PROVINCE OF ONTARIO
DEPARTMENT OF MINES

HON. CHAS. MCCREA, *Minister* THOS. W. GIBSON, *Deputy Minister*

Bulletin No. 71

REPORT

ON THE

Mining Accidents in Ontario

in 1929

By

Chief Inspector of Mines: D. G. SINCLAIR, Toronto
Inspectors: E. C. KEELEY, Kirkland Lake; G. S. JARRETT, Sudbury;
R. H. CLELAND, Timmins; A. R. WEBSTER, Toronto

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To the Honourable Chas. McCrea,
Minister of Mines.

Sir,—I beg to hand you herewith report by the Inspectors of this Department on the fatal accidents in the mines, metallurgical works, and quarries of Ontario during the year 1929.

I have the honour to be, Sir,

Your obedient servant,

T. W. Gibson,
Deputy Minister of Mines.

Department of Mines,
Toronto, February, 1930.

MINING ACCIDENTS IN ONTARIO, 1929

Chief Inspector of Mines, D. G. Sinclair, Toronto; Inspectors, R. H. Cleland, Timmins; E. C. Keeley, Kirkland Lake; G. S. Jarrett, Sudbury; A. R. Webster, Toronto.

Accidents during 1929

During the year 1929 at the mines, metallurgical works, quarries, clay, sand and gravel pits regulated by the Mining Act, there were 2,444 accidents to employees reported to the Department of Mines up to January 15, 1930. Fifty-five fatalities, arising out of forty-eight separate accidents, were recorded.

These returns represent a decrease of 115 in the total number of casualties and a decrease of 30 in the number of men killed over the record of the preceding year, 1928. It should be noted, however, that the number of fatalities in 1928 was abnormally high due to the death of 39 men in the Hollinger Mine disaster of that year.

The report shows a fatality rate of 2.89 per thousand men employed, which is 0.13 per thousand lower than the average rate for the past twenty-five years.

There were 126 non-fatal accidents per thousand men employed, which shows a decrease of 15 per thousand men from the rate in 1928.

The percentage of non-fatal accidents followed by infection decreased from 10.7 per cent. in 1928 to 6.9 per cent. in 1929.

Workmen's Compensation Rates

The assessment per $100 of pay-roll made by the Workmen's Compensation Board is based on the actual cost of the accidents occurring in each class during the previous year, and consequently shows the accident hazard of each class.

The rates for the years 1925 to 1929, inclusive, were as follows:—

Schedule	1925 Adjusted	1926 Adjusted	1927 Adjusted	1928 Adjusted	1929 Provisional
Silver mining	$3.00	$3.00	$3.00	$2.50	$2.50
Treatment of ores, with heat, in a silver-mining industry	1.50	1.50	1.50	1.25	1.25
Treatment of ores, without heat, in a silver-mining industry	.75	.75	.75	.60	.60
Gold mining	3.00	4.00	4.50	5.00	5.00
Treatment of ores, with heat, in a gold-mining industry	1.50	1.50	1.50	1.60	1.60
Treatment of ores, without heat, in a gold-mining industry	.75	1.00	1.00	1.00	1.00
Nickel or nickel-copper mining	4.00	4.00	3.00	3.50	3.50
Treatment of ores, with heat, in a nickel or nickel-copper mining industry	2.00	2.00	1.50	1.50	1.50
Treatment of ores, without heat, in a nickel or nickel-copper mining industry	.90	.90	.75	.75	.75
Mining N.O.S.	4.00	4.00	4.00	3.50	3.50
Treatment of ores or minerals, with heat, in an industry in this group	2.00	2.00	2.00	1.50	1.50
Treatment of ores or minerals, without heat, in an industry in this group	.90	.90	.90	.75	.75
Iron smelting, as a business	1.50	2.00	2.00	3.00	3.00
Treatment of ores or minerals, with heat, N.O.S., as a business	1.50	1.50	1.00	.80	.80
Treatment of ores or minerals, without heat, N.O.S., as a business	.50	.50	.50	.40	.40
Refining of nickel, as a business	2.00	2.00	1.50	1.20	1.20
Sand, shale, clay, or gravel pits	3.50	4.50	4.50	5.50	5.50
Quarries, as a business; stone crushing	5.00	5.00	6.00	5.00	5.00

Fatal Accidents

A comparison of fatal accidents for the past five years is given in the following table:—

Distribution	1925	1926	1927	1928	1929
Mines, underground	30	20	19	31	33
Mines, surface	1	3	4	2	2
Metallurgical works	2	3	3	4	2
Quarries	7	3	4	2	3
Clay, sand, and gravel pits	2	3	3	4	8
Total	42	32	33	43	48

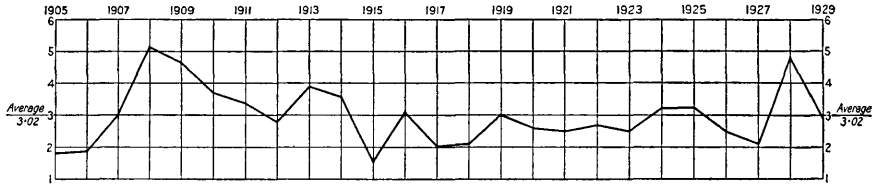


Diagram showing fatalities per thousand men employed between the years 1905 and 1929.

By months the fatal accidents occurred as follows:—

Month	Number Accidents	Number men killed
January	5	5
February	4	4
March	0	0
April	3	5
May	4	4
June	4	4
July	5	5
August	3	4
September	5	5
October	3	3
November	3	4
December	9	12
Total	48	55

Classifying the fatalities according to industries gives the following:—

Gold Mines	17
Nickel Mines	19
Silver Mines	4
Copper-Lead-Zinc Mines	1
Gypsum Mines	1
Metallurgical Works	2
Quarries	3
Sand, Gravel and Clay Pits	8
Total	55

ANALYSIS OF FATALITIES AT MINES, 1925-29

Cause	1925	1926	1927	1928	1929
	per cent.	per cent.	per cent.	per cent.	per cent.
Fall of ground	19.35	17.39	26	6.6	14.3
Run of ore or rock	.....	.....	17.4	5.3	11.9
Shaft accidents	19.35	26.09	21.3	9.3	14.3
Explosives	25.8	43.48	4.3	12	28.6
Miscellaneous, underground	29.03	.....	8.69	64	28.6
Surface	6.45	13.04	21.7	2.6	2.3

TABLE OF FATAL ACCIDENTS IN MINES, METALLURGICAL WORKS, QUARRIES AND GRAVEL, SAND, AND CLAY PITS, 1905–1929

Year	Persons killed at metallurgical works and mines	Persons employed at metallurgical works and producing mines	Persons employed at non-producing mines (estimated)	Total persons employed	Fatal accidents per 1,000 employed
1905	9	4,415	500	4,915	1.83
1906	11	5,017	750	5,767	1.9
1907	22	6,305	1,140	7,445	2.93
1908	47	7,435	1,750	9,185	5.11
1909	49	8,505	2,000	10,505	4.66
1910	48	10,862	2,000	12,862	3.73
1911	49	12,543	2,000	14,543	3.37
1912	43	13,108	2,000	15,108	2.84
1913	64	14,293	2,000	16,293	3.93
1914	58	14,361	1,500	15,861	3.6
1915	22	13,114	1,500	14,614	1.51
1916	51	14,624	2,000	16,624	3.07
1917	36	16,791	1,000	17,791	2.02
1918	32	14,726	500	15,226	2.1
1919	39	11,926	1,000	12,926	3
1920	29	10,486	1,000	11,486	2.61
1921	24	8,436	1,000	9,436	2.54
1922	30	9,500	1,500	11,000	2.72
1923	30	10,500	1,500	12,000	2.5
1924	40	11,000	1,500	12,500	3.2
1925	42	11,500	1,500	13,000	3.23
1926	32	11,500	1,500	13,000	2.46
1927	33	13,311	2,000	15,311	2.1
1928	85	15,787	2,000	17,787	4.76
1929	55	17,145	1,849	18,994	2.89

Comparative fatality rate per thousand men employed at mines, metallurgical works, quarries, clay, sand and gravel pits:—

	Men employed	No. killed	Rate per thousand
Mines	12,507	42	3.35
Metallurgical works	3,817	2	.52
Quarries	1,820	3	1.65
Clay, sand, and gravel pits	850	8	9.41
Total	18,994	55	2.89

TABLE OF FATAL ACCIDENTS IN

No.	Date 1929	Name of Mine	Name of Owner	Name of Deceased	Age
1	Aug. 9	Bidgood	Bidgood Consolidated Mines, Ltd.	Daniel Waschuk	37
				Ignace Kuszneruk	26
2	Sept. 18	Caledonia	Canada Gypsum & Alabastine, Ltd.	Jos. Brunzako	32
3	Nov. 28	Westree	Canadian Champion Reef Mining Co., Ltd	D. Culhane	28
				T. Laffin	25
4	Dec. 19	Castle	Castle Trethewey Mines, Ltd.	Geo. Haapa	27
5	Nov. 22	Falconbridge	Falconbridge Nickel Mines, Ltd.	Fred Hoop	32
6	July 15	Hollinger	Hollinger Consolidated Gold Mines, Ltd	Rhys Jones	27
7	Nov. 14	"	" " "	E. Johnstone	21
8	Dec. 18	"	" " "	A. Gauthier	22
9	Jan. 27	Howey	Howey Gold Mines, Ltd.	Teemu Maki	31
10	Dec. 14	"	" " " "	M. Jazakas	28
11	Jan. 5	Frood	International Nickel Co. of Canada, Ltd	John Kujanpaa	43
12	Feb. 9	"	" " "	Rudolph Fluvian	43
13	Feb. 13	Creighton	" " "	Louis Sever	35
14	April 16	"	" " "	S. Wiita	36
15	Aug. 7	Frood	" " "	N. Pecarich	34
16	Sept. 5	Creighton	" " "	E. Frantini	24
17	Oct. 16	Frood	" " "	M. Antila	24
18	Oct. 24	"	" " "	K. Hytanen	28
19	Dec. 5	Creighton	" " "	Mike Lubera	29
20	Dec. 5	"	" " "	Frank Lovsin	27
21	Dec. 15	Levack	" " "	Sam Spak	33
				J. Kymalainen	32
				V. Kanerva	34
				Harry Motto	32
22	Dec. 28	Creighton	" " "	A. Sitar	28
23	Feb. 16	Keeley	Keeley Silver Mines, Ltd.	Oscar Provencher	30
24	Feb. 23	Lake Shore	Lake Shore Mines, Ltd.	D. McDonald	33
25	Dec. 29	"	" " " "	James Burton	28
26	July 27	McIntyre	McIntyre Porcupine Mines, Ltd.	Nick Cicci	31
27	April 4	Levack	Mond Nickel Co., Ltd.	Wasyl Procyk	29
				E. Vrtoveic	27
				E. Saari	27
28	June 17	Nipissing	Nipissing Mining Co., Ltd	Henry Brodeur	37
29	July 30	O'Brien	M. J. O'Brien, Ltd.	Oseo Matte	46
30	Aug. 29	Oriole	Oriole Mines, Ltd.	L. H. Spiers	22
31	May 31	Teck-Hughes	Teck-Hughes Gold Mines, Ltd.	J. Ronick	38
32	Jan. 3	Errington	Treadwell Yukon Co., Ltd.	Nick Liutek	32
33	June 6	Vipond	Vipond Consolidated Mines, Ltd.	Emilio Mion	28
34	Sept. 8	Wright-Hargreaves	Wright-Hargreaves Mines, Ltd.	K. Taavitsanen	36
35	Sept. 21	"	" " "	Henry Melong	46

OR ABOUT ONTARIO MINES, 1929

Occupation	Nationality	Married or Single	Above Ground	Below Ground	Cause
Miner	Pole	M		1	Delayed too long blasting.
Miner	Ukrainian	M		1	
Drill helper	Jugo-Slav	M		1	Fall of roof.
Miner	British	S		1	Premature blast.
Miner	British	M		1	
Miner	Finn	M		1	Fall of ground.
Cage tender	German	M		1	Sudden drop of cage.
Mucker	British	S		1	Suffocated in muck.
Driller	British	S		1	Struck by fragment from blast.
Driller	French-Canadian	S		1	Fall of ground while scaling.
Driller	Finn	M		1	Hose blew off header.
Miner	Lithuanian	S		1	Caught between cage and timbers.
Timberman	Finn	M		1	Fell down shaft.
Pumpman	Italian	M		1	Fell down shaft.
Scaler	Jugo-Slav	M		1	Fall of ground while scaling.
Timberman	Finn	M		1	Gangrene following dislocation of knee.
Drill helper	Pole	M		1	Drilled into missed hole.
Driller	Italian	S		1	Fell down ore pass.
Driller	Finn	S		1	Returned to face too soon when blasting.
Driller	Finn	S		1	Fell down raise.
Trammer	Pole	M		1	Struck head while drawing chute.
Chute blaster	Jugo-Slav	M		1	Fell down ore pass.
Skip tender	Russian	S		1	
Shaftman	Finn	S		1	Falling skip collided with bucket in which men were riding.
Shaftman	Finn	M		1	
Shaftman	British	M		1	
Drill helper	Jugo-Slav	M		1	Head caught by slack cable on small hoist.
Drill helper	French-Canadian	M		1	Drilled into missed hole.
Pipefitter	British	S		1	Fell down shaft.
Driller	British	S		1	Struck by falling steel box in stope.
Shift boss	Italian	S		1	Suffocated in muck.
Drill helper	Ukrainian	M		1	
Driller	Jugo-Slav	S		1	Suffocated in muck.
Driller	Finn	S		1	
Driller	British	M		1	Premature blast.
Hoistman	British	M		1	Fall of ground.
Labourer	British	S	1	1	Returned too soon to scene of blast
Shaftman	Jugo-Slav	M		1	Crushed between skip and shaft timber.
Driller	Ukrainian	S		1	Delayed too long blasting.
Mucker	Italian	M		1	Premature explosion.
Miner	Finn	M		1	Fall of ground while scaling.
Crusherman	British	M	1		Fell into crusher flywheel.

TABLE OF FATAL ACCIDENTS AT

No.	Date 1929	Place	Name of Owner	Name of Deceased	Age
36	April 15	Refinery.....	International Nickel Co. of Canada, Ltd.....	Mike Gudac.....	29
37	July 6	Smelter Yard.....	Mond Nickel Co., Ltd.....	Percy Redsell....	33

TABLE OF FATAL ACCIDENTS AT

No.	Date 1929	Name of Owner	Name of Deceased	Age
38	Jan. 10	Beachville White Lime Co., Ltd.....	Antonio Nadalin..	38
39	May 29	Grenville Crushed Rock Co., Ltd.....	Ronald McDonald	22
40	June 3	Walker Bros.....	Norris E. Walker.	22

TABLE OF FATAL ACCIDENTS AT

No.	Date 1929	Name of Owner	Name of Deceased	Age
41	May 4	Consolidated Sand and Gravel Co., Ltd.....	Wallace Neustead	57
42	June 26	Ellwood, H.....	Ernest Scidmore..	42
43	Sept. 17	Griswold, M. M.....	Robt. Kirkpatrick	43
44	July 9	Howell, Firman.....	John Canzoni....	18
45	May 17	Innerkip Lime and Stone Co., Ltd.....	A. W. Martin....	32
46	Dec. 12	Lake Shore Mines, Ltd.....	James Willis.....	51
47	Jan. 25	Northern Development Branch, Department of Lands and Forests.	John Wear.....	27
48	Oct. 31	Warren Bituminous Paving Co.....	Clarence Appleton	43

METALLURGICAL WORKS, 1929

Occupation	Nationality	Married or Single	Cause
Labourer....	Jugo-Slav.....	M	Fell from platform.
Loco. fireman	British.....	M	Caught between locomotive and car.

QUARRIES, 1929

Occupation	Nationality	Married or Single	Cause
Hoistman....	Italian.....	M	Struck by falling derrick mast.
Brakeman...	British.....	S	Struck by steam shovel dipper.
Asst. Supt...	British.....	S	Fell into flywheel.

CLAY, SAND AND GRAVEL PITS, 1929

Occupation	Nationality	Married or Single	Cause
Labourer....	British.....	M	Struck by locomotive.
Truck driver.	British.....	S	Fall of gravel from bank.
Labourer....	British.....	M	Crushed between truck and bank.
Farmer.....	Unknown.....	S	Fall of gravel from bank.
Mechanic....	British.....	S	Clothing caught by revolving shaft.
Labourer....	British.....	S	Thawing dynamite before a stove.
Labourer....	British.....	M	Fall of frozen gravel.
Labourer....	British.....	M	Collapse of gravel bin.

The occupation and nationality of the men killed at mines, metallurgical works, quarries, clay, sand and gravel pits, are set out in the following table:—

Occupation	English-speaking	Pole	Ukrainian	Jugo-Slav	Finn	German	Lithuanian	Italian	Russian	Unknown	Total
Miner	6	1	2	1	6	....	1	1	....	....	18
Drill Helper	1	1	1	2	....	....	....	....	....	....	5
Cage Tender	....	....	....	....	....	1	....	....	....	....	1
Mucker	1	....	....	....	....	....	....	1	....	....	2
Timberman	....	....	....	....	2	....	....	....	....	....	2
Pumpman	....	....	....	....	....	....	....	1	....	....	1
Scaler	....	....	....	1	....	....	....	....	....	....	1
Trammer	....	1	....	....	....	....	....	....	....	....	1
Chute-blaster	....	....	....	1	....	....	....	....	....	....	1
Skip Tender	....	....	....	....	....	....	....	....	1	....	1
Shaftman	1	....	....	1	2	....	....	....	....	....	4
Pipe Fitter	1	....	....	....	....	....	....	....	....	....	1
Shift boss	....	....	....	....	....	....	....	1	....	....	1
Hoistman	1	....	....	....	....	....	....	1	....	....	2
Labourer	6	....	....	1	....	....	....	....	....	....	7
Crusherman	1	....	....	....	....	....	....	....	....	....	1
Loco. Fireman	1	....	....	....	....	....	....	....	....	....	1
Brakeman	1	....	....	....	....	....	....	....	....	....	1
Mechanic	1	....	....	....	....	....	....	....	....	....	1
Asst. Superintendent	1	....	....	....	....	....	....	....	....	....	1
Truck driver	1	....	....	....	....	....	....	....	....	....	1
Farmer	....	....	....	....	....	....	....	....	....	1	1
Total	23	3	3	7	10	1	1	5	1	1	55

The ages of the men killed were as follows:—

17–20	21–25	26–30	31–35	36–40	41–45	46–50	Over 50	Total
1	8	17	14	6	5	2	2	55

Non-Fatal Accidents

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

Cause	Surface	Underground	Total
Rock or ore at face	.....	304	304
Rock or ore at chute	.....	129	129
Fall of Persons	58	154	212
Falling objects	47	135	182
Fall of rock or ore from face, wall or back	.....	106	106
Tramming	2	134	136
Crushed between two objects	30	104	134
Flying objects, sledging, etc	17	99	116
Nails or splinters	32	80	112
Drilling machines	.....	91	91
Hand tools	36	50	86
Strain while lifting	19	56	75
Machinery	37	10	47
Running into or striking against objects	7	37	44
Cage, skip or bucket	.....	23	23
Explosives	3	17	20
Falling down shaft, winze, raise or stope	.....	16	16
Burns	13	1	14
Electricity	10	.....	10
Gas	1	3	4
Explosion of carbide	4	3	7
Poisoning from cyanide, mercury, etc	2	.....	2
Unclassified	6	1	7
Total	324	1,553	1,877

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

Falling objects	51	Machinery	8
Burned by slag, matte or scrap	26	Strain while lifting	5
Fall of persons	20	Nails or splinters	5
Transportation	13	Cranes, ladles, hooks	4
Crushed between two objects	12	Running into or striking against objects	4
Flying objects, sledging, etc	11	Electric	3
Burns	9	Gas	1
Hand tools	8	Total	180

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

Handling material	56	Machinery	10
Falling objects	30	Fall of rock	9
Fall of persons	28	Explosives	7
Flying objects, sledging, etc	20	Nails or splinters	6
Transportation	19	Burns	4
Strain while lifting	15	Hoists, derricks, elevators	2
Crushed between two objects	14	Unclassified	5
Hand tools	12	Total	237

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

Falling objects	19	Flying objects	5
Fall of persons	17	Running into or striking against objects	5
Transportation	11	Hand tools	4
Machinery	9	Nails or splinters	3
Crushed between two objects	7	Burns	3
Fall of material	5	Electric	1
Strain while lifting	5	Unclassified	1
		Total	95

Infection

Records show that infection followed in 164 cases out of 2,389 non-fatal accidents in 1929.

Location	Number of accidents	Accidents followed by infection	Per cent. infection
Mines underground	1,553	96	6.2
Mines surface	324	35	10.8
Metallurgical works	180	7	3.9
Quarries	237	19	8.0
Clay, sand and gravel pits	95	7	7.4
Total	2,389	164	6.9

Accidents from Explosives

Cause	Non-fatal		Fatal		Total	
	Number Accidents	Men injured	Number accidents	Men killed	Number accidents	Men killed or injured
Struck by rock from blast	9	9	1	1	10	10
Premature explosion	5	7	3	4	8	11
Delayed too long lighting fuse	2	2	2	3	4	5
Drilled into explosive	5	7	2	2	7	9
Returned to delayed blast	.....	.....	2	2	2	2
Handling explosives	3	4	1	1	4	5
Concussion from blast	1	1	.....	.....	1	1
Total	25	30	11	13	36	43

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

1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	Total
.....	2	.....	.....	1	3	.....	2	1	.....	9

Voltage of the circuits on which the accidents occurred:—

Volts	Number of accidents
220	1
550	7
2,200	1
Total	9

Classifying the accidents according to the industry shows the following:—

Mines, surface	4
Metallurgical works	3
Quarries	2
Total	9

The causes of fatal accidents due to electricity during the past ten years were as follows:—

Failure to open circuits before working on apparatus	4
Defective temporary installation	1
Defective wiring	2
Water leaking on apparatus and ground wire disconnected	1
Touched live line on pole and fell to ground	1
Total	9

The following table shows the non-fatal electric burns during the past ten years:—

1920	1921	1922	1923	1924	1925	1926	1927	1928	1929
14	6	6	9	9	6	5	10	4	14

Causes of non-fatal electric burns during 1929:—

Arc when closing disconnecting switches	3
Opening disconnecting switches under load	2
Working on live circuit	2
Coming in contact with high-voltage circuit	2
Coming in contact with low-voltage circuit	2
Oil switch exploded	1
Compensator exploded	1
Closing disconnecting switch on short circuit	1
Total	14

Fire Caused by Electric Apparatus in 1929

A fire originated in the coils of a 150 h.p., 550-volt motor at the Levack mine of the International Nickel Company of Canada, Limited, at about 2.45 a.m., December 15.

The motor was driving a Symons crusher by a belt and was installed in a separate compartment, nine feet square, with the roof three feet above the top of the motor. The building was constructed of corrugated iron and the roof and walls were lined inside with wood. The floor was made entirely of concrete, with the wiring in conduit buried in the concrete.

The fire was confined to the insulation of the motor when first discovered and the motor was stopped by remote control.

The smoke was too intense to permit entrance to the room and there were no fire extinguishers close at hand.

The flames from the motor ignited the roof and walls and spread rapidly to the crusher plant.

Four lives were lost in the shaft as a result of the fire, when four miners attempted to ride up in the bucket.

The crusher-plant, rock-house and headframe were destroyed.

Prosecutions

The appeal by the Attorney-General for Ontario from the judgment of the Appellate Division of the Supreme Court of Ontario in the case of Rex vs. Baker was heard by the Supreme Court of Canada, February 5, 1929, Justices Duff, Mignault, Newcombe, Lamont and Smith sitting on the appeal.

The decision of the Appeal Court, setting aside the findings of Police Magistrate McKessock of Sudbury, was affirmed.

To give a brief summary of the previous proceedings in the case:

Fred J. Baker, hoistman at No. 1 Shaft, Frood Mine, was charged before Magistrate McKessock with criminal negligence under Section 284 of the Criminal Code. The prosecution arose following an accident in the shaft when Baker overwound a skip on September 23, 1928.

The Police Magistrate found him guilty and sentenced him to a fine of $200 and costs or, in default, three months' imprisonment.

An appeal to the Supreme Court of Ontario resulted in the quashing of the magistrate's finding. The Supreme Court of Canada upheld the Ontario Court's judgment as outlined above.

Before Magistrate Atkinson, at South Porcupine, Ontario, on February 21, E. Sirrila, a drill runner at the Hollinger mine, was fined $10.00 and costs for a contravention of Regulation 25, section 161 of the Mining Act, in that he "drilled within ten feet of a cut-off hole."

J. Kisil, a Pole, who had been in the employ of the International Nickel Company of Canada, Limited, at Creighton Mine, was tried before Magistrate Thos. Stoddard, at Creighton, on October 31, on a charge that: "At the Village of Creighton, in the District of Sudbury, on or about the 28th day of October, 1929, being under the influence of liquor, did go down to the 23rd level of the Creighton mine of the International Nickel Company of Canada, Limited, contrary to subsection 219 of section 161 of the Mining Act of Ontario, being part of Chapter 5 of the Revised Statutes of Ontario, 1927."

Magistrate Stoddard found the accused guilty and fined him $75.00 and costs, or three months in jail. Costs amounted to $35.50. Kisil elected to take the jail term rather than pay the fine.

Victor Lalonde was tried before Magistrate McKessock, at Sudbury, on November 1, in connection with a fatal injury to Kalle Hytanen. The accident occurred at the Frood mine of the International Nickel Company of Canada, Limited, on October 24.

The charge laid was that: "Victor Lalonde, of the Town of Sudbury, in the District of Sudbury, on or about the 24th day of October, 1929, did hoist one Kalle Hytanen in a skip used for hoisting material in a raise on the 2,000-foot level in the Frood Mine of the International Nickel Company of Canada, contrary to subsection (a), of subsection 50, of section 161 of the Mining Act."

Lalonde's own evidence given at the inquest was quite conclusive and he pleaded guilty to the charge.

The straightforward way in which the accused gave his evidence at the inquest and the fact that he was of a type that the company officials considered worthy of re-employment, inclined the Magistrate to leniency. Lalonde was sentenced to pay a fine of $20.00 and costs or one month in jail. He paid the fine. Costs amounted to $22.80.

Government Mine Rescue Station at Timmins

Pending legislation authorizing the erection of three central mine rescue stations in the Porcupine, Kirkland Lake and Sudbury districts, an arrangement was effected by which a mine rescue station, in advance of such authority, was established in Timmins late in 1929 to afford a degree of protection until the whole scheme might become effective.

The arrangement provides that the station be financed through the Workmen's Compensation Board of Ontario out of assessments levied on the mines, while the equipment of the station, the selection of the personnel in charge of it and all matters pertaining to the operation and maintenance of the station are under the control of the Chief Inspector of Mines.

This, in the main, follows the lines laid down in the proposed legislation covering the entire three stations which are to be established in the Province.

The Timmins Station is housed in a tile building, 15 feet by 40 feet, erected as a lean-to to the municipal fire hall, and provides two rooms for storage of equipment and training purposes. The main room (15 feet by 28 feet) is used

Interior view of Timmins mine rescue station, showing part of the rescue equipment.

as a storage and lecture room and, in addition, contains the heating plant. While the second room (15 feet by 12 feet) is used as a "smoke room" in which training may be given in irrespirable atmosphere and is separated from the storage room by a gas-tight partition containing a long observation window through which the supervisor may observe at all times the action of the crew undergoing training in the smoke room.

In the main the rescue equipment carried at the station consists of:

12 Sets of McCaa, 2-hour type, self-contained oxygen breathing apparatus.
12 All Service gas masks.
24—M.S.A. Self Rescures.
2—M.S.A. carbon monoxice detectors.
1—Pyrotannic acid carbon monoxide detector and air sampling accessories.
2—Wolf Flame safety lamps,
12—Model "F" Edison electric cap lamps.

In case of an emergency there are sufficient supplies to operate the apparatus until additional supplies can be obtained by express.

It is proposed to commence training of mine crews in mine rescue, first aid and mine recovery operations as soon as a standard course of training can be decided on and drawn up.

At the time of writing arrangements have been effected through the courtesy of the United States Bureau of Mines for a team composed of the inspectors of the Department of Mines, the supervisor of the Timmins Station and a representative of the McIntyre Porcupine Mines to take the U.S. Bureau of Mines training course at the Pittsburgh Station of the Bureau.

On the completion of the course a schedule for training Ontario miners will be drawn up and the actual training of mine teams commenced.

Rescue team wearing McCaa two-hour breathing apparatus, Timmins mine rescue station.

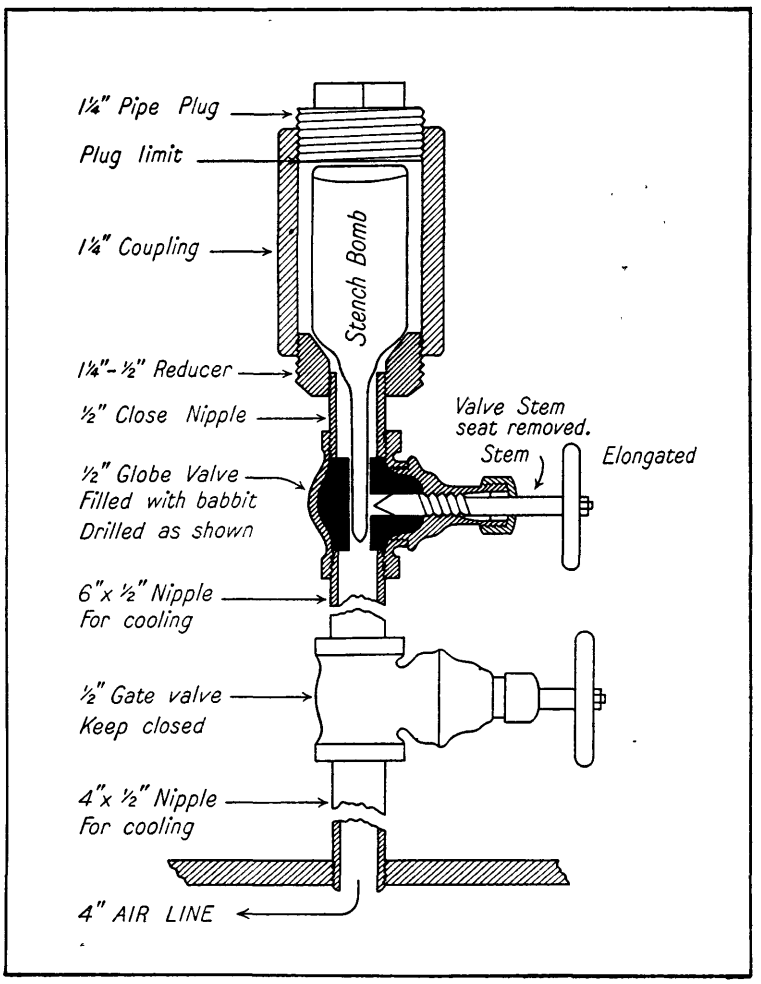
Stench Test at Vipond Consolidated Mines, Limited

The introduction of the stench, ethyl mercaptan, into the air lines, as a signal to underground workmen to vacate the mine, was tried under working conditions at the Vipond mine, Timmins, and the results obtained demonstrate the effectiveness of this warning signal.

The apparatus used for the introduction of the stench is illustrated by the accompanying sketch. It will be noted that the apparatus is made from standard pipe fittings. The modification of the valve for breaking the stench bomb can be accomplished at small cost and with few tools. Owing to the low boiling point of the ethyl mercaptan, it is essential that the pipe nipples used be of

sufficient length to dissipate the heat from the air lines. The length shown in the sketch proved adequate with the apparatus installed forty feet from the compressors and on the mine side of the receivers, which point is essential. There are four of these injectors installed on two air mains and housed in a small box midway between the hoist-house and the shaft-house.

About two weeks before the test was made, a notice was posted to the effect that a trial of this warning signal would be made and asking the men to become familiar with the smell. They were also asked to record the time of detection



Stench bomb container and control valves (half size).

of the stench and then proceed to the shaft. A small quantity of ethyl mercaptan was placed in the shaft-house, where, by turning a valve, it could be let into the atmosphere.

At the time of the test there were approximately sixty men underground engaged at their usual work. The mine has about nine miles of underground workings and ventilation is by natural air currents, except for the compressed air, which amounts to 1,800 cubic feet of free air per minute.

Four bombs were used, each containing 12 c.c. of ethyl mercaptan. They were broken at intervals of twenty seconds, one in each of the four injectors as illustrated. Four minutes after the first bomb was broken a flash for the cage was received from the 866-foot level. Forty-seven minutes after the introduction of the stench all the men were out of the mine. Two crews of scalers failed to get the warning, but these men were far removed from operating drills. One of these men was warned by other workmen and one failed to receive any kind of warning.

Two hours after the stench was introduced the next shift went to work, and the atmosphere underground was quite clear.

The experience demonstrated that the stench was effective and entirely harmless.

The quantity of ethyl mercaptan injected into the air lines was roughly twenty c.c. for every 1,000 cubic feet of free air compressed per minute. It would perhaps be wise to use more; something like 30 c.c. would be a better quantity. It is essential that the introduction of the stench be spread over at least one minute of time. This insures a good distribution of stench in the air passing through the line. The four inexpensive injectors as used in this test insure the placing of the required quantity in the line over a given period.

The following are some notes of interest on the experiment:—

Time of breaking first bomb.....1.47 p.m.
Time of breaking second bomb.....1.47.20 p.m.
Time of breaking third bomb.....1.47.40 p.m.
Time of breaking fourth bomb.....1.48 p.m.

Record of men coming to surface:—

Working place	Time surface reached	Remarks
866 Level..	1.53 p.m.	Men at pump station; no drill working.
200 " ..	1.56 "	Men drilling in 200-H stope; strong odor.
1000 " ..	2.01 "	Muckers at station; no drills.
733 " ..	2.03 "	Scalers in 709 stope; no drills.
500 " ..	2.07 "	Drift; got stench at 1.57 p.m.; stayed to blast.
866 " ..	2.05 "	Machine men in 802 raise.
600 " ..	2.09 "	Sub-level; machine men and scalers.
400 " ..	2.13 "	Men from 514 stope and 402-B drift.
400 " ..	2.14 "	426 stope; machine running; strong odor.
733 " ..	2.30 "	707-B stope; machine running but odor not strong.

Vipond side muckers warned Vipond side scalers, who reached the surface at 2.34 p.m. Scalers in 604 stope failed to get a warning of any kind. At the old Vipond shaft collar the warning came through a leak in the air line at 1.55 p.m. The natural air currents brought the warning to this upcast shaft at 2.03 p.m.

The Department of Mines is indebted to the Vipond mine, and especially manager Robert E. Dye, for making this test under working conditions. It has proved that an adequate warning can be given underground directly to 95 per cent. of the workmen. It also gives a fair estimate of the quantity of ethyl mercaptan necessary under metal mine conditions, as based on compressed air only.

FATAL ACCIDENTS

Mines

Bidgood Consolidated Mines, Limited

Dan Waschuk, aged 37 years, a Pole, married, his wife and one child residing in Poland, and Ignace Kuszneruk, aged 25 years, Ukrainian, his wife and one child residing in the Ukraine, were killed on the 850-foot level of the Bidgood mine on August 9, at 3.15 p.m.

They lit a sixteen-hole face, blasting the cut and the square at the same time and were using six-foot fuse (40 seconds to the foot), Black Clover Brand. The face of the crosscut, where the men were blasting, was 50 feet from the drift. Waschuk was found dead at the end of the pipe line, 10 feet from the drift. He may have gone back to turn on the air or misjudged the time. His partner was at the corner of the crosscut, but the explosion of the cut caught both men. Kuszneruk walked to the main crosscut, a distance of 450 feet, where he was found unconscious, and died in the hospital at 8 p.m. without making any statement.

John McPhee, manager, stated that both men were careful workmen. Waschuck had been in the employ of the company five months and Kuszneruk three months.

An inquest was held by Coroner Dr. Edis, at Kirkland Lake, on August 29. The jury returned a verdict of accidental death.

Canada Gypsum and Alabastine, Limited

Joseph Brunzako, Jugo-Slav, aged 32 years, married, with his wife residing in his native land, was fatally injured by a fall of rock from the roof of the Caledonia gypsum mine of the Canada Gypsum and Alabastine, Limited, about 9.30 a.m. on September 18, and died about 1.30 a.m., the following morning in St. Joseph's Hospital, Hamilton.

Brunzako was employed as a drill helper at the time of the accident and had worked at the mine for the past three and one-half years.

A break-through or crosscut through the twelve-foot pillar between adjoining rooms was being driven by Brunzako and his partner, Bert Squires, at the time of the accident. The right hand side of the crosscut had been broken through and one round blasted on the left hand side on the night preceding the accident.

Brunzako and Squires were scaling preparatory to setting up their drill when the accident happened.

The height of the face on which the men were working was approximately seven feet, which constitutes the gypsum bed of six feet, with an overlying shale parting of about one foot thickness. The blasting of the previous night had broken out the gypsum and left an overhanging roof of this shale about three feet in width by seven feet in length.

The men apparently tried to bar down this shale ledge without success and were working on a shattered toe of gypsum when the shale slab fell, presumably freed by the removal of some "key piece" of the gypsum toe which was holding the shale in place.

Brunzako was struck about the shoulder and chest by the fall and badly crushed, sustaining several broken ribs and a fractured left clavicle, one of the broken ribs piercing the lung. Death was due to internal haemorrhage.

An inquest was held at Hamilton, on September 27, before Coroner O. J. Newell, M.D., the jury returning the following verdict:—

"We, the jury impanelled to investigate the circumstances of where, when and how, Joseph Brunzako came to his death, are of the opinion that he came to his death accidentally on the 18th day of September, 1929, by a piece of unobserved rock falling from the wall of the mine of the Canada Gypsum Company, at Caledonia."

Canadian Champion Reef Mining Co., Limited

D. Culhane, 28, British, single, and T. Laffin, 25, British, with a wife and one child residing in Sudbury, were instantly killed by a premature blast on the 500-foot level of the Canadian Champion Reef Mining Company's property in MacMurchy township, about 26 miles northeast of the town of Westree. The accident occurred at about 3.55 p.m. on November 28.

Work was commenced on the property on October 28, 1929, after a shut down of some nine months. Operations were being carried on underground on a two-shift basis with one machine only. A round was drilled and blasted on morning shift and mucked in the afternoon.

A very limited amount of work had been done on the 500-foot level. A crosscut running in a northerly direction from the shaft had been advanced some 80 feet. About 30 feet from the shaft an east drift had been turned off and at the time of the accident had been driven 32 feet.

On November 28 Culhane and Laffin finished drilling a round in the drift shortly after lunch and proceeded immediately to blast the "cut." Due to the limited space on the level it was necessary for the miners to come to surface during blasting. Evidence showed that the men waited on surface between 30 and 45 minutes before returning to blast the "square up."

At approximately 3.55 p.m. they descended with fuse and powder to finish blasting the round. Half an hour later the hoistman received the blasting signal and answered it. Before any further signal was rung the report of a blast was heard by everyone in the hoist-house. There was evidently a definite lapse of time between this report and the time the remainder of the round started to go.

Evidence as to time was found to be rather contradictory. Some witnesses thought that from the time the blasting signal sounded till the second report was heard was as long as ten minutes. Mr. Hylands, the superintendent, gave undoubtedly the most logical evidence in this connection. The mine captain, who was in the hoist-house at the time the first report was heard, proceeded at once to the cookery to notify Mr. Hylands of what he knew to be inevitable. The two men returned to the hoist-house, fixed their lamps, and were on their way to the shaft when they heard the second report. The cookery is about 300 feet distant from the hoist-house and from this Mr. Hylands estimates a length of time not over two minutes between the first and second reports. Assuming that the miners, when they rang the blasting signal, were ready to spit their fuse, the total time between the blasting signal and the second report should have been about four minutes, judging by the length of fuse used. From this it can be deduced that about two minutes of time had elapsed, or about half the fuse had been burned when the premature blast occurred.

The face, when mucked out, revealed the fact that the three lifter holes had not been lit. Because of this fact, coupled with the lapse of time between the first and second reports, there is little doubt that the blast was premature. The cause, however, can only be surmised. One possibility which appeals to the writer is that since about half the fuse was burned it would be possible that

a side-spit from the fuse ignited or detonated the powder. The condition of the powder substantiates this theory. The date of manufacture was October, 1928. An examination showed all cartridges to be badly discoloured and about 40 per cent. of them showing nitroglycerine on the wrappers.

The possibility of a fuse from one hole back-spitting into the collar of another was considered, but evidence was fairly conclusive that all holes were tamped.

An inquest was held in Sudbury on November 30 and adjourned until December 3. Coroner Dr. Henry presided.

Castle-Trethewey Mines, Limited

George Haapa, Finn, aged 27 years, married, his wife and two children residing in Finland, was fatally injured at the Castle-Trethewey mine on December 19, at 2.30 p.m.

One chute was hung up about 12 feet in 625-10 stope. The levels are 75 feet apart and the muck was down about 25 feet from the level above. George Haapa and Mati Lepia were sent into the stope to try to get the muck started by shovelling into the adjoining chute which had been pulled well down. A platform was built over the chute that was hung up and a rope used when it was necessary for the men to stand on the muck.

At the time of the accident Haapa was mucking into the adjoining chute. Lepia stated in his evidence that the loose weighed about 200 pounds and dropped about four feet. The loose fell from the hangingwall side of the stope. The stope is at an incline of about 70 degrees and is four and a half feet wide where the accident occurred. The loose fell on Haapa's ankle and crushed it badly. Haapa died at Elk Lake on the way to the hospital.

An inquest was held at the Castle mine by Dr. McCullough. The jury returned a verdict of accidental death.

Falconbridge Nickel Mines, Limited

Fred Hoop, aged 32, German, with a wife and one child residing on the north half of lot 12, concession VI, in the township of Neelon, was fatally injured at the Falconbridge mine about 6.45 a.m., November 22. Hoop died in St. Joseph's Hospital, Sudbury, about 2.30 p.m. of the same day. Death was due to injuries to the brain caused by a fractured skull.

Hoop was employed as a cagetender at the time of the accident and had been in the employ of the company in various capacities since the commencement of operations in September, 1928. He was considered a good miner and a careful worker.

The deceased had worked on the 3 p.m. to 11 p.m. shift on November 21 and, as he was doing a short change and going on at 7 a.m. the morning of November 22, had rested in the dry rather than return home. At 6.45 he entered the cage alone and rang the signal to lower to the 225-foot level. He was presumably going underground to attend to the pumps before commencing to lower the morning shift. Gordon Larrott, the hoistman, got the signal and acted accordingly, paying out cable to the east compartment on which he had been signalled to lower.

Larrott's first intimation of trouble was a violent jerk on the cable and a vibration of the ammeter. He stopped the hoist immediately. The indicator had moved about one and a half inches, or a distance corresponding to 30 feet. Larrott, leaving the hoist in charge of his relief, proceeded at once to the shaft-house. He received no answer when he called down the shaft to the cagetender, so proceeded down the ladderway accompanied by another miner.

They cut a hole through the tight lining and entered the cage through the top. Hoop's body was lying cornerwise in the cage, his feet out the door and jammed between the flooring and the shaft timber.

It is evident that the cage, which had not been moved since about 5 a.m., had frozen to the guides at the surface. The ice was sufficient to take the strain momentarily but then gave way, allowing the cage to fall. The fact that the safety dogs failed is of course a matter of great consequence. The Machinery Record Book shows the dogs on each compartment to have been tested three times on November 15, 1929. No drop greater than three inches is recorded. When examined after the accident, all parts were apparently in good order. Although the cable must have been subjected to quite a strain, an examination showed it to be in good condition with no visible broken wires. It evidently had not been kinked. This leads to a possible explanation of the failure of the safety dogs to act. Since the weight of the cable between the hoist-house and the sheave wheels is greater than that from the sheaves to the cage the latter portion stayed more or less taut. The thirty feet of slack was entirely taken up in the sag between the two buildings. Apparently the weight of the sagging cable was sufficient to hold the safety dogs open and keep them from engaging with the guides; that is, the tension on the coil springs which actuate the dogs was sufficient for perfect operation with a loose cage but was insufficient to cause them to set against the added weight of the cable.

Although the doors of the cage were open when Larrott reached the deceased, it cannot be assumed that the cagetender had not closed them. It is quite possible that after ringing the signal and apparently getting no answer he again opened the doors to ring a second time and that this action caused the cage to break free.

Arrangements have been made to reconstruct the situation and run a series of tests in the immediate future.

An inquest was held at the mine on November 25, before Coroner Thos. Stoddart.

Hollinger Consolidated Gold Mines, Limited

Rhys Jones, aged 27 years, Welsh, single, was killed at 12.30 p.m., July 15, in 44 east No. 9 stope on the 200-foot level of the Hollinger mine.

Jones and Potvin were mucking with a wheelbarrow in No. 9 stope, in a sublevel, and two machine men were drilling slash holes about 40 feet from the collar of the raise. The raise is about six feet by five feet and was driven from the 200-foot level to the sublevel as an ore pass, a distance of 65 feet. There is about three feet of solid rock on the footwall side of the raise.

The boxhole was full of muck so that no more could be dumped with a wheelbarrow. Jones went down to the 200-foot level and asked the chute loader how many cars had been pulled. On being told that eighteen had been pulled, he returned to the stope. Potvin was talking to the machine men about 30 feet away when he heard the rush of muck and turned in time to see Jones go down with the muck. Evidently Jones returned to the raise and tried to start it with a scaling bar, and was standing too close to the edge of the hole.

The muck dropped about 18 feet and about four feet was taken out before Jones' body was reached at 4.30 p.m. The doctor stated that Jones had been dead about three hours when taken out.

An inquest was held at Timmins on July 18. The jury returned the following verdict:—

"That Rhys Jones came to his death at the Hollinger Mine on July 15th, 1929, being smothered by pressure of muck in a boxhole. No blame attached to anyone."

On November 14, at 10 p.m., E. Johnstone, aged 21, single, of English descent, was fatally injured while standing with his partner, Joe Popovich, at the top of a raise, 59 feet from two sand blasts which they had just lit on the same level. Johnstone died at 2 a.m., on November 15, without regaining consciousness. Popovich was uninjured.

Evidence given at the inquest brought out the following information:—

Johnstone placed two sand blasts on large rocks on a sloping ore pile and, after lighting them, went with his partner to the top of a manway, 59 feet from the blasts, leading to the 1,700-foot level. They remained on top of the manway, thinking themselves to be safe on account of posts and an ore car between them and the blasts. The lights were blown out when the shots went off and when Popovich relit his he saw that his partner had been hit. Popovich claims that he noticed no flying material and on inspection of the timber close by only one small mark could be found that might have been caused by flying material. He also claims that he heard no sound from his partner and did not know of his injury until he relit his lamp. Popovich moved Johnstone to a more comfortable place and went for help. The deceased was taken directly to the hospital in Timmins, where he died, death being due to a badly fractured skull.

Popovich stated that Johnstone said they would stand on the top of the manway and wait for the reports, as he wanted to go back and reblast if the rocks were not well broken. This is no doubt the case, as the lunch pails of both men were together on the other side of the stope. This would indicate that they were not caught before they could get to safety and Popovich further states that they waited three or four minutes for the first blast to go and that the second was a minute later.

Evidence regarding the length of fuse conflicted. W. Mortimer, safety inspector, found two lengths near the rock pile. They were of equal lengths, six feet two inches. This would indicate that twenty-two inch lengths of fuse had been used, as the regular length issued for this place is eight feet. Popovich says the fuse used was about four feet long. The fuse was Black Clover Brand, having a normal burning speed of 40 seconds to the foot. The two lengths found were tested and proved to be normal. Each sand blast contained two sticks of 55 per cent. Polar Ammonia Dynamite covered with loose rock.

The only reason that can be offered for these men remaining on the top of the manway was to guard against some one approaching the blast from the level above through a raise some 80 feet beyond where they stood on the first manway. Apparently previous to this time this raise had been guarded by the deceased climbing up it while his partner went down the manway over which they were standing. The position of the wound in the skull also indicates that the deceased had his back to the blast and was watching along the stope to the other raise.

Johnstone had been employed at the mine since March 8, 1927. For the past year he had been employed in this stope as labourer and helper on a machine. He had seen explosives used and had helped handle them during this time. On November 1, 1929, he was raised to the position of runner and made responsible for the blasting on his shift.

On the night of the accident Johnstone and Popovich were mucking and were, at the time of the accident, sand blasting the large rocks in the ore pile before going off shift.

An inquest was held before Coroner H. Montgomery, in Timmins, on November 16. A verdict of accidental death attaching no blame to anyone was returned by the jury.

A. Gauthier, aged 22, French Canadian, single, with next of kin living at Coniston, was instantly killed in stope 1, east of 3.2 crosscut, on the 200-foot level of the Hollinger mine at about 8.30 a.m., December 18.

Gauthier was employed as a machine runner in a hammer drill stope, on contract, and at the time of the accident was scaling with another runner at the scene of the last blast in the stope.

J. Antolich, witness, could give no details of the accident, except that Gauthier was using a scaling bar, while he was using a pick. Gauthier was working from the hangingwall, while Antolich was at the footwall, not more than 10 feet separating the two. Antolich heard the rock fall and saw that his partner had been buried from the head to the waist. The head was badly crushed. There was perhaps a ton of rock in the fall.

Gauthier had worked as a runner in this stope since it started and it was within a week of completion. He was a good workman and considered careful. The ground in this stope could not be considered good but there have been no previous accidents in it due to falling ground.

An inquest was held before Coroner Montgomery, in Timmins, on December 20, when a verdict of accidental death, attaching no blame to anyone, was returned.

Howey Gold Mines, Limited

Teemu Maki, driller, Finn, aged 31 years, married, with a wife and two children residing at Sudbury, was fatally injured at the 500-foot level station of the Howey mine about 1 p.m., January 27, and died eight hours later from the effect of his injuries.

At the time of the accident Maki and other workmen were moving the air header in the station preparatory to blasting in the shaft below the level. The air was on the header at the time and while it was being moved one of the hose blew off the header and struck Maki in the forehead, inflicting three deep lacerations and fracturing the skull.

Maki was immediately removed to surface, where he was attended by Dr. T. J. Goodison, resident mine physician, but died about 9 p.m. without having regained consciousness.

An inquest was held at the mine before Coroner H. E. Holland, on January 28, when the jury returned the following verdict:—

"That Teemu Maki came to his death by an unavoidable accident and that no blame attaches to any person."

Myrkalar Jazakas, Lithuanian, single, aged 28 years, was instantly killed about 4.30 p.m., on December 14, in the main shaft of the Howey mine, when he fell from the cage and was crushed between the shaft timbers and the ascending cage.

Jazakas had been employed as a miner at the Howey mine since June 6, 1929.

On the day of the accident Jazakas and his brother were working in a heading on the 875-foot level and, after blasting some holes shortly before noon, had gone back to the working after lunch and worked till after 4 p.m. mucking out the heading. Some gas had been in evidence through the afternoon, but none of the workmen seemed to feel any effects from their exposure.

About 4.30 p.m. the cage tender, I. Kustic, stopped at the 625-foot level and picked up a workman, E. Huttala, there and continued to the 875-foot level, where he picked up the Jazakas brothers, then rang the cage to surface. A.

Jazakas and Huttala were standing at the back of the cage, while the cage-tender and the deceased were standing at the front. The bar had been put down, but the doors had not been closed.

Shortly after leaving the level, M. Jazakas was seen to slump down and slip off the cage between the deck and the bar and was crushed between the timbers and the deck of the cage, the body falling down the shaft.

The sudden collapse of Jazakas would appear to be due to his having been exposed to powder gas during the afternoon, as it is frequently noted in such cases that the victim will carry on with no apparent symptoms until he reaches fresher air, when he will suddenly collapse.

It should be noted, however, that had the cage doors been properly closed the fatality would have been averted.

An inquest was held at Red Lake before Coroner H. E. Holland, on December 18, the jury returning the following verdict:—

"That Myrkalar Jazakas was killed on Saturday, December 14th, 1929, at about 4.30 p.m. in the Howey Gold Mine shaft by falling out of the cage and being caught between the cage floor and the shaft timbers."

International Nickel Company of Canada, Limited

John Kujanpaa, Finn, aged 43 years, a widower, was fatally injured by a fall in No. 3 shaft, Frood mine, about 10.30 a.m., January 5, and died in the Copper Cliff Hospital about 2.30 p.m. the same day.

Kujanpaa was employed as a shaft timberman and at the time of the accident was removing shaft lagging at the rock pocket below the 2,000-foot level.

Five men constituted the crew on this work on the morning of the accident, but, at the particular time Kujanpaa fell, some of the members of the gang were working under the staging from which he fell and some had gone up three sets above to remove timbers from the cage. There were thus no eye witnesses to the accident and no evidence could be obtained as to what Kujanpaa had done to cause him to fall.

Evidence as to whether or not the customary guard rails had been placed along the staging on which the deceased was working was somewhat at variance. Matti Lahti, another timberman, who had been working with Kujanpaa just previous to the accident and who had gone up to help unload the cage, seemed to have a much clearer conception of the conditions at the time of the accident than the rest of the witnesses. Lahti swore that two guard rails had been in place on each compartment.

The first intimation of the accident was had when E. Gladin, working on a set beneath Kujanpaa's stage, heard a shout and climbed up to see what was wrong. Finding Kujanpaa gone, Gladin started down the shaft and located the injured man nine sets (63 feet) below the point from which he fell and on the opposite side of the shaft.

Kujanpaa was wedged behind a shaft post, but was conscious. He complained of pains in his legs, asked for water, and said, "I guess I fell down."

Removed to the surface and examined by Dr. E. G. Bell, Kujanpaa was found to have sustained a ragged wound on the right front of the head and broken both bones of the right leg, the bones of the right hand and several ribs.

After dressing the injuries Dr. Bell had the man removed in the ambulance to the Copper Cliff Hospital, where he died in the afternoon. Death was ascribed to a punctured lung and shock.

An inquest was held at the mine before Coroner J. S. McKessock, on January 9, and a verdict of accidental death was returned.

Rudolph Fluvian, Italian, aged 43 years, married, with wife and six children residing in Sudbury, was instantly killed between 9 and 10 a.m., February 9, when he fell from some undetermined point between the 1,600- and 2,000-foot levels to the bottom of No. 3 shaft, Frood mine.

Fluvian was employed as pumpman at the time of the accident and had worked at the mine and in and about No. 3 shaft for over two years and was perfectly familiar with the operations in the shaft. He was considered to be an unusually careful man.

On the morning of the accident Fluvian had been called from the 2,800-foot level by B. J. Fyfe, the mine captain, to go over the water valves and connections on the water rings in the shaft between the 1,200- and 2,000-foot levels, as the drillers on the 1,600- and 2,000-foot levels had been complaining of a shortage of water, which was drawn from a series of water rings in the shaft.

It is not necessary for the person inspecting the regulating valves on these rings to go out of the manway and pipe compartment, as all such accessories have been installed in that compartment.

Fluvian was seen on the 1,600-foot station by Fyfe after having completed the inspection from the 1,200-foot level to the 1,600-foot level, between 9 and 9.30 a.m. He reported everything in good order between those two levels and stated that if there were any trouble it must be either of the two rings between 1,600 feet and 2,000 feet.

So far as is known this is the last time that Fluvian was seen alive.

About 10 a.m. No. 3 cage was rung to surface for the purpose of turning it over to the mechanics for repairs to the door. All the ordinary work about the mine is done on No. 4 cage which operates in balance with No. 3, the balance position on the morning of the accident being the 2,800-foot level ore pass; hence, as No. 4 cage was doing no work below the 2,800-foot level, No. 3 cage was not coming through to surface on any of the ordinary trips.

When, however, No. 3 cage was brought to the surface for the above-mentioned repairs, the deckman, Wm. Andrews, noticed a miner's rubber boot on the hood rubbing against the front guide on No. 4 compartment side. Feeling that something was wrong, Andrews rang the cage down to a position where he could recover the boot and discovered that it encased a portion of a human leg and foot.

An immediate search was instituted, which resulted in the finding of Fluvian's body floating in the sump under No. 4 compartment. The body was practically stripped of clothing and terribly injured.

It is evident that Fluvian must have gone out of the manway compartment into the hoistways at one of the two rings between the 1,600- and 2,000-foot levels and had either slipped off the timbers or been struck by a moving cage and knocked down the shaft, although no traces could be found on the shaft to indicate what had actually happened.

Examination of both these water rings immediately after the accident revealed no conditions which could account for Fluvian's going out on the timber around the hoisting compartments.

An inquest was held at the mine on February 12, before Coroner H. M. Torrington, M.D.

Louis Sever, Jugo-Slav, aged 35 years, married, with wife and two children residing in his native land, sustained a compound, transverse fracture of the tibia

and fibula of the left leg about 2.30 p.m., February 13, when a piece of loose ground he was attempting to take down fell sooner than he expected and struck him.

Sever had worked at Creighton for over two years and at the time of the accident was employed as a scaler and, having sustained a strained back about a week before this accident, had been withdrawn from the heavier work of scaling in the stopes and placed on lighter duty in scaling drifts and crosscuts.

When the accident happened Sever was working alone taking down a piece of rock weighing about 300 pounds, which his shift boss had observed on 11.13 platform, 26th level, and sent him to take down.

After the accident Sever stated to the shift boss, J. Cullen, that he was gadding the piece when it unexpectedly fell and caught him.

On being taken to the surface following the accident Sever was treated in the first-aid room by Dr. E. G. Bell, the resident physician at Creighton. Dr. Bell administered a hypodermic of morphine, as the patient seemed to be suffering from shock, placed the leg in splints and had him sent to the Copper Cliff Hospital, where he was further attended by Drs. Campbell, McCauley and Feldhans.

Nothing unusual was noted in Sever's condition until about noon on February 14, when alarming symptoms set in very rapidly. The patient became very drowsy and developed a state of severe cerebral irritation in which his whole body became very rigid, so much so, it was testified, that if an attempt were made to raise his head the whole trunk would have to be raised with it, or if an arm or leg were raised it would remain fixed in the position to which it was elevated until again forced down.

Being unable to satisfactorily diagnose the condition of the patient, the Copper Cliff doctors called in Doctors Cook and Dales, of Sudbury, in consultation on the case and a tentative diagnosis of cerebral embolus was made. (This is a phenomenon of some foreign matter from the wound getting into the blood stream and being carried to the brain where its lodging may give rise to numerous symptoms.) According to the medical testimony in this case the foreign matter would probably be fatty substances from the crushed bone in the leg.

Sever's condition remained much the same until death occurred on February 17, although some of the rigidity seemed to be gradually lessening on that day, as his jaw, which had been firmly closed since the condition had first set in, dropped open some time before he died.

In stating the cause of death, Dr. W. C. Campbell, who gave evidence at the inquest, said he felt that the broader term of "cerebral complications as a direct result of the injury" would be a more proper designation than to definitely state that it was a case of "embolism."

An inquest was held at Creighton mine, on March 16, before Coroner G. A. Henry, M.D., who returned a verdict to the effect that Louis Sever died as a result of injuries sustained when struck by a falling rock in Creighton mine.

Svante Wiita, Finn, married, with his wife and three children residing in Finland, sustained a complete, compound, backward dislocation of the right knee joint about 9.30 a.m., April 16, when he became entangled in a loop in a hose attached to a stoper drill and the hose became further caught on a projection on a car of a passing train in the main north drift, 30th level, Creighton mine.

Wiita received first-aid treatment at the mine at the hands of Dr. E. G. Bell, resident physician, and was removed to the Copper Cliff Hospital shortly after the accident.

The dislocation was reduced on his admittance to the hospital and an effort was made to save the injured limb.

The circulation was poor in the affected leg, however, and about the fifth day following the accident gangrene developed.

The hospital doctors vainly tried to persuade Wiita to submit to an amputation as soon as the gangrenous condition was noted, telling him that his only chance of life lay in having the amputation performed. Wiita, however, was quite obstinate in his refusal and it was not till the ninth day after the accident that the doctors, through some of his friends and acquaintances at the mine, were able to gain his consent to the operation.

The amputation was accordingly performed shortly before noon on April 26, but Wiita died during the afternoon without having regained consciousness following the anaesthetic. Death was attributed to shock following the amputation, in conjunction with a lowered resistance due to septic absorption.

At the time of the accident Wiita and his helper, T. Tervo, timberman, were drilling holes in some loose ground in the back of the drift with a stoper drill, preparatory to replacing the existing timbering with heavier sets. The hose connections to the drill were taken off a pipe line on the mucking platform in the drift and it is evident that the hose had shifted into a position where it hung off the end of the platform to become caught by a car of the passing train.

When the accident happened a train was being backed in past the timbermen and Wiita's leg became caught in a loop in the hose near the machine when the car caught the hose where it hung off the platform. Wiita was dragged a distance of about ten feet before the train was stopped.

The evidence presented at the inquest disagreed as to whether or not Wiita had had any warning of the approach of the train. Tervo swore that they neither saw, heard nor were warned of the oncoming train, although he stated that at all previous trips of the train that morning a trammer had preceded the train to warn them of the approach.

Steve Meniennin, the motorman in charge of the train, stated that the trammer had preceded the trip as usual at the time of the accident and further claimed that it was on a signal from this man that he had stopped the motor after Wiita was injured. He also claimed that this trammer told him following the accident that he had warned Wiita and that the latter had replied that he was clear and to proceed with the trip.

None of the witnesses at the inquest could recall the name of the trammer who had acted in the capacity of lookout on the morning of the accident, thus no corroboration of either version was possible.

Wiita was an old employee at the mine, having worked there practically continuously since 1925, and was regarded by all as a very reliable and careful man.

An inquest was held at Creighton before Coroner H. M. Torrington, M.D., on April 29, when the following verdict was returned:—

"That Svante Wiita came to his death at the International Nickel Company's hospital, Copper Cliff, Ontario, on Friday, April 26, 1929, from shock following amputation of leg, and septecaemia. Result of accident received at Creighton Mine. Permission to amputate sooner had been refused, and septicaemia and shock following accident."

N. Pecarich, Pole, aged 34 years, married, with his wife residing in Poland, was instantly killed on the 2,800-foot level of the Frood mine about 10 p.m., August 7.

At the time of the accident, Pecarich, a drill helper, and his partner, N. Rohozynsky, were drilling a round in 21 No. 7 boxhole raise, using a stoping machine. Two cut holes had been drilled and the third hole had been drilled to a depth of about one foot when an explosion took place through the drill striking an unexploded charge in an old bottom. The force of the explosion broke the staging on which both men were standing and they fell a distance of about ten feet to a lower staging. Pecarich was instantly killed, while Rohozynsky was but slightly injured.

After the accident the steel was found stuck in the hole and when it was removed small pieces of powder wrapper were found in the bottom of the hole.

In giving evidence at the inquest, Rohozynsky stated that he had thoroughly washed down the face before starting to drill. The location of the missed hole, about one foot from the bottom of the old "burn" cut, and the condition of another bottom noticeable in the face after the accident, points to the possibility of the missed hole having been squeezed shut in the blasting of the previous round and thus escaping detection before drilling was commenced.

An inquest was held at Frood mine, on August 13, before Coroner H. M. Torrington, M.D.

Enrico Frantini, aged 24, Italian, single, was killed at the Creighton mine about 12.30 p.m., September 5. Death was due to falling down an ore pass from the 36th level to the muck immediately below the 39th level.

Frantini, along with two partners, Angelo Mortri, an Italian, and Wenni Wiita, Finn, was sent on the morning of September 5 to the 36th level to slab the west wall opposite the mouth of the ore pass in order to make room for the square-set timber which was to form a permanent support for the back. The ore pass had been completed previously and was put into use as a dump hole on August 10. The only work which remained to be done was to install the square sets.

John Salo, shift boss in charge of this work, instructed these men to drill three short holes. Salo saw the men on his rounds early in the morning and again about lunch time, when they blasted the three holes. He then instructed them to set up on the opposite side of the pass and drill three further holes. They blasted the first three holes and retired for lunch and to wait until the smoke had cleared. Returning from lunch, Mortri and Wiita were preparing to set up as directed by Salo. Frantini, without instructions, proceeded to scale over the ore pass. The mouth of the ore pass was guarded on the north and south by a 2-inch by 4-inch hand railing and on the west by a 10-inch by 10-inch dump bar. In order to reach the back, Frantini climbed up on the dump bar. It is not known why he decided to scale immediately over the ore pass as it was impossible for anyone to be endangered by loose being there.

Neither of his partners were watching him at the time he fell, but evidently Frantini's foot slipped from the 10-inch by 10-inch bar, causing him to lose his balance and fall down the pass. The body was recovered through the by-pass to the 39th level about 2 p.m.

Dr. E. G. Bell reported death due to fracture of the base and the vault of the skull, which affected the brain. He explained that these injuries were no doubt sustained during the fall. The deceased showed no signs of suffocating while in the muck through which he was pulled to the by-pass, a distance of about 20 feet.

The inquest was held at Creighton mine, on September 11, before Coroner J. S. McKessock.

Mati Antila, aged 24, Finn, single, died from shock and loss of blood, caused by a blasting accident which occurred on the 2,800-foot level in the North Frood mine, at about 3.30 a.m., October 16. Although Antila showed signs of life when he was brought to surface, he died shortly after without regaining consciousness.

The accident occurred in No. 2 fill drift on the north side of No. 40 crosscut, about 50 feet west of the main north drift, on the 2,800-foot level. A boxhole had been driven at this point from the old Mond workings, which are eight feet below the new level. In order to advance the face of the fill drift the necessary distance, the bottom of the boxhole had to be taken up. To accomplish this down-holes had been drilled previously, but had not been blasted. During the early part of the shift on which the accident happened, the night foreman and the level boss, Charles Houle, visited No. 40 crosscut together. They noticed that the afternoon shift had blasted some of the holes in No. 2 fill drift and that there were two missed holes. The night foreman instructed Houle to have these two missed holes blasted along with three other holes that remained.

Mati Antila, a drill runner, and his partner, Emil Hautala, were drilling in No. 7 boxhole, which is on the south side of No. 40 crosscut, near No. 2 fill drift. Houle instructed Antila to blast the five holes in the nearby heading at lunch time.

At about 3.30 a.m. Antila and Hautala loaded the holes. Antila lit them and the two men left the face together. Antila went south to the main drift to guard No. 39 crosscut and his partner went north to No. 41 crosscut.

The level boss, who was returning from the north end of the main drift, states under oath that he heard five holes go. He proceeded south past No. 40 crosscut. Hautala accompanied him as far as No. 40 crosscut and told Antila that he had heard only four holes and not to go in. Not heeding the warning, Antila proceeded alone to the face. As nearly as can be estimated, he arrived there just as the hole went off. This would be about four minutes after the fourth hole exploded.

No plausible explanation could be found for the lapse of time between the exploding of the fourth and fifth holes. Hautala. on being questioned on the day of the accident, could not recall that any of the fuse used were old or in bad condition and was of the opinion that the cutting should have timed the shots equally. The fuse were all thought to be 10-foot lengths and each hole was given about a two-inch lead over the following one.

Hautala's evidence showed that they had been instructed to wait 30 minutes before returning to a face where a missed hole was thought to exist.

No explanation was forthcoming as to why Antila returned to the face before eating his lunch.

The inquest was held in the superintendent's office, at the Frood mine, on October 17, before Coroner H. M. Torrington.

Kalle Hytanen, 28, single, Finn, died in the Copper Cliff Hospital about 10 p.m., October 25, as a result of injuries received in falling about 180 feet down a raise, inclined at 65 degrees, on the 2,000-foot level of the Frood mine. The accident occurred about 9 a.m., October 25.

Hytanen, when brought to surface, was conscious and able to talk. He was then suffering chiefly from a compound fracture of the right leg. He was cut about the hands and scalp. After being taken to the hospital he appeared strong and every hope was held for his recovery. He passed a good night on October 24, but about 10 o'clock on the morning of the 25th lost consciousness

and never recovered. An operation on the scalp failed to relieve the pressure on the brain and he died about 10 p.m., from a brain condition.

The raise in which the accident occurred is a section of No. 1 fill raise and was being driven from the 2,000-foot level to the 1,600-foot level. On October 24, the work had advanced to a point some 75 feet above the 1,800-foot level, at which point a small amount of lateral work had been done to make room to store materials and to mount a tugger hoist. Above the 1,800-foot level the raise is offset 12 feet.

The raise is carried in two compartments. A cribbed compartment, about five feet square, contains a ladderway and a steel chute. A tugger hoist on the 2,000-foot level and one on the 1,800-foot level operate small skips in the steel chutes for raising and lowering steel and timber. The chute is 12 inches wide and 8 inches high, inside. The second compartment is not cribbed and is used for a rock pass.

On the morning of October 24 the raise crew, consisting of two runners and a helper, wished to ta' e sharp steel to the face. Hytanen, one of the runners, finding that the man who regularly operated the hoist on the 2,000-foot level for them was not on shift, asked Santala, the shift boss to send in another man. Santala sent in Lalonde, a nipper, whom he knew to have had experience with tugger hoists.

Hytanen, who wished to go to the 1,800-foot level, to transfer the steel to the other skip and hoist it to the face of the raise, stood on the skip and Lalonde hoisted him to a point somewhere near the 1,800-foot level. It is not known how he came to fall off but the small amount of clearance between the edges of the platforms and the sides of the steel chute, leads one to believe that he struck his head and lost his balance. He fell to the 2,000-foot level.

La'onde's evidence showed that he had been told previously, by the shift boss, that men were not to ride these skips. It also showed that he realized the danger involved, in that he first refused to hoist Hytanen, but later agreed to do it.

An inquest was held at the Frood mine on October 28, before Coroner G. A. Henry, M.D.

Mike Lubera, 29, Pole, with a wife and three children residing in the old country, was fatally injured at the Creighton mine about 10.05 p.m., December 5, and died in the Copper Cliff Hospital at 7.05 p.m., December 6. Death was due to brain injuries caused by a fractured skull.

Lubera and his partner, Mike Budjak, were pulling ore from No. 7-80 chute in the main south drift on the 26th level. The chute had been giving considerable trouble and, in pulling three trains, the chute blaster, who also acted as motorman, had blasted three times. Just previous to the accident the chute again hung up. Lubera was using a chute bar in an endeavour to loosen the muck. A piece of ore, weighing between 300 and 500 pounds, broke loose and fell a distance of about eight feet, coming to rest on the chute logs.

Lubera evidently struck his head a terrific blow on some flat object, since, although his skull was badly fractured, there was no scalp laceration. The only external mark on his head was a badly bruised spot above the ear about four inches back of the left eye.

It is possible that the piece of ore, in falling, struck the end of the bar and threw Lubera against the chute rail. Mike Budjak, who was standing a few feet from his partner at the time, was under the impression, however, that when the rock started to move Lubera jumped to attain a place of safety and struck his head against the chute rail.

The deceased was considered a careful and efficient workman. He was, however, disobeying instructions, inasmuch as he must have been standing in front of the chute to bar, rather than at the side.

The inquest was held before Coroner J. S. McKessock, at Creighton Mine, on December 10.

Frank Lovsin, 27, Jugo-Slav, with a wife and child residing in Creighton, died in the Copper Cliff Hospital, at 5.10 a.m., December 7, as a result of injuries received in an accident which occurred at the Creighton mine on December 5, at about 10.05 a.m.

At the time of the accident, Lovsin, a chute blaster, was endeavouring to clear the loose muck from around the edge of a big, flat slab of ore which was completely covering the top of the boxhole leading to No. 1 15-1 chute in No. 17 sublevel north. The idea was to allow the slab to settle enough to be able to go into the chute and drill and blast it.

J. Laine and Y. Macnpaa, two timbermen, had been detailed by their shift boss, C. Fenton, to repair some timber in No. 17 sublevel north and to drill off the slab when it had settled sufficiently.

Lovsin had blasted once for them at the end of the previous shift. On the morning of December 5 the timbermen again obtained the services of the chute blaster. He had blasted four times, using powder on the end of blasting poles. After the fourth blast he went into the chute in an endeavour to ascertain whether the slab had settled sufficiently. While he was in the chute some fine muck came loose. Lovsin was in the act of retiring from the chute when a piece of ore, estimated to be about one cubic foot, fell from the hung-up mass and struck him on the chest. He lost his hold on the chute rail and fell into No. 14-0 ore pass, the mouth of which was immediately in front of No. 15-1 chute.

Lovsin fell about 26 feet to the muck in the ore pass, receiving a laceration on the left side of the scalp, a fractured skull, a fracture of the left upper arm, badly cut lips, and a laceration on the left shin. His condition was considered hopeless from the time he was first examined by the medical authorities.

Evidence was submitted at the inquest to the effect that all men engaged in chute blasting are warned never to go into a hung-up chute unless the shift boss is present. The accident might have been averted if this rule had been adhered to.

The inquest was held at Creighton mine before Coroner J. S. McKessock on Tuesday, December 10.

The following men met instant death at the Levack mine shortly after 2.45 a.m., December 15: Sam Spak, skiptender, 33, Russian, single; John Kymalainen, shaftman, 32, Finn, single; Vaino Kanerva, shaftman, 34, Finn, with wife and two children residing in Finland; Harry Motto, shaftman, 32, naturalized British Subject, with wife residing in Sudbury.

Their death was the indirect result of a fire which broke out in the motor room of the Symons cone crusher and which completely destroyed the headframe, the crusher plant and the rock-house. The old transformer-house was also badly damaged. The four men were riding in the sinking bucket from the 8th to the 3rd level, when the cable of the skip, which was hanging in the same compartment at surface, burned off and allowed it to descend on them.

The fire was first noticed by Nick Sasich at about 2.45 a.m. Sasich was on his way from the magnetic concentrator to the dry. As he passed the motor

room, which is an annex to the main building, he noticed flames apparently coming from the motor. Tomo Makicevic, an oiler, working at the Symons crusher, must have become aware of the fire at about the same time. The two men, after throwing the switch to shut the motor off, tried to extinguish the blaze with snow. Their testimony left little doubt that the fire originated from the motor. Although at first the fire seemed to be in the motor only, their efforts with snow were of no avail and it gained headway so rapidly that they were soon forced to abandon their post.

Bill Temezuk signalled the rock-house to stop the belt and later went to the picking room to warn the men there of the fire. There were 28 men on shift throughout the plant when the fire broke out, all of whom escaped safely.

The rock-house foreman, Jim Langdon, discovered the trouble some few minutes after the fire had started. He did not stop to examine the motor room but proceeded at once to have the fire pump started and to endeavour to get a hose line into action. He also warned the hoistman of the trouble.

Although Langdon claims he ordered the pumps turned on within five minutes of the time the fire was reported, it appears to have been upwards of twenty minutes before water came on the line. Fire pump equipment consists of an electrically-driven pump with an internal combustion engine as a standby. The electric pump was started at the time Langdon gave the order, but for some unknown reason it would not pick up the water. The master mechanic, when examined, swore that the pump had received a test some two weeks previous to December 15 and that it was then in good order. Water pressure eventually came on the line about 3.10 a.m., but by that time the fire was beyond control.

The main shaft of the Levack mine has five compartments and is inclined at 65 degrees. The headframe was of unit construction with the crusher-house. The two east compartments, Nos. 1 and 2, have been in constant use as skip compartments, as has No. 5 compartment, the manway. Nos. 3 and 4 were being equipped as skipways and at the time of the fire they were practically ready to go into operation. No fire damage was done below the collar of the shaft.

Shaft sinking, which started below the 8th level on May 13, 1929, was completed to the 13th level about the end of September and since that time the shaft crew have been engaged in cutting the lower level stations, timbering and tight-lining the shaft and preparing to put Nos. 3 and 4 compartments into operation. Sinking operations had been carried on by means of a hoist set on the 3rd level operating a bucket in No. 3 compartment. Throughout the sinking a solid bulkhead of 10-inch by 10-inch timbers was maintained over 3 and 4 compartments immediately above the 3rd level for the protection of the men at the shaft bottom and later while timbering and installing rails and guides.

On morning shift, Saturday, December 14, the new skips were attached to the cables and hoisted into position in the headframe, some 30 feet above the surface, where they were allowed to remain with the hoist brakes set. Afternoon shift had proceeded with the removal of the bulkhead above the 3rd level and night shift was to start dismantling the sinking hoist after removing the skids from the lower portion of the shaft. The new skips were to have been run through the shaft on Monday, preparatory to going into service.

Pete Laberge, the hoistman on No. 1 hoist, as soon as he received the alarm from Langdon, telephoned underground to his shift boss, Joe Ressel, to warn him and to ask what he should do with the skips in Nos. 1 and 2 compartments. Ressel ordered the skips to be lowered to the pentice below the 8th level. Laberge

fulfilled this order and later, after consulting with the night watchman, broke into No. 2 hoist-house, which was locked, with the intention of lowering Nos. 3 and 4 skips. He decided, however, that since he knew nothing of the conditions in the shaft and had no instructions, he should not move them.

Ressel was on the 8th level, along with Albert Dockrell, the shaft leader, four shaftmen and two skip-tenders, when he received the telephone message from Laberge. He at once ordered all the men on the 8th level to take the manway to the 7th and proceed from there to surface by way of the escapement shaft. Ressel then left them and climbed to the 7th and 5th levels to warn the rest of his men.

Dockrell testified that a second telephone message came to the 8th level shortly after Ressel started to climb the manway. He, Dockrell, answered the telephone, and while he was talking three shaftmen and one skip-tender got into the bucket and rang for the 3rd level. Although he called to them to stop, they paid no attention. Dockrell and the two men with him heard the crash of the skip as it tore out the sinking sheave above the 3rd level and collided with the bucket on which the men were riding, at the 5th level. Dockrell and the other two men climbed safely to surface as the shift boss had instructed.

The underground force, at the time the fire broke out, numbered 49. Most of these men were trammers on the 5th and 7th levels. They all reached surface in safety through the escapement shaft, with the exception of those noted above. The main shaft, which was ordinarily upcast, probably became more so under the fire condition. At any rate all witnesses seemed to agree that very little, if any, smoke entered the mine through it. The escapement shaft, being downcast, drew in some smoke, but this was not in sufficient quantities to cause trouble at any time. Mr. Sharp thoroughly examined the mine Sunday morning about 8 o'clock and, outside of two smouldering sticks of timber which were caught at different places in the shaft, found no fire underground.

The inquest was held at the Levack mine on Wednesday, December 18, before Coroner Dr. Henry.

Aloji Sitar, 28 years of age, Jugo-Slav, with a wife residing in his native land, was fatally injured at the Creighton mine at about 9.30 p.m., December 28, and died in the Copper Cliff Hospital at 4.40 p.m. the following day. Death was due to a fractured skull.

Sitar was a drill runner's helper and, at the time of the accident, was employed in No. 9-01 pillar recovery raise above the 18th level, along with two drill runners and another helper, P. Galipeau.

This is a vertical, square-set raise starting from a sub-level about 30 feet above the 18th level. For convenience in handling steel, timber and other materials a tugger hoist had been set up in the sub-level, 34 feet from the foot of the raise. The cable passed through two snatch blocks, one at the bottom of the raise and the other at the top. The layout made it necessary, when the hoist was in use, to station a signal man in such a position that he could transfer signals from the men at the face to the hoistman.

At the time of the accident the crew were lowering four blasting timbers. The two drill runners were on the top set, and the deceased was at the bottom of the raise signalling to Galipeau who was running the hoist. Three of the timbers had been disposed of and the fourth was attached to the cable in the usual way. Galipeau testified that he received the signal to hoist about three feet to allow the timber to swing clear in the raise. When he had done this Sitar called to him to let out slack. Galipeau ran off a few feet of cable, but Sitar called for more, so he released the brake saying, "Pull off what you want." Galipeau

thought Sitar pulled off 10 or 12 feet more before he again set the brake. Then the cable suddenly tightened and Galipeau noticed that his partner's light was out. He received no answer when he called and when he went over to the foot of the raise he found Sitar unconscious. Both men at the top of the raise swore that as far as they could see nothing out of the ordinary had occurred. They gave the signal to hoist first and when the timber had swung clear their signal to lower was answered by its slow descent. The first intimation they had of an accident was when Galipeau called up the raise that Sitar was hurt.

Apparently after the timber had swung clear it caught some place. Why Sitar required all the slack could not be determined, but evidently after the slack had been taken off the drum the timber loosened and, in falling, pulled the cable taut with a jerk. There were marks on Sitar's throat, which looked as though they were made by the cable, and a clot of matted hair and flesh on the roof of the drift. This led to the belief that the cable, when it snapped to a taut position, caught him under the chin and threw his head against the roof, causing the skull fracture. Sitar never regained consciousness.

The inquest was held in the superintendent's office at the Creighton mine, before Coroner Dr. Torrington, on January 3, 1930.

Keeley Silver Mines, Limited

Oscar Provencher, married, aged 30 years, French, employed as a machine helper at the Keeley mine was blasted in No. 830 crosscut on the morning of February 16. He died on February 19, as a result of the wounds. Arthur Hardy, machine runner, had an arm broken and his eyes injured.

Arthur Hardy was starting the eleventh hole, about one foot from the bottom of the right side of the face, when the explosion occurred. None of the holes of the previous round broke to the bottom. Bootlegs of about 10 inches were left in the face and none of the holes were started in a bootleg. The missed hole must have been cut off by the lifter leaving a smooth face. The face had been washed down by Hardy. From the position of the machine, the hole was started about one inch from the missed hole. The missed hole was about one foot deep and must have contained two or three sticks of powder.

The inquest was held in Cobalt on February 20.

Lake Shore Mines, Limited

D. McDonald, single, aged 33 years, employed at the Lake Shore mine as a pipefitter underground, was injured on February 23, at 10.30 a.m., and died on February 26, at 7 a.m., as a result of the accident.

McDonald was helping to install the six-inch air line from the 1,600-foot level to the 1,400-foot level in No. 3 shaft. A. La Chance and V. Dubeau were working on the pipe line 24 feet below the 1,400-foot level. McDonald was on the 1,400-foot station and was asked by La Chance to bring down some lag screws. McDonald took the lag screws down without a light. La Chance gave him an axe to take to the level and Dubeau gave him his lamp to be filled with water. The lamp was out at the time. McDonald got up the manway one set, then fell into the skip compartment. A three-inch pipe, lying across the shaft 24 feet below the point where McDonald went through, caught him and saved him from falling to the 1,600-foot level.

The lagging had been left off at this point to allow the shaftmen to lower the guides into the skip compartments. A pentice had been left just below the 1,400-foot station, as cages were temporarily installed in the skip compartments above the 1,400-foot level.

The inquest was held on February 27. The jury brought in a verdict of accidental death, with a recommendation "that guard rails be put in all compartments open to a manway."

James Burton, English, single, 28 years of age, was fatally injured at the Lake Shore mine on December 29, at 1.40 p.m., and died at 10.30 p.m.

The accident occurred at No. 5 raise, No. 1,401 west stope. The stope is up within 50 feet of the 1,200-foot level. The raise is 65 degrees for the first 30 feet and 40 degrees from that point to the bottom. It is equipped with a ladderway and a plank chute, about 18 inches wide, for the steel-bucket to travel in. The steel-bucket is constructed of 2-inch by 8-inch plank, four and a half feet long, with a 5/16-inch cable wrapped twice around the length of the bucket and the ends clamped so that there are three loops for a bail.

At the time of the accident, A. McGarry and Allen Carswell, timbermen, were repairing the platform at the top of the raise. James Burton and his helper, Hilyard Liscumb, were operating a machine about 25 feet east of the raise in the stope. After repairing the platform the timbermen were replacing the bucket in the chute and, in doing so, allowed the bucket to take up about 10 inches slack. The bail of the bucket broke, allowing it to drop to the bottom of the raise. Liscumb stated that Burton was going for a steel when he was hit by the falling bucket. Burton and Liscumb had not been warned of the work going on at the top of the raise. Dr. Cameron stated that Burton had a fracture at the top of the skull about two inches square and that the brain was badly injured at the base of the skull.

An inquest was held by Coroner Dr. Armstrong, at Kirkland Lake, on December 30. The jury returned a verdict of accidental death without any blame attaching to any one.

McIntyre Porcupine Mines, Limited

Nick Cicci, Italian, aged 32 years, single, was killed in No. 2,522 south stope of the McIntyre mine on July 27.

No. 2,522 stope is a cut and fill stope with the ore chutes about 35 feet apart. The chutes are four feet square on the inside and are lined with a three-inch plank. The chute where the accident occurred was a manway.

On the shift previous to the accident a breast was drilled and blasted directly over the chute, leaving about 10 feet of muck over the chute.

At the time of the accident Cicci was warned that the chute was hung up. According to the evidence, Cicci went into the stope and, with the help of one of the muckers, put a 16-foot plank on the muck over the chute. However, when he was crossing, the muck suddenly dropped away, causing the plank to tip sideways. Cicci's feet must have both slipped off the plank on the same side, causing him to drop feet first into the chute, He was covered with about 10 feet of muck. In about one hour his head was uncovered by cutting through from the manway. He was dead.

Dr. Moore stated that death was caused by smothering due to compression.

An inquest was held at Schumacher, on July 29, by Coroner Frank Evans.

Mond Nickel Company, Limited

Wasyl Procyk, drill helper, Ukrainian, aged 29 years, married, with his wife residing in the old country; Egnorc Vrtoveic, drill runner, Jugo-Slav, aged 27 years, single; and Emil Saari, drill runner, Finn, aged 27 years, single, were

suffocated when caught in a run of broken ore in a small, underhand stope being worked in connection with the recovery of a 25-foot square pillar in No. 7.4 north stope at the Levack mine, about 7.30 a.m., April 4.

All the men were fairly old employees at the mine, Procyk having worked there for 18 months, Saari for the past four years, and Vrtoveic for about three years.

The No. 7.4 north stope, on the stope floor elevation, did not have the full width (100 feet) usually carried as the stoping width at Levack, the west wall of the stope being formed by the footwall contact, which dips east at approximately 50 degrees at this point. Hence, in working this stope upwards from the 7th level, the width increased, due to this dip to the footwall. When approaching the 100-foot width, a series of 25-foot-square pillars was left along the west wall of the stope at approximately 60-foot intervals to provide adequate support to the back. These pillars were cut on three sides only, the fourth side (the west) not being cut off the footwall.

At the time of the accident recovery operations were being carried out on the pillar in which the accident happened. The general scheme of recovery on this pillar had been the driving of a boxhole raise from a crosscut under No. 7.4 stope in an easterly-inclined direction until the footwall was reached, when the raise was turned over and driven in a westerly-inclined direction up the footwall on the centre line of the pillar. The raise had been driven to the top of the pillar from which point a break-through had been made to the stope and thus access afforded from the 5th level through the regular stope manway. A small, underhand stope had been started, breaking into the raise at the top of the pillar, and was to have been carried down to the base, the sides of the pillar being drilled off as this stope, which mined out the core of the pillar, was advanced.

Prior to the accident, work had been carried on to the stage where the second to the last bench of the underhand stope had been shot on the afternoon shift of the previous day. The intervening "graveyard" shift, which is solely a tramming shift, had pulled 25 cars of muck from the boxhole in the pillar on instructions from the foreman in charge of the shift which had shot the bench.

Joe Ressel, the day shift foreman on the morning of the accident, presuming the muck would have been pulled down below the bench, had instructed a crew of timbermen, on going on shift, to go to the pillar and place a stull on the footwall to attach the ladders to, and to use for erecting a staging across the open raise, and had told Vrtoveic and Saari, the two oldest of the three drillers, what was being done.

Nick Stoeff, the third driller working in the pillar, and a new man at the mine, having worked there only four shifts before the accident, and the only surviving member of the pillar crew, states that the muck had the appearance of having settled following drawing. He was the first man of the crew to enter the working on the morning of the accident and, finding the place quite gassy, took a water hose and wet down the muck after he, Vrtoveic and Saari had lowered a ladder and tied it in place.

This done, he was joined on the muck by Vrtoveic and Saari and somewhat later by Procyk, the helper, who did not reach the working place until a few moments before the accident.

Saari was standing against one wall holding the end of a scaling bar that he had pushed into one of the horizontal holes which had been drilled in the wall; Vrtoveic was leaning against the opposite wall with a shovel in his hands; Procyk and Stoeff were standing more or less in the centre of the opening and almost directly over the raise position. At this time Vrtoveic made a remark

to Stoeff which, while Stoeff appears to have taken it as said in jest, was possibly the means of his saving his life.

Vrtoveic remarked, "Watch yourself. Maybe chute fall." Stoeff replied jokingly, "I am not heavy," but stepped three or four feet towards the ladder and was able to grasp the water hose when, practically at that instant, the muck did collapse.

Stoeff, who is an experienced miner, claims that he neither saw nor heard anything which would lead him to believe that anything out of the ordinary was about to occur or that Vrtoveic was speaking seriously and the fact that he replied in a light mood and that Vrtoveic does not appear to have made any effort to protect himself, makes it seem that there could have been no warning of the impending collapse.

Stoeff was carried down with the slide, probably as far as the slack in the hose would allow, and was buried to the hips and unable to extricate himself until a second subsidence occurred, which left him free and able to climb out of the working and spread the alarm.

At first an attempt was made to reach the buried men from the top of the muck, but it was soon seen that this method was going to be too slow to be of any possible benefit in saving the men's lives and, as the muck was extremely fine, it was thought that the only possible chance they had was to pull the chute. The fineness of the muck, while giving hope that the men might be pulled through the chute without excessive injury, was distinctly a menace to the men's lives as long as they remained buried, as it practically precluded the possibility of sufficient air reaching them to sustain life for long.

The bodies were recovered from the chute within 20 to 30 minutes from the time pulling was started, Procyk being taken out first, quickly followed by Vrtoveic and Saari.

Procyk was quite badly injured, having sustained numerous cuts and bruises, in addition to having both his arms and legs broken, as well as a fractured left jaw. Vrtoveic had his left arm broken and a bad cut on the back of his head, while Saari was practically uninjured externally.

The varying extent of the injuries would seem to be accounted for by the positions in which the men were at the instant the muck collapsed. Procyk, who was almost directly over the raise, must have dropped through and received his injuries by having the bulk of the muck fall on him, while Vrtoveic probably slid in from the side with the muck, and was considerably less injured, and Saari, who had a grasp on a scaling bar in a side hole, probably momentarily checked his fall and slid in with the running muck.

An unsuccessful attempt at resuscitation was made on Vrtoveic and Saari, but was given up after about three-quarters of an hour, when it was seen to be of no avail.

An inquest was held at Levack on April 6, before Coroner J. S. McKessock, and the following verdict returned:—

"That Wasyl Procyk came to his death from suffocation and also received other injuries which would have caused death, in an ore chute at Levack mine, on April 4, 1929. The chute had been partly drawn, but the ore or muck in its upper portion jammed, holding a portion of the ore at the top of the chute, which gave way when the deceased and other workmen were upon it. He was drawn into the chute and more ore fell in upon him, causing his death by suffocation. The ore at the top of the chute appeared to have settled and there was nothing to indicate a jam in the chute and his death was accidental or by misfortune.

That Emil Saari died from suffocation in an ore chute at Levack mine, on April 4, 1929. The chute had been partly drawn . . . etc., etc.

That Egnorc Vrtoveic died from suffocation in an ore chute at Levack mine on April 4, 1929. The chute had been partly drawn . . .etc., etc."

Nipissing Mining Co., Limited

Henry Brodeur, aged 37 years, Canadian, married, with his wife and two children residing in Cobalt, was instantly killed at the Nipissing mine on June 17, at 11.20 a.m.

At the time of the accident Henry Brodeur, Oliver Bourque and Joseph Vallier were lighting a round of 25 holes in an underhand stope. The bottom of the stope was at an angle of 30 degrees and the distance from the drift to the back of the stope was 70 feet. The deepest place was 25 feet below the drift.

A cut had been taken out of the bottom and 7 holes were drilled in the first bench, 11 holes in the second bench and 7 slash holes drilled up in the end of the stope, the collars of the slash holes being about shoulder-high.

Joseph Vallier lit the first bench, Oliver Bourque the second and Henry Brodeur the slash holes. The stope is about three feet wide. The slash holes were drilled, three on the outside, then two and two backholes. Brodeur was having difficulty with the second backhole on the right.

Bourque, in his evidence, stated that he split the fuse in this hole and held it while Brodeur lit it. Almost at once Bourque noticed the long flash (12 to 14 inches), and called to the others that it was a quick fuse. At the same time he caught Brodeur by the coat and was pulling him away when the hole fired. He thought it was about 10 seconds after it was lit. Brodeur was between the shot and Bourque; both men were knocked down and Brodeur was hit by a piece of rock which crushed his skull on the right side. Bourque and Vallier carried him about 25 feet, then, thinking him dead, left him and climbed up the incline to the drift. Just as Bourque reached the top of the incline the second shot went. He thinks this was about a minute and a half after the first shot. Bourque also stated that all the fuse were six feet long, and that none of the fuse were cut. The sequence of the firing was to be controlled by the time of lighting the fuse.

From an examination of the slash after the accident, there is no doubt that the second backhole on the right fired out of its turn, as it is a very light hole and there is only a small amount of rock broken off the collar. From the position of this hole it would appear that most of the rock broken must have been thrown over the men's heads; any outside hole would very probably have killed the three of them.

Vallier, in his evidence, said that he heard Bourque call, "Quick fuse," and that very shortly afterward the hole exploded.

An inquest was held in Cobalt on June 24.

The jury returned a verdict that Henry Brodeur was accidentally killed in the Nipissing mine from injuries sustained in a blasting accident. From the evidence available the jury believed the accident was caused by a premature explosion due to a defective fuse.

O'Brien Mine

Oseo Matte, aged 46 years, Canadian, married, with his wife and six children residing in Cobalt, was killed in No. 716 stope at the O'Brien mine, Cobalt, on July 30, at 2 a. m.

Matte had been employed at the mine since April, 1923, as a machine runner, and at the time of the accident was operating a small hoist pulling the muck up an incline raise about 30 feet and also doing the sand blasting for the muckers, who were mucking off the floor of the sublevel.

Matte had fired two sand blasts and had returned to fire the third. He had placed the charge on the rock and evidently was in the act of lighting the fuse when a circular piece of rock, about six inches in diameter, with very sharp edges, fell from the back and struck him in the neck, making a deep cut and injuring the spine.

Tom Jackson, mine captain, and P. D. Morrison, shift boss, both swore that the back had been thoroughly scaled before the men were sent to work. The loose fell from a cross-fault 20 feet above the floor and showed a slickensided face. It must have been loosened by the sandblast.

Matte died on July 31, at 5 a.m., in the hospital at Cobalt.

An inquest was held by Coroner Dr. Kane, on August 7. The jury returned a verdict of accidental death.

Oriole Mines, Limited

Lawrence Henry Spiers, aged 22 years, single, Canadian, was injured by a blast at the Oriole mine, Gauthier township, on August 28, at 11.45 a.m., and died from the effects of his injuries at the hospital at Kirkland Lake on August 29, at 7 a.m.

Spiers and Kosobuski, his partner, lit seven holes about one foot deep in a surface trench. The holes were spaced two feet apart, except one which was 10 feet away. Kosobuski lit six and Spiers lit the seventh hole. All the holes fired but the last one of the group of six. After 15 minutes both men returned to the trench and Kosobuski pulled the fuse out of the hole with the unexploded cap attached to the end. Spiers got a new fuse and cap and told Kosobuski that he would put the old cap in the hole with the new one.

Kosobuski swore that Spiers used a wooden loading stick to punch the hole for the cap and fuse and that the hole was full of water to the top. After watching Spiers insert the cap and fuse into the hole he turned his back to walk away and at that instant the hole went off. All the witnesses swore that three feet of fuse was used.

Spiers, in his ante-mortem statement, said that the hole exploded just as he applied the match to the fuse, but he did not give any reason for the explosion.

An examination of the place where the accident occurred, about two hours after the accident, disclosed a fuse which apparently was the one used by Spiers to reblast the missed hole. The fuse had not been burned and it would thus seem probable that the accounts of the manner in which the accident occurred are inaccurate. The only logical explanation the writer is able to make as to the cause of the accident is that Spiers caused an explosion in tamping the hole containing the old detonator which he had stated he was going to place in the hole.

An inquest was held at Kirkland Lake on August 30, before Coroner Dr. Edis, the jury returning a verdict of accidental death.

Teck Hughes Gold Mines, Limited

Joseph Ronick, Jugo-Slav, 38 years of age, married, his wife and five children residing in Kirkland Lake, was crushed to death between the skip and a divider in the south shaft of the Teck Hughes mine at 3.15 p.m., on May 31.

The shift, nine men, had gone down in the east skip and was starting to replace the old guides on the bottom four sets with new B.C. guides. J. Ronick

got off the skip and knelt on the divider between the skip compartments to remove the guide bolts; the west skip came down and caught him in this position.

The west skip was coming down very slowly and Ronick's body took enough weight that the dogs caught, stopping the skip. As soon as possible the shaftmen ran the west skip up and immediately took the injured man to the surface. Dr. Armstrong was called. Ronick was in a dying condition and died before reaching the hospital. Further examination by Dr. Armstrong showed that Ronick had a fractured arm, six ribs on the left side broken, crushing of the pelvis in several places, internal and external hemorrhages and a severe crushing over the heart.

The evidence at the inquest disagreed as to whether or not the shaftmen had been warned that the west skip was to be lowered. A. Lomond, deckman, swore that he told E. Stewart, shaft leader, that he was going to lower the west skip as soon as they reached the bottom in the east skip. E. Stewart stated that he did not hear the deckman say anything about lowering the west skip and that he intended going to the surface after the west skip when it was needed. The hoistman had not been warned by any one that the guides were to be changed and consequently was lowering the skip to the usual stopping place, having received the signal to lower from the deckman. It had been customary to run the skips out of balance when drilling and timbering. The day shift had finished drilling and had blasted the cut before coming off shift, so that the skip should not have been lowered out of balance as far as the hoistman was concerned. The accident was no doubt caused by the lack of cooperation between the shaft leader, deckman and hoistman.

An inquest was held at Kirkland Lake, before Dr. Edis, on June 1, when the following verdict was returned:—

"That J. Ronick came to his death in the south shaft of the Teck Hughes mine by an unavoidable accident with no blame attached to any workman."

Treadwell Yukon Company, Limited

Nick Liutek, single, aged 32 years, Ukrainian, employed as a miner at the Errington mine, was instantly killed shortly after 3 a.m., January 3, by concussion from a blast at a raise on the 300-foot level off No. 1 shaft.

Liutek and his helper, Rudolf Gragorech, working on the night shift, had finished drilling in the raise and had been told by the shift boss to blast as soon as they were ready.

The raise was, at the time of the accident, about 45 feet high on an inclination of between 45 and 50 degrees and 19 holes were to be blasted. The fuses issued for this work were put up in nine-foot lengths.

Liutek loaded the holes, cut the fuses, and lit them with Gragorech's assistance. After lighting the fuses the men removed the three planks of their staging and laid them away in the mouth of a branch which was driven off the raise, then came down to the level and were in the act of placing the chute boards in the chute when the first holes went. Liutek, who was standing on a short ladder directly in front of the chute opening, was thrown back against the wall of the drift by the concussion, while Gragorech, who was standing to one side out of the direct line of the raise, escaped uninjured.

At the inquest Gragorech testified that Liutek had cut lengths off his fuses of greater than three feet in timing his holes, but from the remainder of his evidence left the impression that he was not only a man with very little experience but little intelligence as well and it is doubtful as to what weight should be given

to his statements as to the length of fuse remaining in the holes when lit. It would seem, however, that too short fuse was probably a contributing cause of the accident.

Only a very superficial examination was made of the body by Dr. L. F. Clary, the medical attendant at the mine, and he was unable to state with any degree of certainty just what caused the death of the man, attributing it either to the direct action of concussion from the blast or to a fracture of the skull which may have been sustained when Liutek was thrown against the wall of the drift.

An inquest was held at the mine on January 11, before Coroner Thos. Stoddart, of Copper Cliff. The jury rendered the following verdict:—

"That Nick Liutek came to his death on January 3rd, 1929, on the 300-foot level, No. 1 shaft, of the Treadwell Yukon Company Ltd., at Bradley, from concussion of the brain caused by a blast of nineteen holes fired by the said Nick Liutek, and which exploded before he reached a safety point.

"That the said Nick Liutek accidentally, casually and by misfortune came to his death, and not otherwise."

Vipond Consolidated Gold Mines, Limited

Emilio Mion, Italian, aged 28 years, married, with a wife and child living in Timmins, was killed, and Angelo Stocco, Italian, aged thirty-four, married, with a wife and family living in Timmins, was injured, while sand-blasting large boulders at the foot of a boxhole chute from No. 200-H scaling stope on the 300-foot level of the Vipond mine. The accident occurred at about 10.30 a.m., on June 6.

Mion, Stocco, and one other were engaged, on contract, in the mucking of ore from two boxhole chutes depositing on the floor of the drift. Mion and Stocco were loaders, while the third man did the tramming. At the time of the accident, the trammer had gone to the station with a loaded car and Mion and Stocco had placed two sand blasts, of two and a half sticks each, on two large boulders.

The evidence, as given at the inquest, was that Mion cut only from one to two inches off the two-foot fuse provided by the company, that the powder, Forcite Gelatine 40 per cent., was not removed from the paper and that the powder was completely covered with fine muck.

Stocco, in explaining the accident, said he stood behind Mion a distance of perhaps ten feet, that Mion lit both fuse, that there was no delay in lighting, and that the explosion occurred almost as he lit the second fuse. Stocco could not say which went first. He was struck in the face by dust particles and blown down, but recovered himself and was about one hundred feet away when the second shot went. Relighting his lamp, Stocco went back to the scene and through the smoke saw the body of his partner horribly injured. Stocco then went to the shaft for help and was sent to the surface. Captain McQuarrie and others went in to the scene of the accident and found Mion's body. Both legs were broken below the knees and the head and body were badly injured.

Upon examination of the scene, a capped fuse ten inches long was found in a pocket of Mion's clothing which was lying on the rock pile. The remaining fuse in the container, similar to those used by the deceased, were tested and found to be normal Clover Brand.

Mion had worked at the Vipond, and in this particular place, for almost two years. Stocco is an old miner with twelve years' experience.

An inquest was held on June 14, by Coroner H. Montgomery, at Schumacher, when a verdict of accidental death was returned, attaching no blame to anyone.

Wright-Hargreaves Mines, Limited

Kalli Taavitsainen, Finlander, aged 36 years, married, with his wife and two children residing in Kirkland Lake, was fatally injured at the Wright-Hargreaves mine on September 8, at 9 a.m., and died at a hospital in Toronto on December 3.

The accident occurred in No. 1,754 stope, which was 2,000 feet long, 20 feet wide, and up about 75 feet from the 1,700-foot level. It is understood from the witnesses that the rock in the stope was somewhat in layers and subject to small air blasts, caused from small stringers of calcite in the rock.

Matti Tiainen, scaler, who was present at the time of the accident, stated that the four machine men and himself were scaling in No. 1,754 stope the morning of the accident. Taavitsainen was about to scale the back a short distance from the breast when the loose fell and struck him a glancing blow on the back, knocking him forward. None of the loose fell directly on him. From the evidence given by witnesses it would appear that the piece weighed about one ton. The witness said the loose was started by an air blast.

Dr. Cameron stated that the spinal cord was completely ruptured and that the man had no chance of recovery.

An inquest was held in Kirkland Lake, by Dr. Armstrong, on January 3, 1930. The jury returned a verdict of accidental death.

Henry Melong, aged 46 years, Canadian, married, with his wife and nine children residing in Kirkland Lake, was injured in the rock-house of the Wright-Hargreaves mine on September 21, at 9 a.m., and died on September 22, at 2 a.m., from a badly fractured skull.

There were no actual witnesses to the accident and Melong never regained consciousness. From the position in which he was found by Iver Oberson, Melong evidently climbed up on the rolls to look at the feed chute and was coming down on the other side when his feet slipped, causing him to fall backward and strike his head on the hub of the revolving wheel. It was in this position that Oberson found him. Oberson stated that it was only about two minutes from the time Melong left him until he found him lying on the rolls with his head bumping on the hub of the wheel.

Frank Dans, crusherman, stated in his evidence that he asked Melong to look after the jaw-crusher feed while he went for oil. Oberson stated that Melong asked him to look after the crusher feed while he did something to the rolls. Dans swore that the mill was running in good order when he left and that he was only away about 15 minutes. No one seemed to have any idea why Melong went to see the rolls.

An inquest was held on September 23, by Coroner Dr. Armstrong. The jury returned a verdict of accidental death.

Metallurgical Works

International Nickel Company of Canada, Limited

Mike Gudac, labourer, was fatally injured by falling off a floor in the cinter building of the refinery at Port Colborne, at about 10.15 p.m., April 15, and died in the Welland Hospital on April 20. He was a Jugo-Slav, 29 years of age, with a wife and child in Jugo-Slavia.

He had been employed by the company since July, 1928, and for the past three months had been working at No. 4 cintering machine. His duties were to remain at the end of the machine and occasionally spray the hot cinter as it dropped off the conveyor.

The dust and fumes from the receptacle into which the cinter drops are carried away by a wooden hood about five feet above the floor. This hood collects a black dust on the outside to a depth of about one-eighth of an inch.

The platform had an iron railing on the exposed sides to the south and west. The Standard Steel Company were erecting another cintering machine on the west side. The railing on this side was removed by them four or five days previous to the accident. This left one side of the floor unprotected, with a drop of about 20 feet to the floor below. The distance from the machine where Gudac stood to the opening was seven and a half feet.

Wasyl Strapny, the attendant at No. 3 machine, came over and was standing talking with Gudac. An oiler, John Staples, came from the front of the machine and knocked the dust off the hood with an iron rod. This was not any part of Staples' duties. Gudac and Strapny were seen to fall off the platform backward to the floor below. Witnesses stated that one of them started to fall and grasped the other, but could not say which fell first.

Staples stated in his evidence that he asked the two men to stand back, as he was going to knock down the dust. He says that they stepped back and were standing at the edge of the platform when he struck the hood. The other witness of the accident, a machine tender named Edward Bull, who was about 20 feet distant, stated that the two men stepped back to avoid the cloud of dust after Staples had knocked it down.

Gudac received a badly fractured skull and Strapny's leg was broken above the ankle. Both men were removed to the hospital at Welland.

An inquest was held at Port Colborne on April 26, by Dr. Thompson. The coroner's jury brought in a verdict of accidental death.

Percy J. Redsell, aged 33, British, a married man with no children, was instantly killed in a transportation accident at the smelter of the Mond division of the International Nickel Company, at Coniston. The accident occurred at about 2.30 a.m., July 6.

Redsell, at the time of his death, was employed as a fireman on a "dinkey" locomotive working in the smelter yards. He had been in the employ of the company for about five years and had had considerable experience as a locomotive fireman.

The regular train crew with the "dinkey" locomotive consisted of an engineer, a fireman and a brakeman. The latter acted in the capacity of trainman and conductor. The brakeman was responsible for directing the operations of the train.

Work on the morning of July 6 was evidently not progressing favourably and the train crew were behind. The blast furnaces were almost ready for slag pots and the cintering plant was signalling for an ore car. Mike Kirwan, the brakeman, had his locomotive pick up an ore car for the cintering plant and also a train of slag pots for the blast furnaces. He shoved the pots into the clear on the furnace track and switched the engine and ore car on to the cintering plant spur. The engine then stood between the ore car and the cintering plant thus in position for a drop (flying) switch. Previous to carrying out the above movements Kirwan had signified to A. Ethier, the engineer, his intention of making a drop switch. Ethier had consented to go ahead with it in order to

save time. Both men were well aware of the danger incurred in carrying out a drop switch, especially under conditions such as these, where the length of track in front of the switch was insufficient for the engine to attain any considerable speed.

The drop switch is carried out in the following manner: The engine gains speed toward the switch; at a suitable distance in front of the switch, and when the engine has gained sufficient speed, the engineer slows up suddenly, thus giving slack and enabling the fireman to pull the pin, thereby disconnecting the engine and the car. The engineer immediately speeds up the engine. When the engine has fully passed the switch, the brakeman closes it to the main line allowing the car to continue along the spur. In this particular case the engineer says he gave slack, heard the pin snap up, and immediately speeded up. The brakeman was also under the impression that the pin had been pulled and as soon as the back drivers of the engine passed the points he threw the switch. Evidently the pin had not been pulled, or at least the engine and the car were never definitely parted, as both the engine and the car were derailed and the tracks torn up. The switch was a right-hand switch, thus when the engine and the car stopped the right-hand front corner of the car was close to the right-hand back corner of the engine. Due to the derailment this distance was shortened to an unnatural degree. The fireman was caught at this point and sustained a fractured skull, which caused almost instant death.

In order to pull the pin, when the "dinkey" engine is being used, the fireman must stand on the footboard. The engineer was guilty of a breach of the trainmen's code in allowing this. Rule 37 states, in part, that no switching shall be carried out with any one riding the footboard. The brakeman was at fault in that he was aware of the danger involved and ordered the drop switch to be made.

Dr. Bennett was called immediately after the accident and on arrival found death to have been instantaneous.

An inquest was held at Coniston on July 10, before coroner Dr. G.A. Henry.

Quarries

Beachville White Lime Company

Antonio Nadalin, a hoistman, was killed by the falling mast of a derrick which was being dismantled at the quarry of the Beachville White Lime Company on January 10. He was an Italian, about 38 years of age, and leaves a widow and seven children. He had been employed at the quarry for about 18 years and during the past 8 years had been operating the derrick loading limestone into the kilns and cars.

A new steel derrick had been erected and the old one was being taken down. The parts had all been removed except the mast. This was being lowered by the new derrick with the hoist and wire cable blocks. The wooden mast, which had been in operation for fifteen years, was 85 feet long, 16 inches by 16 inches at the base and 14 inches by 14 inches at the top. It was made of two pieces of British Columbia fir, spliced and reinforced with steel plates at about the centre. A guy wire at each side prevented any movement sideways.

It had been lowered until the top was about twenty feet from the ground and was resting on the kiln to allow the guy wires to be adjusted. It was hoisted a few inches to swing clear of the kiln, when the timber broke suddenly about 35 feet from the top and both parts fell to the ground, the top part swinging in towards the foot of the new derrick.

Nadalin was operating the hoist about twenty-five feet away and evidently becoming confused when he heard the timber snap, ran directly under it. The top part, with the block attached, struck him in the lower part of the body and leg and he died in about half an hour. His left leg and hip were fractured and he had received serious internal injuries.

The mast broke about five inches above the reinforcing at the boom arm. The timber was apparently in good condition and was evidently broken by its own weight, as it was supported only at the ends.

An inquest was held by Dr. Cornish at Ingersoll on January 15.

Grenville Crushed Rock Company, Limited

Ronald McDonald, Canadian, single, aged 22 years, was almost instantly killed when struck by the dipper of a steam shovel about 2.30 p. m., May 29, at the quarry of the Grenville Crushed Rock Co., Ltd., Hawk Lake.

McDonald, who was employed as a brakeman on one of the quarry trains, was assisting in dumping a car of coal at the steam shovel when the accident happened.

The coal car, a six-cubic-yard dump car, had been dumped opposite the rear end of the steam shovel, after which it had been moved to a position about opposite the jack arm of the shovel for the purpose of righting it and to permit of cleaning the coal off the track where it had been dumped.

To right the car, the usual practice of having the weight of the shovel dipper placed on it, was followed. One of the door irons, however, became caught in some manner and thus prevented the car from coming into its upright position until McDonald, using a sledge hammer, succeeded in driving the obstructing iron free.

On freeing the car, McDonald stepped between the coal car and the adjacent car of the train while the coal car was being righted and fastened in position by other workmen. He was seen to step out again from between the cars, just as the shovel engineer was swinging the dipper back to the pit, and was struck in the chest by the dipper.

McDonald was immediately picked up and carried to the first aid room but died without regaining conciousness.

An inquest was held before Coroner J. A. Kinney, of Kenora, on May 31, when the following verdict was returned:—

"That the said Ronald McDonald came to his death on the afternoon of May 29, 1929, at Hawk Lake quarry, as a result of injuries received when he was struck by a swinging dipper or bucket of a derrick used for loading cars with broken rock.

It would appear from the evidence that the deceased for some reason, after the signal was given to swing the bucket, stepped in front of it. The view of the engineer operating the derrick was so obstructed by the boom and bucket of the crane that he could not possibly have seen the deceased, Ronald McDonald, and the said engineer was not to blame in any way for the accident.

Upon the evidence I find that the death of the deceased Ronald McDonald, was accidental and that no blame attaches to any of the workmen."

Walker Brothers

Norris Walker, aged 22 years, single, Canadian, was instantly killed on the fly wheel of an engine at the crushing plant of the quarry near Thorold on June 3. He was the son of David Walker, the owner of the quarry, and had been assisting his father in superintending the operation of the plant for about 18 months.

A new crushing plant had been completed and an engine installed for driving the crusher, elevators and screens from a drive shaft. The fly wheel was 12 feet in diameter and had a 20-inch face and carried a 20-inch belt. The lower part of the wheel runs in a pit three feet deep.

There were no witnesses to the accident. The engineer had left the building for two or three minutes and, as he was leaving, had seen Walker enter. He had probably gone in to see how the new engine was running.

The engineer, on returning, saw Walker's body thrown to the floor opposite the face of the wheel. He had evidently fallen against the face of the wheel and had been thrown to the floor with sufficient force to crush the skull.

An inquest was held at Thorold on June 20 by Dr. Herod.

Sand and Gravel Pits

Consolidated Sand and Gravel Company

Wallace Neustead, Canadian, aged 57 years, married, with a wife and a family of nine children, all grown up, was instantly killed when struck by a backing locomotive in the pit of the Consolidated Sand and Gravel Company, Paris, Ontario, about 8 a.m., on May 4.

Neustead was employed as a labourer at the pit and along with another workman, Tincknell, had been unloading railway ties from a box car on one of the pit sidings on the morning of the accident. About 10 minutes before being struck down Neustead had left the car in which he was working and was apparently returning to his work when run down by the locomotive. The fireman on a steam shovel working nearby saw the deceased walking along in the centre of the track but did not see the locomotive approaching.

The locomotive engineer stated in his evidence at the inquest that he had not seen the deceased on the tracks but presumed he must have stepped out on to the track from behind a coal pile which obstructed his (the engineer's) view.

The locomotive was backing at the time and the first intimation of the accident was had after the entire length of the engine had passed over the body and it was noticed by the brakeman who was riding on the front footboard. Life was extinct when the body was picked up.

An inquest was held at Paris, May 9, before Coroner J. A. Logie, M.D., the jury returning a verdict of accidental death.

H. Ellwood's Pit

Ernest Scidmore, aged 42 years, British, was fatally injured by falling material in a gravel pit owned by H. Ellwood, on June 24, and died in the hospital at St. Thomas on June 26.

The pit is located on lot 6, concession VII., Yarmouth township, Elgin county. The banks were about ten feet high.

Scidmore was loading gravel at the back of his truck, which was about three feet from the bank, when the upper part of the bank fell and crushed his head against the end of the truck.

The bank was evidently almost vertical at this point and had about one foot of earth on top of the gravel. The overburden had been removed from part of the surface of the pit, but at the part where the accident happened the gravel had been taken away to the edge of the stripping.

An inquest was held at St. Thomas on June 29 by Dr. D. L. Ewin.

M. M. Griswold's Pit

Robert Kirkpatrick, a labourer, was killed in a gravel pit on a farm owned by M. M. Griswold on September 17. He was 43 years of age, married, and had been employed on this farm since coming from Ireland five months previous to the accident.

The pit is located on lot 12, concession VIII., East Oxford township, Oxford county. It was about six feet in depth and material had been taken from it only for use on the property.

Griswold and Kirkpatrick had been hauling gravel at intervals with a small truck. The truck had been backed into the pit to within about three feet of the bank and both men were loading. Kirkpatrick had been digging from the floor of the pit directly behind the left back wheel. He had excavated a hole about two feet deep when the wheel slipped into the hole and his body was caught between the corner of the platform of the truck and the bank.

Griswold immediately called for help and released Kirkpatrick by digging away the gravel, but he was dead when this was accomplished. His chest was badly crushed.

An inquest was held at Burgessville by Dr. Green on September 23.

Firman Howell's Pit

John Canzoni was killed on July 9 by a fall of gravel in a pit owned by Firman Howell, in Brant county.

He was eighteen years of age, unmarried, and was employed on his father's farm about two miles from the gravel pit.

The pit is located near the highway and small quantities of gravel were occasionally taken from it by the farmers in the vicinity.

There were no witnesses to the accident. Canzoni had left home in the morning and was found buried beneath the material near the wagon at five o'clock in the afternoon.

Coroner Dinniwell, of Cainsville, was notified, but an inquest was not held.

Innerkip Lime and Stone Company

A. W. Martin, Canadian, single, 32 years of age, was instantly killed on May 17 at the crushing plant of the Innerkip Lime and Stone Company at Guelph.

Martin was a mechanic and had been employed at the plant for about one year.

He was caught by a belt-driven shaft supplied with power by a 75 h.p. motor. The shaft runs parallel to one side of a storage bin and carries three pulleys, two of which operate the crusher and screens. The distance between the pulleys and the bin was about three feet.

Martin had gone between the shaft and the bin to apply belt dressing to one of the belts, when his coat was evidently caught by the shaft or coupling and his body revolved several times with the shaft.

There were no eye witnesses to the accident but another employee saw the body revolving and immediately stopped the machine.

Martin's right arm was pulled off at the shoulder, the left arm and both legs were broken, the head was badly crushed and other parts of the body injured.

The belt to which he was about to apply the dressing was almost vertical and he had been accustomed to stand on a bin of sand to put on the dressing. The bin was empty at the time of the accident and he evidently decided he could do it by going behind the shaft.

An inquest was held at Guelph on May 21, by Coroner Dr. Orton.

Lake Shore Mines, Limited

James Willis, aged 51 years, Canadian, single, was instantly killed at the Lake Shore gravel pit, Diamond Lake, on Dec. 12, at 8 a. m.

The day previous to the accident Willis went to his own shack, about a quarter of a mile away, and brought five sticks of old powder to the gravel pit and hung it up in the tool house, which was heated with a Quebec heater. It is impossible to determine the age of the powder, as the five sticks were all Willis had in his shack. Thorpe stated in his evidence that the powder was very dark on the outside.

At the time of the accident Willis was sitting behind the stove with three sticks in one hand and two in the other and both hands resting on his knees. There were three other men in the shack at the time. Willis was sitting about two minutes when the powder exploded.

An inquest was held at Kirkland Lake on Dec. 19. The jury returned a verdict of accidental death.

Northern Development Department

John Wear, aged 27 years, was instantly killed by a fall of frozen gravel in a pit at mile 278.25 on the Ferguson Highway. He leaves a wife and two children residing in England.

Wear was employed as a mucker at the time of the accident. Mr. Hooper, who was foreman, Wear and two other men were cleaning the bottom of the pit after the last team had loaded about 4 p.m., when the face of the pit broke down for a horizontal distance of 25 feet.

The face of the gravel pit in front of Wear was eight feet high and slightly overhanging. With very little warning the top broke and one block of frozen gravel, about one ton in weight, struck Wear and crushed him. The foreman, eight feet to his right, did not move and was not hurt, as the face of the pit at that point was five feet high. The two men on the other side of Wear both jumped clear. The face of the pit in front of them was about ten feet high but broke more slowly.

The foreman, when asked if they were trying to pull the face down by working at the base, and if this were the usual practice, said no, that they were cleaning the bottom before they blasted the face down from the top.

An inquest was held in North Bay on January 27.

Warren Bituminous Paving Company

Clarence Appleton was almost instantly killed by a falling storage bin at the plant of the Warren Bituminous Paving Company, at Cobourg, on October 31. He was a Canadian, 43 years of age, married, and had been employed by this company as a labourer since May, 1929.

The plant, which consisted of a gasoline shovel and a storage bin, was located on the shore of Lake Ontario.

The bin was 10 feet long, 8 feet wide and 10 feet high and would hold a maximum of about 15 tons of material. It was constructed of British Columbia

fir timbers, 8 inches by 8 inches, and rested on sleepers 10 inches by 10 inches. It had been constructed according to the specifications of several other bins in use by this company and had been in use for about one year in different places and had been dismantled for moving.

At the time of the accident it was standing on a gravel ridge on the shore and had been filled with gravel from the beach by the gasoline shovel.

A truck driver, who was about to back under the bin for a load, saw it start to fall, and shouted. He and the operator of the shovel, who were the only persons at the plant, found Appleton under the timbers and buried except for the head and shoulders.

They immediately telephoned to the fire department for assistance, which arrived in a few minutes. He was dead when released in about half an hour.

The bin contained about 12 tons of gravel at the time and had tipped over toward the north. The gravel had probably moved on that side beneath the sleepers.

An inquest was held on November 12 by Dr. G. M. Ferris, at Cobourg.