary measure when the train was some distance south of No. 5 sinter bin. The brake was found to be in good order when examined after the accident.

An inquest was held by Coroner H. M. Torrington, M.D., at Falconbridge on August 12. His verdict was as follows:—

Romeo Legault came to his death on the 8th July, 1943, at the smelter, Falconbridge mine, due to multiple fractures of legs, head, and chest, by being run over by the engine and one car on the charge tracks on the smelter charge floor. Legault had been cleaning on the tracks and evidently did not hear or see the oncoming train, although the headlight of the engine was lighted and the engine bell was ringing. Accidental death.

International Nickel Company of Canada, Limited

Harry Pozdyk, British, aged 19, single, employed as a roofman, and Valmore Bertrand, British, aged 38, married, employed as a slagman, were fatally burned at the Copper Cliff smelter about 9.50 P.M. on January 19, when about 20 tons of molten matte was explosively ejected from No. 19 converter. Pozdyk died in the Copper Cliff Hospital on February 23. Bertrand died in the same hospital on April 3. Death was attributed in both cases to toxaemia induced by multiple burns.

Four 13- by 35-foot Pierce-Smith converters, Nos. 17 to 20, are in use for converting copper. They are located in line along the south side of the crane aisle. The burner ends of two copper reverberatory furnaces, Nos. 8 and 9, adjoin the north side of the aisle, with No. 9 furnace almost directly opposite No. 19 converter. The north side of the aisle is open at the reverberatory floor,

which is 12 feet above the aisle floor, and at about the same elevation as the skimming-platform on the converters. At the time of the accident, a salamander was located on the reverberatory floor in front of No. 9 furnace, underneath the slag launder platform, about 50 feet from No. 19 converter.

A fresh charge was started in No. 19 converter at 10.50 A.M. on January 19. It was found to be high in copper content when tested by the skimmer, G. Flannery, at 8.30 P.M. that evening. He turned the converter off the tuyères at 9.25 P.M., after blowing for 50 minutes, and poured off a pot of slag. Flannery turned the converter on the tuyères at 9.35 P.M. and signalled for a ladle of furnace matte. He then went up on the west hood platform to observe the amount of matte in the ladle when it arrived, so that he could estimate the amount of flux required to complete the charge. No. 6 crane, operated by G. Watkinson, arrived at 9.50 P.M. with a ladle of matte from No. 9 furnace. The converter was turned off the tuyères by T. Istoni, a puncher, and Watkinson started to pour the matte into it. He saw the charge react violently and put the crane controls in neutral, then ran up the ladder to the bridge. An explosion occurred inside the converter, violently ejecting about half of the 40-ton charge. It landed on both the aisle and reverberatory floors, covering an area of about 2,500 square feet with molten matte. The crane cab was set on fire by flying matte.

Watkinson was slightly burned and partially asphyxiated by fumes. Flannery was moderately burned by flying matte. Istoni escaped injury. The other punchers were not in the vicinity, having been warned to stand clear before pouring commenced.

H. Pozdyk, V. Bertrand, and R. Lacombe were standing or sitting beside the salamander on the reverberatory floor when the explosion took place. They were all employed on No. 9 furnace. Some of the flying matte landed on them, setting fire to the clothing worn by Pozdyk and Bertrand. Pozdyk and Bertrand were fatally burned. Lacombe was only slightly burned.

It is believed that the explosion was caused by an unusually sudden liberation of sulphur dioxide from the chemical reaction between the sulphides in the furnace matte and the oxides in the converter charge. It is customary for some sparking or foaming to take place from this reaction when the charge is high in copper content. The rate of this reaction is increased if the matte is poured in rapidly. Some other circumstance, however, which could not be determined, was apparently responsible for the violent reaction in this instance. A yellow light, located on the skimming stand, was turned on at 8.30 P.M. to notify the crane operator that the charge was high in copper content. Wilkinson saw this light and had just started to pour the matte in slowly when the explosion took place. The ladle, which holds 16 tons of matte, was three-quarters full afterwards.

A signal system has since been installed whereby audible and visual warning is given to anyone on the copper-reverberatory floor when furnace matte is about to be poured into a high-copper converter charge, and continues in operation until the converter is turned on the tuyères.

An inquest was held by Coroner H. M. Torrington, M.D., at Copper Cliff on April 15. His verdict was as follows:—

Harry Pozdyk came to his death on February 23, 1943, at Copper Cliff Hospital, Copper Cliff, from toxaemia, the result of deep burns received on January 19, 1943, at the copper converter building, International Nickel Company, Copper Cliff, the result of an explosive vomiting of hot matte from converter No. 19. The cause of the explosion was probably due to the rapid formation of gas in converter No. 19 when matte was poured into this converter when the contents of converter No. 19 was of high copper content, causing gas, quickly formed, to spew out matte into the converter building, causing Pozdyk's clothes to catch fire. Valmore Bertrand died April 3 as a result of this same accident. Accidental death.

Albert Belisle, British, aged 27, married, employed as a labourer at the Copper Cliff smelter, was fatally burned about 12.55 A.M. on October 19, when about six tons of molten slag was explosively ejected from a slag pot during skimming operations at No. 2 reverberatory furnace. He died in the Copper Cliff Hospital about six hours later.

This 28- by 114-foot furnace is one of seven in the nickel reverberatory building. They are located side by side, about 50 feet apart, and are numbered from west to east. The slag is skimmed off at the north end of the furnaces into pots holding about 16 tons, which are mounted on railroad trucks. The main slag track runs down the centre of the aisle at the north end of the furnaces. A siding runs underneath the skimming-platforms on the south side of the aisle. The platforms are 35 feet in length and about 13 feet above the aisle floor. A curtain of splash plates is suspended from the north side of each platform, with the lower end about 2½ feet below the top of the pots and about 6¾ feet above the aisle floor. Trains of empty pots returning from the slag dump enter the west end of the building and proceed to the east end of the siding, where 14 pots are usually switched into the siding from each train. An electrically operated winch at the west end of the siding pulls 6 of these pots down to furnaces Nos. 1 to 3, where 2 are filled at each furnace. It then moves them to the west end of the siding, where they are picked up by the trolley locomotive. The winch is operated from a control house on the north side of the main track in front of No. 2 furnace.

Albert Belisle and John Boychuk were moving the pots with the winch on the midnight to 8 A.M. shift on October 19. A. Ceppettelli, assisted by A. Carroll and W. Lalonde, skimmed off three pots of slag from No. 2 furnace without incident between midnight and 12.45 A.M. They were skimming off the fourth pot about 12.55 A.M., when a loud explosion occurred in the partially filled pot. The slag in the pot was thrown violently over the control house and aisle floor, covering an area of about 1,300 square feet. Four splash plates, forming the centre section of the curtain, were thrown for distances as much as 25 feet from their original position.

Belisle and Boychuk were in the control-house when the explosion occurred. Some of the slag came through a doorway facing the furnace and landed on them. They rushed out and ran westward with their clothing on fire. Belisle was fatally burned. Boychuk was very severely burned.

The exhaust hood over the discharge end of the slag launder was knocked to one side by the explosion, and some slag landed on the men working on the skimming-platform. Ceppettelli was moderately burned. Carroll and Lalonde were slightly burned.

The cause of the explosion has not been determined.

An inquest was held by Coroner G. A. Henry, M.D., at Copper Cliff on March 16, 1944. His verdict was as follows:—

That Albert Belisle died at Copper Cliff on October 19, 1943, as a result of being struck by molten slag following an explosion in a slag pot, which was being filled about six hours previously at the Copper Cliff smelter. From all the evidence submitted no blame seems to attach to anyone.

QUARRIES

Frazer Duntile Company, Limited

Joseph St. Laurent, aged 39, British, married, with four children, employed as a labourer at the quarry of the Frazer Duntile Company, Limited, Westboro', was buried in a bin of crushed stone about 1 P.M. on January 8.

The Frazer Duntile Company, Limited, operates a limestone quarry on Clyde Avenue in Westboro'. The rock from the quarry is put through a jaw-crusher, then through a hammer mill. It is raised in a bucket elevator to a revolving screen. Here it is separated into 6 sizes: dust, rice, pea, 5/8-inch, 7/8-inch, and tailings, or large. The materials run to their respective bins below the screen. The building housing the screen and bins runs east and west. The rice-size material runs to a bin 9 feet 10 inches long by 7 feet 3 inches wide by 13 feet 4 inches deep in the southeast corner of the building. All bins have a flat concrete bottom, and there is a 10- by 14-inch steel chute in the centre of each bin to empty the materials.

At lunch hour (12 to 1 P.M.) on January 8, the rice bin was full. The foreman, E. Chartrand, told Joseph St. Laurent and the truck-driver, Rene Jean Louis, to draw out enough material to allow the plant to continue working after lunch.

About 12.50 P.M. St. Laurent and the truck-driver filled a 5-ton truck. As the material was not running freely, St. Laurent went up the stairs to the bin to start it running again. He used a 9-foot drill-steel for the purpose. Apparently he dropped it, and it fell down into the mouth of the chute. The truck-driver asked St. Laurent to pull up the bar so that he could close the chute. He received no reply. At this time, about 1 P.M., the foreman and men came back to the quarry after lunch. They stopped at the bin and helped the driver close the chute gate. The foreman wanted St. Laurent to help him and sent Phillip Lauzon up to the top of the bin to get him. Lauzon reported he was not there. About 1.20 P.M. the foreman learned from the truck-driver that he had seen nothing of St. Laurent since he had gone up to the top of the bin before 1 P.M. They concluded that St. Laurent must have fallen into the bin. They opened the chute gate and allowed the material to run out on the ground. Meanwhile men were sent up into the bin to see if they could locate the missing man. In a few minutes the foreman felt part of St. Laurent's body directly above the chute. He was uncovered about the same time from above. Dr. L. Derby was called and arrived as St. Laurent was being taken out. The doctor examined him and found that he was dead.

It has been the practice at this property to send at least two men into the bins when work was being done in them.

Apparently a previous load that was drawn had funnelled out of the centre but left the top crusted over. St. Laurent's bar may have broken through the crust and fallen from his grasp. He may have tried to recover the bar and have fallen down into the opening and been covered by the material.

An inquest was held in the Court House at Ottawa before Coroner J. S. Nelson, M.D., at 8 P.M., January 15. The jury's verdict was as follows:—

We, the jury empanelled here to inquire into the death of Joseph St. Laurent, find from the evidence given that Joseph St. Laurent came to his death on January 8, 1943. Death was caused by asphyxia, when buried by loose stone. This accident occurred at the Frazer Duntile plant on Carling Avenue, Nepean township. We recommend that some safer method be found for loosening the blocked chutes.

CLAY, SAND, AND GRAVEL PITS

Consolidated Sand and Gravel Company, Limited

Lorne Charters, aged 65, British, married, employed as a fireman on a steam crane since February, 1943, at the sand and gravel plant of the Consolidated Sand and Gravel Company, Limited, Waterford, was instantly killed when the crane fell on him at about 2 P.M. on September 3.

The Consolidated Sand and Gravel Company, Limited, operates a sand and gravel plant at Waterford. A link-belt, 74-ton, steam-operated crane is used to load and unload cars of sand and gravel. Wm. England had operated the crane from July, 1943, until the day of the accident. Lorne Charters had fired the boiler on the crane since February, 1943. The crane was operating on standard 4-foot 8½-inch gauge tracks. The boom was 50 feet long. The clam or bucket weighed 4,600 pounds. The capacity of the bucket was 1¼ cubic yards of sand, which weighs approximately 3,500 pounds. The capacity of the crane was 1,100 pounds at 50 feet (horizontal distance from centre-line of crane), or 8,500 pounds at 40 feet.

On September 3, the crane was moved up to a stock pile of sand and the loading of a car was commenced. The car and crane were standing on tracks running east and west. The crane was west of the car to be loaded. The sand was stock-piled on the northwest side of the crane. England had put 8 or 10 buckets in the car and was swinging the next bucket. About midway in the swing the crane toppled over on its side on the north side of the tracks. Charters was caught under the crane and instantly killed. England pulled himself out of the cab through a window.

Dr. Winston Sutherland was called and pronounced Charters dead. Upon examination after the accident the rails on the track were found to be in good condition. The ¾-inch steel cable was in good condition. The boom was out about 38 feet when the accident occurred.

An inquest was held in the Town Hall at Waterford before Coroner Winston Sutherland, M.D., at 2 P.M., September 10. The jury's verdict was as follows:—

We, the jury, find that Mr. Lorne Charters of the village of Waterford, age 65, employee of the Consolidated Sand and Gravel Company, came to his death on the third day of September, 1943, while firing a steam-propelled crane, caused by the crane tipping over on him while in operation, reasons being accidental from evidence given.

John Hinch's Gravel Pit

John Willett, aged 70, British, single, employed as a labourer in a gravel pit on the farm of John Hinch, on lot 22, concession VIII, Hungerford township, Hastings county, was instantly killed about 3.30 P.M., on October 6, when he was struck by a chunk of clay and loam, which rolled down the face of the pit and threw him against a truck.

The gravel pit has been operated for about eight years. At the time of the accident the face was about 10 feet high. On October 6 the Township of Hungerford employed four men and a truck driver to haul gravel for the roads from this pit. Seven loads (about 28 yards) of gravel had been hauled out that day. About 3.30 P.M. the truck backed in for a load and the men had just started to load it when about 1½ to 2 yards of material on the north bank rolled down. Apparently a chunk of material hit the shovel John Willett was using. The shovel handle struck him, breaking his nose and causing him to fall backwards and hit the back of his head on the steel frame of the truck. The skull was fractured. Willett's legs were covered with about a foot of material. Dr. McCue was called and pronounced him dead.

An inquest was held in the Township Hall at Tweed at 7.30 P.M. on October 15 before Coroner M. G. Dales, M.D. The jury's verdict was as follows:—

We, the jury, find that John Willett came to his death in the township of Hungerford in the county of Hastings on October 6, 1943, while working in the gravel pit known as Hinch's pit in the township of Hungerford. We find that death was accidental. We also find that the township officers used usual precautions in keeping working conditions safe for their employees.