



Reports

Layland No. 3

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UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

MINE EXPLOSION

File No. D-529

Mine Layland No. 3 Location Layland, W. Va.

Company New River and Pocahontas Consolidated Coal Co. Mailing address _____

Date March 2, 1915 Time of day 8³⁰ a.m. _____ p.m. Mine working or idle working

Total employment 375 Underground _____ Shifts worked _____ Daily production (tons) 315,000 annual

Number men killed 115 Injured _____ In mine 148

1 killed on surface - 114 and injured
Number men escaped unassisted 12 Rescued 42 Barricaded _____

Type (gas or dust) Gas & Dust Ignition source Open Light Rock-dusted _____

Was breathing apparatus used yes - in recovery work Gas masks _____ Self-rescuers _____

Time required to reach explosion area 30-40 hours (30-4 hrs) - about 3 days to get to the affected area.

Classification (gassy or nongassy) Non-gassy prior to explosion Methane exhausted (24 hours) _____

Number of main fans 1 Quantity air per minute 68,000

Ventilation (continuous or split) split Face (line brattice or fans) _____

Mine openings Drifts Principal _____

Coalbed Five Creek Thickness 36 to 48" Volatile ratio _____ Roof Shale Floor clay

Mining system Room & Pillar Pillars extracted _____

Room support: Main entries _____ Intermediate _____ Section _____

Transportation: Main Elec. Locom Intermediate horses Section horses

Electricity (voltage ac or dc) Mine power plant Face _____ Portable lights open

Principal mining machinery (continuous miners, conventional, etc.) Pick mining

Was machinery permissible type _____ Was it permissible _____

Blasting and explosives: Coal Black Powder Grading or special use _____

Cause of explosion Open light ignited gas permeated by dust

Did explosion result in fire or were fires found _____

Point of origin Accumulation of gas at bottom of 4-man

Area affected Major portion of the mine

Was Bureau report made yes Author(s) J. A. Paul, D. J. Parker, H. D. Mason, W. S. German

If no Bureau report, what and by whom _____

Remarks _____

FINAL REPORT

on

EXPLOSION AT LAYLAND NO. 3 MINE

of

THE NEW RIVER AND POCAHONTAS CONSOLIDATED COAL COMPANY

LOCATED AT

LAYLAND, FAYETTE COUNTY, WEST VIRGINIA

MARCH 2, 1915.

-----:-----

By

J. W. PAUL, MINING ENGINEER,
H. D. MASON, JR., ASST. MINING ENGINEER,
D. J. PARKER, MINING ENGINEER,
W. J. GERMAN, FOREMAN MINER.

Pittsburgh, Pa.
May, 1915.

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Ravine below Layland Mines.



Car 8 enroute to Layland.

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FINAL REPORT

on

EXPLOSION AT LAYLAND NO. 3 MINE

by

J. W. PAUL - H. D. MASON, JR. - D. J. PARKER - W.J. GERMAN

INTRODUCTORY STATEMENT

At 8:30 a.m., Tuesday morning, March 2, 1915, an explosion occurred at the Layland No. 3 Mine, Layland, West Virginia, resulting in the death of 114 men inside the mine, and one man, the colored store porter, on the outside. Fifty-four men afterward escaped alive from the mine, seven coming out (from 4th Left off No. 3 Main) from two to five hours following the explosion; five more escaping unassisted, (from 9th Left off No. 3 Main) at 8:00 a.m. on the morning of March 6th; and the remaining 42 survivors were rescued an hour later from behind their barricades in 10th Left entry off No. 3 Main by rescue parties led by the State Mine Inspectors and employees of the Bureau of Mines. This made a total of one hundred and sixty-eight men inside the mine when the explosion occurred, 114 of whom were killed, and 54 escaped alive. *(Probably 44 miners died from suffocation.)* Abe Cooper, the colored store porter, was walking in front of and ~~100~~ 100 feet from the drift mouth when the explosive wave burst forth, hurling him against a post and killing him instantly.

The explosive wave came from the drift mouth of No. 3 Mine with

great force shaking the buildings for a radius of one-half mile and breaking scores of windows in the immediate vicinity. The masonry arch over the drift mouth was destroyed and inby cross timbers displaced, resulting in a heavy fall which almost blocked the drift mouth, and the removal of which required four days' time.

GENERAL INFORMATION

Location: The Layland No. 3 Mine is located ~~six~~⁸ miles from Quinnimont, W. Va. on a mountainous tributary of Laurel Creek, which empties into the New River at Quinnimont. Quinnimont is on the main line of the Chesapeake and Ohio Railway and from Quinnimont up the precipitous Laurel Creek ravine extends the Laurel Creek branch of the C. & O. Railway to Layland, a distance of six miles. The Layland mines, however, are two miles distant from the railway depot, and at an elevation of over 500 feet up the mountain side, a steep incline plane extending up to the mine tracks.

These motor haulage tracks extend around the mountain side for a distance of two miles and connect the three drift openings Nos. 1, 2 and 3, each being an independent operation, but all feeding onto the same tippie.

These openings are all in the Fire Creek or Quinnimont coal and are at an elevation of 2500 feet above sea level, and 1400 feet above the C. & O. Railway station at Quinnimont. With rugged, heavily timbered mountains on all sides, the location of the Layland camp is extremely wild, isolated and picturesque.

Ownership, Operators, etc. The Layland No. 1 Mine was originally opened up in 1901 by Captain Joe Beury, pioneer coal operator on the New River.

In 1906 the operation was acquired by the present operator, the New River and Pocahontas Consolidated Coal Company, and the No. 2 Mine was opened up, shortly followed by the No. 3 Mine.

The general offices of this Company are in Charleston, W. Va. and the personnel for the Layland operations is, as follows:

H. M. Bertolet, General Superintendent, Charleston, W. Va.

O. C. Knerr, Local Superintendent, Layland, W. Va.

L. J. Nahodile, General Mine Foreman, Layland, W. Va.

R. Y. Muir, Company Inspector, Berwind, W. Va.

G. S. Borden, Chief Engineer, Berwind, W. Va.

John McMillan (deceased) No. 3 Mine Foreman.

John Havard (deceased) No. 4 Mine Foreman.

The New River and Pocahontas Consolidated Coal Company conduct other large operations in West Virginia at Berwind, Minden, Jed and Canebrake; while in Pennsylvania, their extensive operations at Windber, Pa. are under the company name of the Berwind-White Coal Mining Company.

The annual output of the Layland mines for 1914 was 315,000 tons, and the average number of miners 375. The Layland camp is non-union.

GEOLOGY AND CHARACTER OF COAL.

The topography of the country surrounding Layland is extremely mountainous, rough and broken. The Fire Creek coal is opened at an elevation of 2500 feet by drift openings near the summits of the Quinnimont mountains above Laurel Creek, six miles east of the New River valley.

The Fire Creek, or Quinnimont semi-bituminous bed, is the lowest of

the three most valuable beds of the New River group, the other two being the Beckley and the Sewell. The Fire Creek seam is of the Upper Carboniferous system, the Pennsylvanian series, the Lower Pottsville formation and the New River group. The principal operations in the Fire Creek seam are along the C. and O. Railway in the New River district. It was the first bed to be mined along the New River, and for many years was the premier seam of the region; however, partial exhaustion has now relegated it to third place in production. It is a low volatile, semi-bituminous coal, of great commercial value as steam, bunker, domestic, or railway fuel.

Coal: At the Layland mines, the Fire Creek seam varies from thirty to forty-eight inches in thickness. On July 13, 1909, Layland Mines Nos. 1, 2 and 3 were sampled by J. J. Rutledge and J. W. Groves of the Bureau of Mines, as described below:

Lab. No. 8346 - Layland No. 1 Mine, face of Main Entry, 5000 feet east of drift mouth.

	Ft.	In.
Roof, Strong gray shale		
Coal	0	10
Mother coal	0	0-1/2
Coal	0	2
Gray band	0	2
Coal	2	1
* Shale	0	1-1/4
* Coal	0	3
Floor, Hard gray underclay		-----
Thickness of coal bed	3	7-3/4
Thickness of coal sampled	3	3-1/2

* Excluded from sample.

Laboratory No. 8234 - Layland No. 2 Mine, face of Main Entry,
5300 feet northeast of drift mouth.

Roof, Hard gray shale	Ft.	In.
Coal	3	7-3/4
Mother coal	0	0-1/2
Coal	0	5
Floor, Hard underclay	-----	
Thickness of coal bed	4	1-1/4

Laboratory No. 8350 - Layland No. 3 Mine, face of Main Entry,
2400 feet east of drift mouth.

Roof, Strong gray shale	Ft.	In.
* Coal and shale, thin layers	0	2
Coal	2	9-3/4
Mother coal	0	0-1/4
Coal	0	4
Floor, Hard underclay	-----	
Thickness of coal bed	3	4
Thickness of coal sampled	3	2

* Excluded from sample.

The analyses of these samples (coal as received) No. 8346, 8234
and 8350 are as follows:

Lab. No.	Moisture	Volatile	Fixed Carbon	Ash	Sulphur
8346	3.01	15.32	76.74	4.93	.80
8234	3.60	14.50	74.90	7.00	.80
8350	2.72	16.30	75.49	5.49	.66

Face samples and road dust samples were also secured by J. W. Paul

and D. J. Parker in No. 3 Mine on March 17 and 18, 1915, and the measurements and analyses follow:

Location of Coal Sample	Moisture		Volatile		Fixed Carbon		Ash		Sulphur	
	As rec'd	Mois- ture	As rec'd	Moist- ure	As rec'd	Moist- ure	As rec'd	Moist- ure	As rec'd	Moist- ure
		Free		Free		Free		Free		Free
Face of 10th Left off No. 3 Main	4.04	---	19.07	19.87	68.83	71.73	8.06	8.40	.76	.79
Face of No. 3 Main entry	2.70	---	19.64	20.18	71.64	73.63	6.02	6.19	.72	.74
Face of 6th Left off No. 4 Main..	2.92	---	20.62	21.24	70.03	72.14	6.43	6.62	1.09	1.12
Face of Main Tunnel	2.21	---	20.21	20.67	70.34	71.93	7.24	7.40	.74	.76
Face of 3rd Left off Tunnels	3.02	---	20.63	21.27	70.23	72.42	6.12	6.31	.89	.92

Thirteen road dust samples and two rib dust samples were also collected in No. 3 Mine and analyzed as follows:

Road Dust as received.

Location	Percentage:		Moisture	Volatile	Fixed	Ash	Sulphur
	thru 20 mesh screen	Carbon					
5th Left off No. 3 Main	38.5	10.11	16.85	60.50	12.54	.94	
Near 7th Left on No. 3 Main	78.7	5.32	9.14	31.54	54.00	.49	
3rd Crosscut, 7th Left off No. 3 Main ...	91.7	7.18	15.51	59.87	17.44	.86	
Room 10, 8th Left off No. 3 Main....	68.1	.98	18.68	65.35	14.99	.87	
Near 9th Left on No. 3 Main	77.7	10.56	14.32	50.43	24.69	.62	
Near Tunnels on No. 4 Main	82.1	2.33	15.85	55.80	26.02	.77	
Near Room 16, 4th Left, off No. 4 Main:	77.4	4.59	16.96	60.04	18.41	.77	
Near 5th Left on No. 4 Main	69.1	3.83	17.41	59.52	19.24	.83	

Location	:Percentage: : thru 20 :mesh screen	:Moisture:	:Volatile:	: Fixed : Carbon	: Ash	: Sulphur
Near 5th Left on No. 4 Main	69.2	1.14	17.27	59.04	22.55	.82
Near 7th Left on No. 4 Main Aircourse...	85.7	5.05	18.46	65.00	11.49	.85
Near No. 4 Main on Main Tunnel	69.9	6.15	18.54	60.77	14.54	.75
3rd Left off Tunnels:	88.7	11.66	12.79	48.01	27.54	.77
Near Face of Main Tunnel	66.2	3.07	16.91	70.19	9.83	.88
Rib Dust on Sub- Station	98.6	2.86	15.52	57.30	24.32	.76
Rib dust, 5th Left off No. 4 Main	90.5	7.85	15.64	63.02	13.49	.93

(Road dust samples from adjacent mines)

Hemlock Hollow Mine : Main entry	38.0	2.72	17.51	60.35	19.42	.75
Hemlock Hollow Mine : Main entry	31.7	2.74	15.82	53.44	28.00	.71
Greenwood Mine, Main: Entry	36.1	2.39	16.70	55.83	25.08	.63
Greenwood Mine, Main: Entry	32.6	3.54	20.43	59.60	16.43	.64

Inflammability Tests:

Inflammability tests on a large scale

on Layland dust will be conducted within a few months at the Experimental mine, Bruceton, Pa., and the results obtained will follow in a supplemental report.

Roof: The top is generally a hard, gray shale, rather variable and containing numerous "slips", which render it dangerous to the miner. It requires close attention and systematic posting. Two feet of top is "brushed" in haulage-ways but not in rooms.

Timbering: Other than a few dozen of heavy cross timbers on No. 3 Main haulage-way, near the drift-mouth, there were no timbers used in the main entries. On the side entries props were used where gob was stored, requiring the widening of the entries, but no cross timbering was done. In the rooms systematic timbering was in evidence throughout the mine. The Company owns its own timber lands and saw-mill.

Cover: The thickness of the "cover" over No. 3 Mine ranges from 20 feet, near the outcrop, to 500 feet where the advance workings are a mile and a half in the mountain.

Floor: The pavement is mainly made up of a hard underclay, which makes a smooth bottom, and does not mix with the coal in loading.

Moisture: The workings seemed damp in many places and there was considerable standing water at the faces. The mine seems to be naturally rather moist and few places were found unusually dry and dusty.

Gas: The mine was generally considered as non-gaseous and no fire bosses were employed. Inspector Absolom testified at the inquest that he had never found "explosive" gas in the No. 3 Mine. However, Mine Foreman Nahodile testified that he had known gas to be "liberated" in small quantities in No. 3 Mine for over a year.

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Night Foreman Frank Wallen testified that he had found gas in 12th Left off No. 3 Main and could light the gas "bubbling from the water". Also he had found gas in 8th Left off No. 4 Main Entry; but he did not consider any of this gas dangerous with proper ventilation; and to his knowledge no employee had ever been burned with gas; but he claimed that Mine Foreman McMillan (deceased) had neglected his work by not placing trappers at the ventilating doors, which might result in gas accumulating.

Hugh J. McMillan, one of the 42 men who escaped from 10th Left, testified that he had found gas in the 12th Left off No. 3 Main, but "very little", and he always considered the ventilation good.

Earl Aurentz testified that he had worked in the 5th, 6th, 7th, 8th and 10th Lefts off No. 3 Main and had never seen gas. He had never worked in a mine that made gas. The motormen were often careless in leaving trap-doors open and he had heard some miners complain of insufficient ventilation. At one time a door had been broken down near his entry and when he asked the foreman when it would be repaired, the foreman answered, "When we get damn good and ready".

R. Y. Muir, Company Inspector, testified that he had at one time detected gas at the face of No. 3 Main heading but only by boring a hole in the coal. He had inspected the mine on February 26, 1915, (4 days prior to the explosion) and found all working conditions safe.

Note: It might be well commented upon at this point that R. Y. Muir is not only a mining man of wide experience, but one of the most thorough, fearless, and conscientious inspectors to be found in any field. These facts are well known to the writers of this report.

Mine Superintendent O. C. Knerr testified that over a year previously he had found gas in No. 11 Left off No. 3 Main, but that no bodies of standing gas had ever been detected, and he had never known State Inspector Absalom to find gas during his inspections. Knerr believed that no gas would be found in No. 3 Mine if the mine was closed for a week and the fan stopped. (This seems rather a broad statement.) The West Virginia State Mining Reports for ten years back do not show that any miner has been burned by gas in the Layland mines.

During the investigations made in Layland No. 3 Mine on March 16, 17 and 18, 1915 by J. W. Paul, D. J. Parker, H. D. Jones and R. H. Seip, mine air samples were collected in No. 3 Mine and one sample in No. 2 Mine, which analyzed as follows:

Lab. No.	Entry	Volume of Air	CO ₂	O ₂	CO	CH ₄
5998	Main Return No. 3 Mine.	90,288	.08	20.80	.00	.05
5994	Main Return No. 2 Mine.	40,000	.09	20.88	.00	.01
5986	7th Left off No. 3 Main.	9,000	.10	20.61	.00	.20
5992	Room 9, 10th Left off No. 3 Main.	Still air	.15	20.61	.00	.08
5988	4th Left No. 20 room off No. 4 Main.	Still air	.14	20.70	Trace	.12
5984	Face of 6th left off No. 4 Main	Still air	.03	20.73	.00	.06
5996	Face of Main tunnel.	Still air	.04	20.90	.00	.00

Lab No.	Entry	Volume of Air.	CO ₂	O ₂	CO	CH ₄
5991	Face of room : 4 off 3rd Left : off Tunnels.	Still air :	.23	20.37	Trace	.12
5990	Face of 4th : Left Aircourse : off Tunnels.	Still air :	.16	20.68	Trace	.06
5997	Face of 2k : 5th Left off : Tunnels.	Still air :	.19	20.66	Trace	.10

Although ventilation had been restored when the above samples were collected some traces of "afterdamp" remained at the faces, notably in 4th Left off No. 4 Main and 3rd, 4th and 5th Lefts off Tunnels. Small percentages of methane are also found in all samples and under certain conditions dangerous accumulations of gas would seem possible in No. 3 Mine.

DESCRIPTION OF MINE AND METHOD OF OPERATION.

Development and System of Working: Layland No. 3 Mine is a drift opening, the main triple entries being driven to the rise on the strike of the measures at a bearing of North 80 degrees East and are advanced a distance of 7300 feet (see map). Twelve pairs of double butt entries are driven off at intervals of 500 feet to the left at right angles from these Main entries, and rooms are driven on 50-foot centers to the left off these Left entries. This constitutes what is known as the No. 3 Mine.

Seven hundred feet from the drift mouth, the so-called Tunnel entries are driven off to the left of the Main entries. These Tunnel entries are advanced for a distance of 5700 feet and off them are turned five pairs of Left entries. Twenty-two hundred feet inby off the Tunnel entries are turned off the No. 4 Main entries, at the same bearing as the No. 3 Main entries, N. 80° E., and these No. 4 Main entries are advanced for a distance of 3900 feet with eight pairs of Left entries turned off at right angles, constituting what is known as the No. 4 Mine.

Twenty-one hundred feet beyond the No. 4 Main entries inby on the Tunnel entries are turned off the No. 5 Main entries (see map) which are known as No. 5 Mine.

From this description it may be readily noted that although these Main entries, Nos. 3, 4 and 5 and their adjoining butts, are known as No. 3, No. 4 and No. 5 Mines they may be altogether rightfully considered as one mine, as the No. 3 Mains have the only openings to the outside (see map).

The triple entry system has been employed to some extent on the Main entries, but on the side entries the double-entry room and pillar system is used, exclusively, and the rooms are only turned off the haulage-ways. Pillars have been drawn over large areas with good results. The breaking through of rooms onto the adjoining panel was again proved to be bad practice, as this permitted the explosive wave to reach portions of the mine, which would otherwise have been undisturbed. No. 6 Left entry off No. 3 Main is also broken through onto No. 4 Main (see map), and

although this opening was sealed by a masonry stopping, the explosion forces broke through and traveled across from No. 4 to No. 3 Mine, thus killing many men, who might have otherwise escaped.

To the right of No. 3 Mine is the No. 2 Mine, an entirely separate operation, but as shown on the accompanying mine map some of the abandoned rooms off 1st Right off No. 3 Main were broken through to rooms off an entry from No. 2 Mine. Although these openings were bratticed up, the explosive forces blew out these stoppings partially, which permitted the fresh air current from No. 2 Mine (ventilated by a force fan) to leak through upon No. 3 Main entries, which seemed a Providential circumstance, as it played a very important part in the saving of 47 lives on March 6th, four days after the explosion occurred. Further on in this report a detailed account will be given covering the fortunate escape of these men.

Mining: The coal is all mined by pick, an "over-cutting" being made in the top coal, and then blasted down. Naturally with this system of mining there was always ~~none or less~~ ^{liability of} shooting "off the solid".

Explosives: The explosive used was Dupont FFF black powder. From observations made in the mine, coal dust and bottom dirt were used for "tamping", as there was no clay to be seen inside the mine for this purpose. No shot firers were employed and the miners fired their own shots at any convenient time during working hours.

Electric Equipment: Near No. 3 Mine in large stone buildings is located the central power plant for the three mines Nos. 1, 2, and 3.

The current (A.C.) is here generated at 6300 volts and transformed down to 300 voltage D.C. for use within the mines. All three fans are electrically driven, also the mine pumps; as well as all the main haulage and gathering motors, a total of 21 electric locomotives being used in the three mines and on the two-mile outside motor haul. Nine electric haulage motors were employed in No. 3 mine.

Haulage: All haulage in No. 3 Mine was performed by nine electric locomotives voltage 300. No mules at all were used, and after the explosion had caused the heavy fall blocking No. 3 drift mouth, two mules were brought from a distance to expedite the work of cleaning up this fall. The recovery work following the explosion proceeded more rapidly owing to the fact that no dead mules blocked the haulage ways. It will be remembered that following the Eccles, W. Va. mine explosion, 17 dead mules caused considerable trouble and annoyance, the same being true at the Dawson, New Mexico disaster, where 19 mules were killed.

No. 3 and No. 4 Main entries are practically level although slightly against loads, and throughout the mine no very severe grades were in evidence, *except in the 4th and 5th Lefts off the Tunnel Entries.* although the Left entries off No. 3 and No. 4 Mains are driven to a rise of 2 to 3 per cent.

Lighting: Open lights were used exclusively by the miners and officials in No. 3 Mine. Carbide lamps were principally used by the miners with a small percentage of oil lamps, both varieties were found during the recovery work following the explosion.

Electric lights were strung along the main haulage ways, but of course **these** could not be utilized after the explosion, as all inside power was cut off.

Protection of Electric Wires: The trolley wire is protected by wooden shields at all crossings and turnouts, and as the top is "brushed" for an average height of six feet on haulage-ways, the danger from the electric current does not seem imminent. Notwithstanding these precautions it is noted from the last (1913) Annual Report of the West Virginia Department of Mines that two men were killed in No. 3 Mine during that year by coming in contact with the trolley wire.

Ventilation: The ventilating current for No. 3 Mine is produced by a 6' x 18' Capell steel fan driven by chain from an electric motor, and operating, previous to the explosion, as a blowing fan. The average speed maintained was 70 revolutions per minute producing sixty-five to seventy thousand cubic feet of air per minute. State Mine Inspector Absalom testified that on his last inspection of Layland No. 3 Mine, January 19, 1915, the fan was producing 65,000 cubic feet and running at 70 revolutions. This fan is well housed in a fire-proof masonry structure.

There were three splits in the air current previous to the explosion. The main "intake" air current travels from the fan in by the Main No. 3 Aircourse into the point where the Tunnel entries turn off to the left. At an overcast at this point the air splits, one current

traveling into the Tunnel Aircourse. At the overcasts 2200 feet inby the Tunnel entries this current again splits, one portion passing into the No. 4 Main Aircourse, and the other portion traveling inby the Tunnel Aircourse.

From this description it will be noted that No. 3 Mine, No. 4 Mine and the section off the Tunnel entries (see map) are each ventilated by a separate air current. The destruction of these three overcasts by the explosion deranged this system of ventilation and temporary stoppings had to be constructed as the recovery work advanced.

Overcasts, Brattices and Doors: All overcasts were well constructed of reinforced concrete held by I beams and T rails embedded in the top and ribs.

The stoppings on main entries were principally constructed of concrete and masonry, and on side entries and in rooms of wood and gob material.

Wooden doors were employed on the Main entries to conduct the ventilating current into the side entries. No trapper boys were employed to attend these doors, as noted from the testimony of Night Foreman Frank Wallen at the inquest, and it was a common occurrence for the motormen to ^{neglect} ~~forget~~ to close doors when passing out with their trips.

Humidity: During the investigations in the mine following the explosion many wet sections were found, also much standing water. Also numerous dry sections were found and some accumulations of dry coal dust.

Night Foreman Wallen testified that he had not found the Main

Haulageways very dry and dusty, but that he had found dust accumulations on the Tunnel Haulageway near the sub-station (see map) and for some distance outby. Upon instructions he had watered this dust; (no date given) so that the dangers of dry dust accumulations were very evidently recognized by the mine officials.

State Inspector Absalom testified that the mine was damp and the coal dust generally damp as found on his inspection of January 19, 1915, although at some of the faces he had found some "live dust".

From all that could be learned no regular system of sprinkling the haulageways nor humidifying the air current was employed.

Drainage: Water wagons were used to remove the water from the working faces, also an electric pump. Although water was found in many portions of the mine, especially at working faces, the only large accumulation was in 6th Left entry off No. 3 Main entry. The 6th Left had been worked out and abandoned and contained a large body of standing water. This proved a fortunate circumstance tending to cool and retard the explosive wave as it passed from No. 4 Main across the 6th Left to No. 3 Main entry (see map).

Fire Protection: There was no fire protection inside the mines excepting water-^{barrels}~~barriers~~. Fire extinguishers were provided for the power plant buildings and store-room on the outside. The Fire Creek coal is not easily fired and no mine fires have ever been reported from the Layland mines.

Local Conditions: The weather conditions apparently had little

to do with the explosion. March 2, 1915 was fair and cool and there had been no sudden barometric changes. The miners had gone into No. 3 Mine at seven o'clock that morning, 168 men all told; and nothing out of the ordinary had been noted, until the explosion occurred about 8:30 a.m. Mine Foreman McMillan and Havard had gone into the mine, but General Mine Foreman Nahodile and Superintendent Knerr were still on the outside. Mine No. 2, adjoining No. 3, was working, as was also No. 1 Mine.

Features of Special Interest: This explosion is of special interest for several reasons, namely:

Firstly: This is the first explosion in the Fire Creek seam on the North east side of the New River. On March 18 and 19, 1905, explosions occurred in the Rush Run and Red Ash Mines, (operating the Fire Creek seam) located at Rush Run, Fayette County, West Virginia on the south side of the New River. Twenty-four lives were lost in these two explosions, which were investigated at that time by Chief Mine Inspector J. W. Paul. These mines are about 10 miles from Layland and are both drift openings high up on the mountainside above the New River.

Secondly: The Layland mines were considered practically non-gaseous by all experienced and capable mining men in that district. Being at an elevation of 2500 feet and so far above water level, it seemed improbable that dangerous gas accumulations would occur. Also the ventilation provided seemed more than ample.

Thirdly: Several sections of No. 3 Mine were not disturbed at all by the explosion, while in several other sections there was evidence of great violence.

Fourthly: Seven men escaped alive several hours after the explosion; while four days later five men came out unassisted from 9th Left entry where they had bratticed themselves off, shortly after which 42 men were found by rescue parties bratticed off in the 10th Left, and conducted safely to the outside. This total of 54 men who escaped is the largest on record in the mining annals of this country.

Fifthly: The splendid brattice work accomplished by these parties in 9th and 10th Left entries, also their cool headed and courageous conduct in the face of danger and death is worthy of the highest praise. A detailed description of their accomplishments is of real value to the mining industry.

Sixthly: The peculiar chain of circumstances, which first blocked off the explosive wave and "afterdamp" from the sections of the mine in which these men barricaded themselves, and which secondly permitted the leakage of a fresh air current from No. 2 Mine upon No. 3 Main entry, thus establishing a breathable atmosphere through which these 47 men could escape; all seemed almost Providential in their occurrence.

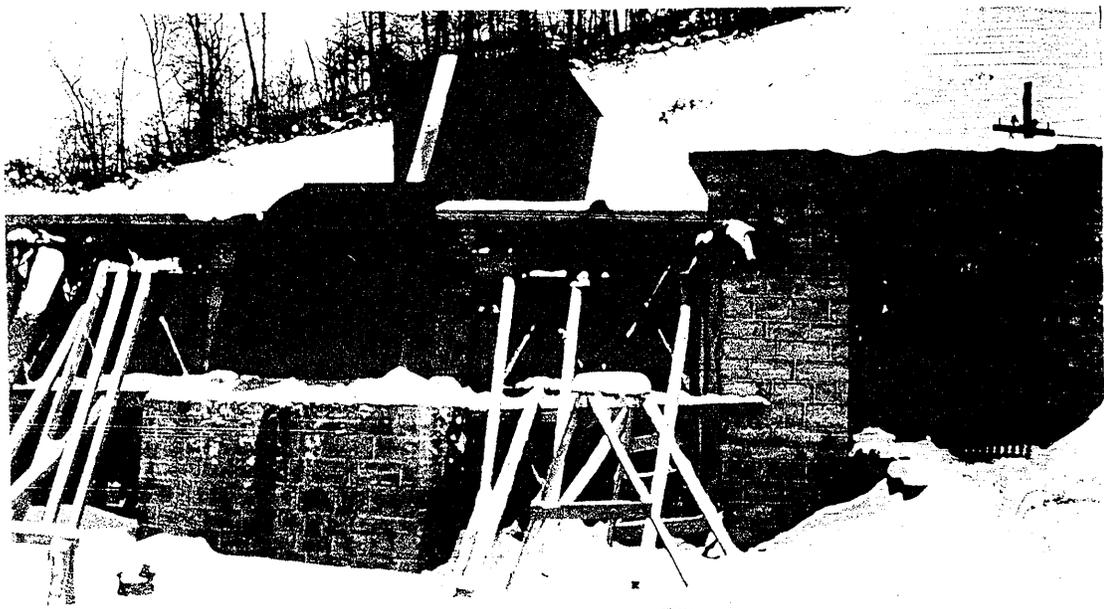


Crowd near morgue
March 3, 1915.

Far →



Drift mouth No 3 Mine
March 3, 1915.



Far house No 3 Mine, March 9, 1915.

STORY OF THE EXPLOSION.

At 8:30 a.m. March 2, 1915, the explosion burst from the drift mouth of No. 3 Mine with great violence killing the colored store porter, Abe Cooper, who was passing outside about ~~100~~ feet from the drift mouth.

General Mine Foreman Nahodile was about ~~100~~⁵⁰ feet distant from the pit-mouth but off to the left at the Mine Foreman's office, and although knocked down by the explosive force, was not injured. The loud report and heavy concussion made by the explosion was heard all through the camp also by the men in No. 2 Mine and crowds of people soon gathered at the pit mouth. No. 3 drift mouth caved in as a result of the explosion, but the force was not so strong coming out the air course, consequently the fan was not badly damaged and few repairs were necessary to restore the operation of the fan.

The testimony follows of three officials who were on the outside when the explosion occurred:

General Mine Foreman L. J. Nahodile testified "that he was at the drift mouth at 7:00 a.m. on the morning of March 2nd and saw all the miners entering as usual. At 8:30, when the explosion occurred, he was standing at the mine foreman's office ~~100~~⁵⁰ feet ^{and} to the left of the drift mouth and he was knocked over by the force. As he fell he saw No. 3 drift mouth falling in, and saw clouds of smoke bursting out, but no flame. He ran to the fan and found the fan stopped and the doors blown away, then walked to No. 3 drift mouth and saw that the heavy smoke had ceased coming out. A number of

women came to him and begged him to save their husbands, then Supt. Knerr arrived and he asked Mr. Knerr to start the fan. He then asked for volunteers to enter the mine and only one man responded, and he and this man went into the mine with brattice cloth and covered the overcast at the junction of No. 3 Main aircourse with the Tunnel entries (see map)."

"After that the fan was started and he tried to advance the ventilation, about that time he saw four men coming out No. 3 Main aircourse and he yelled to them to hurry as there was an explosion." (No time given by Foreman Nahodile. These were the four Polish miners from 4th Left led by Jake Solok, who escaped some time after the explosion. Their story will be included ~~later~~ later on in this report.)

Mine Superintendent Oscar Knerr testified "that he was near his home on Tuesday morning, March 2, 1915, about 8:25 a.m., when he heard a report and felt a concussion that seemed to shake every house in the camp. He ran to the mine and saw black smoke coming out of the No. 3 drift mouth, and saw that the drift mouth had fallen in, also that the fan was stopped. He and Nahodile got some men and they patched up the doors on the fan house and got the fan started. They then went in the No. 3 aircourse and later met four men coming out."

The store-room keeper told H. D. Mason, Jr. "that when the explosion occurred, he was sitting in the store-room (about 1000 feet from No. 3 drift mouth) when he felt a queer concussion, shaking the entire building, and then a loud report. He ran to the mine and saw volumes of thick black smoke pouring out of No. 3 drift mouth and everybody in camp

came running to the mine and there was great excitement and confusion. He did not wait long but returned to the store-room and sometime afterwards he was told that some men had come out of the mines alive." (No time given.)

Seven men escaped from the mine, (4th Left and elsewhere) some time after the explosion occurred; Jack Vasilefsky, Ben McDaniel, Jr. (carried out by Jack Vasilefsky), Charles Koronosky, Christo Janos, Stanley Molokas, Jake Solok and Mike Solok.

Statement of Jack Vasilefsky to Dr. W. A. Lynott: "I am miner in Layland No. 3 and 39 years old. According to my watch, the explosion occurred at 8:30, as just about that time I looked at my watch. I was in No. 15 room on 4th Left entry off No. 3 Main. I heard a big shot and in an instant some dust and wind struck me and my light went out. I went back several feet to my coat and found some matches and relighted my lamp. This time the light remained burning. After five or six minutes the dust and smoke disappeared. Then I got a pain in my head and some noise in my ears, and I then knew it was an explosion. I did not want to go outside right away, fearing falls of slate and a second explosion. It again became hot and smoky. I stayed in my room two hours and twenty minutes.

However, about fifteen minutes after the loud report I began digging coal again in my room but later on smoke came in, which smelled like grease, it made my breast tight and my legs and arms shook. I called to my "butty", Charles Koronosky, who was about 100 feet from me on the

left rib and told him to come on home, as there was a big explosion. He started out then and I followed him out to the door leading to No. 3 Main entry. I pushed on the door and found a car filled with slate pushed up against the door crossways. The door was cracked but not broken. We crawled over the car onto the 3rd Main motor road and walked out to the 2nd Left, (they had traveled over 1500 feet) where we found two men lying, one dead and one alive, (Ben McDaniel, Jr.) so I picked this man up and carried him for a long distance, when some one ahead yelled, "who's there?" I answered and Supt. ~~Kneer~~ Kneer yelled back, "Come on out here". (This meeting was at a point on the No. 3 Main aircourse midway between the Tunnel entries and 1st Left, or about 1000 feet from the fan. As the fan had been started there was a fairly strong fresh air current at this point.)

"Supt. Kneer was about 400 feet from us, so I laid down the man I was carrying and went forward to Mr. Kneer. He told me to go on outside, but I told him I had left a man back there still breathing and I wanted to get him out. Supt. Kneer sent a man with me and we went back and got McDaniel and carried him out to fresh air. We rubbed him and in about 20 minutes he opened his eyes. Mr. Kneer then went outside to get stretchers and help and we stayed with McDaniel. Mr. Kneer came back, and I told him about the other man back along the tracks and asked him if I could go to him. He agreed and with my "butty" and Mr. Kneer we went back and found the man dead, so we left him there. By this time I was feeling pretty sick, so Mr. Kneer ordered me out of the mine, so

my "butty", McDaniels and myself went outside and to our homes."

(Note: The splendid courage of this Polish miner in saving McDaniel and then trying to save another life is worthy of highest praise.)

Statement of Jake Solok to W. A. Lynott. "I am a miner in No. 3 Layland, 31 years old, married and of Polish nationality. I worked in No. 20 room, 4th Left off No. 3 Main and about 8:30 in the morning I was inside room 20 with three other men, Mike Solok, Stanley Molokas and Christo Janos. We heard a noise and all our lights went out. Dust and smoke came fast along the entry and a little smoke came into room 20. I thought a fall was coming. We all four talked about it and wondered what was wrong. Then three American men came to our room and I told them it must be an explosion, but they said it was not an explosion but a big fall. All four of us they stayed in room 20, we started to work and loaded four cars. Then there was still smoke in our room and on the entry and we started for the outside. We hurried out to the door at No. 3 Main and found hot smoke on Main, so we shut the door again, and started for the outside, on No. 3 Main Aircourse, where the air seemed better."

"After going some distance we all got very hot and felt tight in the chest, and we stopped and rested where there was water about two feet deep, which cooled us off. In a few minutes we felt better and went along the aircourse towards the outside. Soon we meet the mine boss and another man, who told us where to go, and we got outside safely."

(Same statement made by other three men of party.)

It appears from these statements that Jake Solok and his three Polish comrades from room 20 on 4th Left escaped first out the Main Air-course meeting Foreman Nahodile near the wrecked overcast. The second party to escape, Jack Vasilefsky and Charles Koronosky, from room 15 on 4th Left, also rescued Ben McDaniel, Jr., who was lying near the 1st Left on their way out. Apparently these two parties did not see anything of each other, although the men worked on the same entry.

The three Americans, who Jake Solok mentions in his statement as discussing with his party at room 20 whether or not an explosion had occurred, these men passed on out of 4th Left and were overcome by the "afterdamp" out on the Main entries. The fact that these Polish miners all remained in their rooms for some time to load coal accounts for their escape, as after some time had elapsed, the fan had been started and there was sufficient air along the Main entries to permit their escape.

That there were other men alive further in by on the No. 3 Main entries was not suspected by these seven men who so fortunately escaped the first day. This will conclude the "Story of the Explosion" and of the events which occurred soon afterward. The detailed description of the rescue and recovery work is given further on in this report.

Alleged Causes: It was generally believed during the recovery work at the mine that a local gas explosion propagated by coal dust had been the cause. Some indications of gas were found during the recovery work at the faces of the 4th and 5th Lefts off the Tunnel entries, also

in No. 4 Mine, but no large body of gas was encountered. Following the investigations of March 15 and 16 by Chief Inspector Henry and his district inspectors Absalom, Holliday, Lambert, Cobb and Murray, all six inspectors testified at the inquest that from the evidence obtained they believed that the point of origin of the explosion was near the head of 3rd Left entry off the Tunnels, (See sketch) where there had been a "blown through" shot. The rib between the 3rd Left entry and Air course had narrowed at this point to 4-1/2 feet in thickness. A drill hole had been made near the bottom at this point from the aircourse side and loaded with black powder or dynamite. When this shot was fired, it "blew through" into the entry side, owing to the thinness of the pillar; and in the opinion of the Inspectors, the flame from this "blown-through" shot was sufficient to ignite coal dust in adjacent workings, thus propagating the explosion through the mine. At a point in the air course, near this drill hole, were found bodies 16 and 17, both badly burned and the latter with the head almost severed from the body. Considerable coked dust was also found on these 3rd Left entries, although the faces of both entries contained standing ~~gas~~ water over 12 inches deep, (May 15 and 16, thirteen days after the explosion) and other portions of the entries were in a damp condition. According to this decision gas played no part whatever in the explosion.

General Superintendent Bertolet, Mine Supt. Knerr, Mine Foreman Nahodile and Company Inspector Muir all agreed with the State inspectors in this finding concerning the origin and cause of the explosion.

Coroner's Verdict: The coroner's inquest was held in the Assembly Hall at Layland, W. Va., beginning Wednesday morning, March 17, 1915. The hearing was conducted by Squire B. S. Hastings of Montgomery, W. Va. and the jurors were J. E. Lowe, O. D. Amick, A. Absalom, J. A. Higginbottom and H. W. Claypool. C. R. Summerfield, Prosecuting Attorney of Fayette County, conducted the case for the Commonwealth, and C. W. Dillon, attorney, appeared in the interests of the New River and Pocahontas Consolidated Coal Company.

The inquest started at 9:55 a.m. and Attorney Summerfield opened the hearing by saying that the Layland Mine was considered the best mine in the New River field, and it was the last mine in West Virginia where an explosion had been expected, and for that reason he thought it best to ascertain in detail the true conditions, as this would prove beneficial in the future to all operators and miners.

Attorney Dillon for the company stated that a comprehensive investigation was desired as the company had nothing to conceal.

Chief Mine Inspector Earl Henry interrogated every witness and did most of the questioning. The following eight company officials were called as witnesses,

H. M. Bertolet, General Superintendent.
G. S. Borden, Chief Mining Engineer.
Oscar Knerr, Mine Superintendent.
L. J. Fahodile, Mine Foreman.
Frank Wallen, Night Foreman.
R. Y. Muir, Company Inspector.
Dr. Smith, Mine Surgeon.
John Clapperton, Mine Superintendent from Minden Mines.

The following five State Mine Inspectors were called as witnesses:

J. I. Absalom	-	L. B. Holliday
R. B. Cobb	-	E. C. Lambert

Isaac Murray.

The following two volunteer rescuers, who worked with the Mine Inspectors were called:

G. W. Workman
William St. Clair.

The following eight miners were called upon:

Salvitore Marici, who escaped from 9th Left.			
John Whalen,	"	"	10th "
John Fitzpatrick	"	"	10th "
Frank Jenoni	"	"	10th "
Hugh J. McMillan	"	"	10th "
George Parker	"	"	10th "
Earl Aurentz, who had worked in No. 3 mine.			
C. W. Higginbottom	"	"	"

This comprised the entire list of witnesses. The inquest lasted until midnight, when the jury retired and brought in their verdict in accordance with the testimony rendered.

The Coroner's jury found that the explosion had been caused by a "blown out" shot near the face of the 3rd Left off the Main Tunnels, resulting in the death of 115 men.

The Workman's Compensation fund of West Virginia will provide for all the widows, orphans and dependents of the men killed by the explosion. The widows receive \$20.00 per month and \$5.00 per month for each child under 15 years of age.

THE RESCUE AND RECOVERY WORK.

Notification of Various Officials: Chief Henry and District Inspectors Absalom and Holliday were notified by telephone. General manager H. M. Bertolet was at Hinton, W. Va. on his way to Charleston, W. Va. when he received word of the explosion and he proceeded to Layland following at once, arriving there on the afternoon ~~of~~ the explosion.

Mine Supt. Knerr and General Mine Foreman Mahodile were at the mine when the explosion occurred, as has been previously stated in this report, and they took charge of the preliminary work of restoring ventilation and assisted in the escape of the 7 miners as previously described.

Company Inspector R. Y. Muir and Chief Engineer G. S. Borden were at Berwind, W. Va. when they heard of the explosion and they left there that evening arriving at Layland the next day, March 3rd, at 1:30 p.m., or 20 hours after the explosion. At the same time Mining Engineer J. W. Paul, and Assistant Mining Engineer H. D. Mason, Jr. of the Bureau of Mines arrived from Pittsburgh, Pa., also eleven volunteer rescue men from Gary, W. Va. in charge of Chief Chemist Vitus Klier, in response to a telegram from Mine Rescue Car 8.

At the time the explosion occurred, Mine Rescue Car No. 8 was at Glenalum, W. Va. engaged in training work. (275 miles from Layland).

J. W. Paul received word of the explosion at Pittsburgh, Pa. at 10:00 a.m., March 2nd and at once telegraphed to Car 8 to proceed to Layland. Thanks to prompt handling by the officials of the Norfolk and Western and Chesapeake and Ohio Railways, a record breaking run was made from Glenalum

to Layland by Car No. 8.

Leaving Glenalum at 12:50 (noon) the run of 104 miles to Kenova, W. Va. was made with a special engine in three hours. At Kenova the car was turned over to the C. & O. Railway where a clear track had been telegraphed for. Car 8 was hitched onto what was said to be the second largest passenger engines in the world, and a flying trip was made over the sharp curves in the New River Canon.

The run was made from Huntington to Quimmimont with only one stop for water at Thurmond, and the 133 miles covered in three hours and sixteen minutes, which is said to be a record over this mountain division. The car was then pushed up the steep six-mile grade from Quimmimont to Layland reaching there at 9:37 p.m., a flying journey of only 8-3/4 hours from Glenalum.

The crew of Car 8 consisted of D. J. Parker, Mining Engineer; Dr. W. A. Lynott, Mine Surgeon; H. D. Jones, Foreman Miner; R. H. Seip, first-aid miner, and Edwin Staley, Clerk, all trained apparatus men. District Inspector E. C. Lambert, who was inspecting the Glenalum mines that day, also accompanied Car 8, and arrived with the car crew at Layland. Chief Inspector Earl Henry from Charleston also joined the car at Quimmimont and rode up on the car from Quimmimont to Layland.

Arriving at Layland at 9:37 p.m., the rescue apparatus was hastily placed into the waiting incline car and the crew pulled up the steep incline ^{at the top of which} ~~to the top of the mountain where~~ a motor trip was waiting, in which they were immediately hauled two miles around the mountain-side to No. 3 Mine,

where Mining Engineer D. J. Parker at once reported to Chief Henry and General Superintendent Bertolet that he was ready to render any possible assistance.

Meanwhile District Inspectors Absalom and Holliday had arrived at the mine that afternoon about 4:00 p.m. and had been organizing parties for the forwarding of systematic rescue work.

Mine Superintendent Clapperton had also arrived that afternoon from the Minden mines, operated by the same company, and had brought with him a dozen volunteer rescue men from Minden Mines. The following day many volunteers arrived from Quinnimont, Thurmond, Sun, Beckley, Eccles and Minden, all anxious to do what they could. After the shifts had been regulated, the company established a regular scale of wages for the brattice and stretcher men engaged in the recovery work in six-hour shifts.

The company did not have any breathing apparatus at the Layland Mines, and only a very limited supply of safety lamps; so that all this necessary equipment had to be procured elsewhere.

At the Jed Mine, Havaco, W. Va. (Near Gary) this company had installed five new Draeger apparatus and had several well trained crews, (trained by Car 8 in December, 1914) and D. J. Parker telegraphed for the Jed crew and apparatus at the same time he telegraphed Gary; but the Jed crew failed to respond.

General Superintendent O'Toole, of the U. S. Coal and Coke Co., Gary, W. Va., instructed Chief Chemist Vitus Klier to proceed with 10

men and their five Draeger apparatus, oxygen pump and extra oxygen cylinders. So that, when these eleven courageous and well trained Gary men arrived at Layland to assist the Bureau of Mines men, (there being no trained men at Layland) there were enough men and apparatus for the formation of three crews.

DAILY PROGRESS OF RESCUE AND RECOVERY WORK.

March 2, 1915: (First day) The explosion occurred at 8:30 a.m. and soon afterward the preliminary rescue and recovery work was done under the direction of Supt. Knerr and Mine Foreman Mahodile in repairing and re-starting the fan and in erecting temporary canvas brattices along the No. 3 Main Air course and at the overcast leading to the Tunnel entries (see map).

As the drift mouth of No. 3 Main entry was badly fallen, no attempt was made to advance into this entry, also because it was the "return" airway. No. 3 Main aircourse was the "intake" airway, the fan operating as a "blower", and after the fan had been restarted, an advance was made for 700 feet in by on this Main Aircourse to the wrecked overcast. (See map and sketch "D".)

At this point canvas was erected to block off the air current from entering the Tunnel entries and direct it into the No. 3 Main Aircourse. While this work was in progress, under the direction of Supt. Knerr and Mine Foreman Mahodile, the seven miners were met coming along the air-course and assisted outside, as described earlier in this report.

About 1:00 p.m., Supt. Clapperton arrived from Linden Mines (25 miles distant) and took charge of a brattice party in No. 3 Main Aircourse. As all stoppings between the Aircourse and Haulage-way were destroyed, the progress was necessarily slow, as each crosscut had to be well canvased. By evening, these brattice parties under Supt. Clapperton had advanced as far as the 5th Left (see map) along No. 3 Main Aircourse. No more live men were found but four dead bodies were located. Meanwhile General Superintendent Bertolet had arrived and he took complete charge of all recovery operations.

When Chief Inspector Henry arrived that evening, General Superintendent Bertolet did not turn the authority over to him, but he (Bertolet) assumed the chief authority for all rescue and recovery operations.

Messrs. Bertolet and Henry generally directed operations from the outside, although often they went into the mines to observe the progress of the work.

District Inspectors Holliday and Absalom arrived at the mines about 4:00 p.m. and at once conferred with Bertolet concerning recovery operations. At this time Supt. Clapperton was pushing the work with his brattice crews beyond the 5th Left on the 3rd Main Aircourse, and his intention was to proceed to the faces of the No. 3 Main entries. However, another plan of procedure had been formulated and that evening Supt. Clapperton and his crews were ordered to withdraw from No. 3 Main Aircourse, as it was now determined to advance on the Tunnel entries.

It seemed to be the general opinion among the officials in charge that the explosion had originated in No. 3 Mine, therefore, it was useless to proceed further into No. 3, but that the Tunnel entries and No. 4 Mine offered a better opportunity for the saving of human life. Therefore, although Supt. Clapperton was loathe to abandon the advance into No. 3 Mine, the plan of procedure was changed that evening, and a tight stopping erected across No. 3 Main Aircourse just inby the Main Tunnel Aircourse, which resulted in turning the air current into the Tunnel Aircourse, and consequently shutting the air off from No. 3 Main Aircourse.

The advance then began inby the Tunnel Aircourse (see map), and as all stoppings here were destroyed the progress was necessarily slow.

This was the status of the recovery work when Car 8 arrived at Layland at 9:30 p.m. along with Chief Mine Inspector Henry, District Inspector Cobb and Deputy Inspector E. C. Lambert, who had come with Car 8 from Glenalum.

Mining Engineer D. J. Parker at once proceeded up the incline with the other members of the car crew, Jones, Seip and Staley, all wearing Fluess apparatus. Arriving at the offices near No. 3 Mine, D. J. Parker at once reported to General Superintendent Bertolet and Chief Inspector Henry that the Bureau apparatus crew were ready to assist in any way.

General Superintendent Bertolet, and other company officials,

together with Chief Henry and District Inspectors Cobb, Holliday, Absalom and Lambert now held a consultation in the Company offices lasting somewhat over an hour. Meanwhile D. J. Parker and apparatus crew awaited orders at the foreman's office near the mouth of the mine.

At 11:50 p.m. (midnight) Chief Henry instructed D. J. Parker to proceed with his apparatus crew into the mine with District Inspectors Holliday and Cobb. D. J. Parker noticed that Mr. Bertolet had a blue print of the mine with him and asked for a copy, to which Mr. Bertolet replied that "this was the only print they had at the time and they did not want to lose it."

Bertolet opened the blue print for Parker's inspection and said that it had been decided to work inby the Tunnels towards No. 5 Mine, as they thought that if there were any live men inside the mine, they would find them in this section; also he pointed out the place along the Tunnel entries to which the fresh air had thus far been advanced, which was 2400 feet inby the Tunnel entries where the 1st Left entries (abandoned) turn off (See map.).

With Inspectors Holliday and Cobb in charge of a crew of 30 brattice men, the Bureau apparatus crew of 4 men, Parker, Jones, Seip and Staley, also Mine Surgeon W. A. Lynott (without apparatus) proceeded into the mine (700 feet inby No. 3 Aircourse, then 2400 feet inby the Tunnel Aircourse) to this fresh air base of operations, arriving there shortly after midnight.

March 3rd; (Second day) 12:00 (midnight) to 2:40 a.m.

Inspector Holliday requested Parker's apparatus crew to explore the workings ahead of the air. Mr. Holliday had a rough pencil sketch of the Tunnel entries and this was looked at by D. J. Parker and crew, who then advanced up the aircourse to the left. The canary bird was overcome at a point 100 feet beyond the fresh air base and the crew returned and placed the canary in fresh air. (There were only two canaries on Car 8).

The apparatus crew then advanced 500 feet encountering several high falls and finally the entire entry seemed to be caved-in. The crew returned and reported conditions to Mr. Holliday, who then requested an exploration on the parallel entry to the right (see map). This advance for 500 feet was made and conditions found to be similar to those observed on the aircourse. The crew was compelled to crawl at least 100 feet over falls on this trip.

Conditions were reported to Inspector Holliday, who then requested explorations through crosscuts to the right off the entry which the crew had just explored. The pencil sketch Inspector Holliday had did not coincide with the workings as found on these explorations.

The apparatus crew then advanced through one of these crosscuts to the right and found a third parallel entry on which they advanced 450 feet finding no falls.

It was evident to the Bureau crew that they were exploring old workings and this was reported to Inspector Holliday. On the return from the third exploration an overcast to the left had been noted by the crew and an entry containing track, which was reported to Mr. Holliday.

Supt. Knerr joined the party at this juncture and there was a consultation between Inspector Holliday and Supt. Knerr concerning the location of the party, but no agreement was reached.

Supt. Knerr and Inspector Holliday traveled back and forth on the entries a number of times in an effort to determine the location, so that the brattice work might proceed.

D. J. Parker then reported to Inspector Holliday that the apparatus crew would have to proceed outside, having only ten minutes oxygen supply, which they did at 2:40 a.m.

The apparatus crew proceeded to the Company offices and reported there to General Superintendent Bertolet. While waiting for further instructions, Bertolet was called to the telephone, and then asked D. J. Parker if there was any oxygen in their apparatus, as Inspector Holliday had been overcome inside the mine and assistance was requested.

The apparatus crew at once re-entered the mine and had advanced 700 feet to the Tunnel Aircourse turn off, when they met Inspectors Holliday and Cobb walking outby, Cobb holding Holliday's arm.

Mr. Holliday walked very unsteadily, as though he had been affected by afterdamp, but he refused Parker's assistance to the outside. The apparatus crew then returned down the mountain to Car 8, cleaned and recharged their apparatus and went to bed.

The advance inby the Tunnel aircourse (see map) was retarded during the night and next morning by the uncertainty as to where brattices

should be placed, and the building of some half dozen brattices at the wrong points, which brattices had to be torn out again.

However, the work proceeded steadily in by, Inspectors Lambert and Absalom taking charge of the 6:00 a.m. shift of brattice-men. No bodies were as yet located along the Tunnel Aircourse, although two were found at the Sub-station (see map) on the Tunnel Main entry located about 500 feet beyond the No. 4 Main turn off. These were the bodies of John H. Smith and John Atkinson, the 5th and 6th bodies brought to the outside and both were badly burned and showed evidences of violence. All bodies had to be carried to the outside on stretchers, ~~there being no means of hoists and this made the~~ *rendering this* work slow and difficult.

9:30 a.m. The apparatus crew from Car 8 returned from the car to the mines with freshly charged apparatus and reported for duty to Chief Henry at the Company office. Chief Henry advised D. J. Parker that no apparatus work would be required for some time, as the brattice work along the Tunnel Aircourse was progressing rapidly. The crew then returned to Car 8 and moved the oxygen cylinders, oxygen pump and apparatus supplies up the incline to the supply house, situated about 1000 feet from the No. 3 drift mouth. Supt. Knerr gave the Bureau crew permission to use the supply house as a base of supplies, and after the arrival of J. W. Paul that afternoon, it was also decided to use this supply house for sleeping quarters for the apparatus crews ^{*when off duty.*} Blankets were secured from Car 8 and the men slept on the floor of the supply room.

1:30 p.m. J. W. Paul, Mining Engineer, and H. D. Mason, Jr., Assistant Mining Engineer arrived from Pittsburgh, Pa., also the following party of 11 volunteer apparatus men from Gary, W. Va.: Chief Chemist Vitus Klier, (in charge); H. L. Ross, James Thirtle, H. K. Payne, Richard Haynes, John Christian, Louis Toth, Andy Toshie, Nick Sharkey, Julius Kovacs and Mike Shipiczky. The Gary men brought with them five Draeger apparatus, one Draeger pump, and two cylinders of oxygen, all of which were at once stored in the supply-house.

With the arrival of W. J. German that night from Pittsburgh, Pa., J. W. Paul designated three crews, as follows:

Parker's Crew - D. J. Parker, Captain.
H. D. Jones.
R. H. Seip.
Edwin Staley
H. L. Ross from Gary.

Mason's Crew - H. D. Mason, Jr. Captain.
James Thirtle from Gary
Vitus Klier " "
Andy Toshie " "
Richard Haynes " "
John Christian " "

German's Crew - W. J. German, Captain.
H. K. Payne from Gary
Nick Sharkey " "
Louis Toth " "
Julius Kovacs " "
Mike Shipiczky " "

During the afternoon, the three apparatus crews held themselves in readiness for a call at the supply-house, while J. W. Paul proceeded to the mine and conferred with Chief Henry and General Manager Bertolet as to the progress of the work, but no request was made of Mr. Paul for suggestions.

Chief Engineer G. S. Borden and Company Inspectors R. Y. Muir had arrived at Layland with J. W. Paul, and Mr. Muir secured for Mr. Paul a small blue print of Layland No. 3 Mine, (300 feet to the inch scale) which was the only mine map the Bureau representatives could secure during the recovery work at Layland mines.

6:00 p.m. to 12:20 (midnight): J. W. Paul and Mason's apparatus crew consisting of Thirtle, Klier, Toshie, Haynes and Christian accompanied the night shift of 23 men in charge of State Inspector Murray, Company Inspector R. Y. Muir and General Mine Foreman Nahodile proceeded inby the Tunnel Aircourse to the 2nd Left (see map) to which point the brattice work had been advanced. Inby the 2nd Lefts was an 80-foot swag filled with water from 2 to 3 feet deep. An effort was made to go up the 2nd Left (abandoned workings) and through an old room to 3rd Left, thus avoiding this water. This, however, was found impracticable, and the building of a pontoon bridge across the water consumed several hours, not being completed until 11:45 p.m. Mason's apparatus crew assisted in carrying lumber and brattice cloth, as they had no exploration work to do during this shift.

Upon the completion of the bridge, (R. Y. Muir and two others having previously waded the water as far as 3rd Left) the rescue crew and brattice crews crawled over the bridge and advanced to 3rd Left (see map).

The air current had been diverted up 3rd Left (the first working entry off the Tunnels) by a temporary canvas across the Tunnel Aircourse erected by R. Y. Muir and his assistants, and an advance was now made up the 3rd Left to Room 3, and three bodies located in Room 3. The shift was

now over and the entire party proceeded outside arriving at the "check-house" at 12:20 a.m.

The advance made on this shift seemed slight, from 2nd to 3rd Left, but the difficulties encountered rendered the work very slow. Thus far only six bodies had been taken from the mine, following over 36 hours recovery work, these three bodies discovered in 3rd Left off the Tunnel Aircourse making a total of 9 bodies found.

The delay caused the previous night over the proper location of the 1st Lefts off the Tunnels had held the work back considerably.

March 4th: (third day) 12:20 (midnight) to 7:20 a.m.: Inspectors Absalom and Lambert entered the mine with a brattice crew of 30 men and Parker's apparatus crew consisting of Jones, Seip, Staley and Ross. The bratticing and recovery work on the 3rd Lefts off the Tunnels was completed, 11 bodies being removed. Body No. 17 found at the face of the 3rd Left Aircourse had the head practically severed, and all bodies found on the 3rd Lefts showed evidence of severe heat and violence.

These entries are over 900 feet in length and the rooms 300 feet long (see map). Parker's apparatus crew made explorations ahead of the air in three rooms and to the faces of the entries. One of the brattice party, Jack Stewart, was overcome while venturing too far into Room 6 ahead of the air, but he was revived by Inspector Lambert administering the Shaefer method of artificial respiration and by Seip giving him oxygen from the bottle off his apparatus.

During this shift, Parker's apparatus crew traveled a total distance of 4200 feet under oxygen and were compelled to crawl in many places. It might be well mentioned at this point that the traveling in the rooms was rather difficult, especially for men wearing apparatus, as no top was "brushed", and the average height was only 48 inches.

7:20 a.m. The crews, under Inspectors Lambert and Absalom, checked out of the mine.

7:20 a.m. to 12:00 (noon): A shift of 72 men entered in charge of Inspector Holliday and Chief Henry. F. P. Bayless, of Eccles, W. Va., J. W. Paul and W. J. German's apparatus crew also entered the mine shortly after the other crews.

The brattice work was now advanced to the 4th Left off the Tunnels (see map), and German's apparatus crew advanced beyond the air to the faces of the Main Tunnels, a round trip of 1500 feet, at the request of Chief Henry. Six bodies were located and one carried back in canvas to the fresh air base by apparatus men German, Payne, Kovacs and Toth under oxygen, to hasten the work. An apparatus exploration was then made 600 feet in by 4th Left and nine bodies located; (14 bodies were ultimately recovered on the 4th Lefts) the Wolf safety lamp being extinguished one hundred feet in by. Accordingly, Chief Henry gave orders to proceed with the ventilation of the 4th Lefts. As the remainder of his crew had exhausted their oxygen supply, German made an exploration of the 5th Left by himself and reported four bodies there. German and his apparatus men performed very severe work on this shift and were

praised for the same by Chief Henry to other Bureau employees.

12:00 (noon): German's apparatus crew and the crews under Inspector Holliday were checked out of the mine.

12:00 (noon) to 8:00 p.m.: Brattice crews and stretcher crews, under Inspectors Blenkinsopp and Murray proceeded to remove the bodies from the 4th and 5th Lefts and Tunnel Entries, (a total of 26 bodies found, all burned and some showing evidence of violence) and Chief Henry decided that no apparatus work was required, as all this territory had been previously explored by German's crew.

12:00 (noon): Mason's apparatus crew reported at the drift mouth to Chief Henry and J. W. Paul but were ordered to return to the supply-room and rest until further orders were issued.

8:00 p.m. to 12:00 (midnight): A shift of 53 men, in charge of Inspectors Lambert and Absalom completed the work in the Tunnel entries and advanced the ventilation to the mouths of the No. 4 Main entries (see map) at which point two wrecked concrete overcasts rendered the erection of air tight brattices somewhat difficult. This crew worked with the idea of directing the air current onto No. 4 Main Aircourse, so that the work of recovery might proceed in No. 4 Mine (see map).

March 5th (fourth day):

2:55 a.m.: J. W. Paul and the three apparatus crews sleeping *in* ~~the supply room~~ the supply room were aroused by a messenger reporting that the fan had broken down and Inspectors ~~and~~ Lambert and Absalom were inside the No. 4 Mine with 53 men.

J. W. Paul ordered Parker's crew to don their apparatus at once and Mason's crew to be ready also. Paul and German hastened to the mine and assisted in repairing the fan (the chain had broken by which the fan was ~~driven~~ driven, and a new chain was put on, during which repair work the fan was probably stopped for about 15 minutes). William St. Clair, who had been at the check-house, had hurried into the mine to notify the crew concerning the stoppage of the air. However, before this messenger reached their party, Inspectors Lambert and Absalom, (as Inspector Lambert afterward related to H. D. Mason, Jr.) noticed the decided slackening of the air current and ordered their crew to start out at once. They met St. Clair on their way outside and arrived at the pit mouth at 3:20 a.m.

3:40 a.m. to 7:30 a.m.: Inspectors Absalom and Lambert with 12 brattice men, J. W. Paul, German and Parker's apparatus crew re-entered the mine and proceeded on the erection of brattices to direct the air current along No. 4 Main Aircourse (see map). Some delay was occasioned by the long, circuitous and rough route, (3000 feet) over which the brattice material had to be carried from the outside and the shortage of men owing to the fact that about 40 men had left the party after going outside because of the stoppage of the fan. Parker's apparatus crew acted as reserve on this shift and were not called upon to do any exploration work. On the way outside at 7:30 a.m., the apparatus crew with Inspectors Lambert and Absalom went through onto No. 3 Main entry at the Tunnels and traveled outside on No. 3 Main seeing one body and encountering one fall about 150 feet inby from the drift mouth, and another high fall at the drift mouth. The

canary was not affected on this trip.

With regard to the heavy fall blocking the No. 3 drift mouth, it is well to mention that this fall had not been one-half cleaned up at this time and three days had elapsed since the explosion. The work seemed to go very ~~slowly~~ slowly in cleaning up this fall, and it was evidently the plan of General Manager Bertolet to explore No. 3 Mine the last of all. Although several hours after the explosion seven men had escaped from No. 3 Mine, ^{none of the officials} ~~nobody~~ seemed to think that there might be more men alive further in by in No. 3 Mine. It seemed the general idea at this time that all had been killed inside the mine and the Bureau representatives did not hear anybody advance the idea that there might possibly be men yet alive in any portion of the mine. The Bureau men, themselves, had a rather vague idea of the mine lay-out from the small map received and scant information ^{volunteered} ~~conferred~~ by the officials.

9:00 a.m. to 12:20 (noon): Mason's apparatus crew consisting of Thirtle, Klier, Toshie, Haynes, and Toth entered the No. 4 Mine in charge of Inspectors Holliday and Cobb with a shift of 40 men.

German was on his way outside when he met Mason and advised him that he was going to consult Chief Henry and J. W. Paul, as he thought Inspector Holliday was working the brattice crews too far ahead of the air, having failed to brattice off the 1st and 2nd Lefts off No. 4 Mains; so that, the afterdamp from these old workings was being carried forward to the brattice crews, who had started working near 3rd Left (see map).

Shortly afterward, Chief Henry came in with German and ordered

Holliday to have the 1st and 2nd Lefts bratticed off, which was done. Holliday then requested Mason to have his apparatus crew explore the 3rd Left and if no bodies were found, it could be closed off and the work advanced to the 4th Left.

Mason's crew, accordingly, adjusted their apparatus and advanced into the 3rd Left entry, (Inspectors Holliday, Cobb and their 40 brattice men meanwhile waiting out on the 4th Main Aircourse] and proceeded inby with flashlights only for a distance of about 1100 ft. the canary having died 200 feet from the fresh air base. It was found here that the track was torn up and the entry abandoned; so that the crew returned to the 4th Main Aircourse and Mason reported conditions to Inspectors Holliday and Cobb.

Accordingly, the mouths of the 3rd Lefts were at once bratticed off and the work proceeded along the aircourse to the 4th Left. Here Holliday requested Mason to have his apparatus crew explore along the 4th Main Haulage way to the point where 6th Left off No. 3 Main was broken through, (see map) to ascertain whether or not the return air was traveling through this opening, (where there had been a stopping previous to the explosion) towards No. 3 Mine.

Mason and Thirtle then advanced under oxygen, leaving the other four apparatus men as a reserve, through the 4th Left chute, (in which a steel car was overturned and badly wrecked) onto the 4th Main Haulage way and advanced 500 feet to a point where there was a break-through to the right, (see map) which had been swept clean by

the explosion, and through which the air current was traveling towards No. 3 Mine. An additional advance of 500 feet was then made to the point where the chute came onto the Haulageway from 6th Left, near which point on the haulageway was found a dead miner in a sitting posture on the right hand rail, he had apparently been overcome by afterdamp.

Mason and Thirtle then returned (roundtrip 2000 feet) and reported conditions to Inspector Holliday, and as the shift was now completed, the entire party proceeded outside. At the pit mouth Mason reported to Messrs. Paul and Henry the conditions as observed in No. 4 Mine, and ~~the~~ the fact that the air current from No. 4 Main Entry was apparently traveling through No. 6 Left to No. 3 Main entry, (see map) thus rendering No. 3 Main "the return" for practically the entire mine.

1:00 to 7:00 p.m.: Parker's apparatus crew and a shift of 42 men in charge of Inspectors Blenkinsopp and Murray proceeded into No. 4 Mine and advanced the work into 5th Left, where nine bodies were located. Parker's apparatus crew explored Room 1 off 5th Left and located one body therein. As the traveling * in the rooms was very low and arduous, Parker suggested to Inspector Blenkinsopp that the air current be directed up the rooms, as this would have to be done in any event before the bodies could be recovered.

Inspector Blenkinsopp then requested an ~~exploration~~ exploration of the 5th Left entry, and Parker's crew made this exploration of 700 feet, their safety lamps being extinguished a short distance inby the 5th Room.

A second trip to the faces of the 5th Lefts was made at the request of Inspector Blenkinsopp to verify the number of cross cuts. Upon returning from this trip, Chief Henry arrived at the 5th Left and requested Parker to make an apparatus exploration of the No. 4 Main entries inby 5th Left and ascertain conditions.

Accordingly, Parker's crew advanced under oxygen inby the No. 4 Main Aircourse from the 5th Left to the 8th Left, a distance of 1500 feet, (where the oxygen of some of the apparatus was about exhausted) and they observed that inby the 7th Left, there was no disturbance whatever, all stoppings and doors being intact and no evidences of violence. On body was observed at 7th Left. These conditions were reported to Chief Henry and at 7:00 p.m. the entire party came out of the mine, this shift having recovered nine bodies from 5th Left most of which gave evidence of burns, and some also of violence.

Parker's crew had traveled 4600 feet under oxygen on this shift and were tired out; so Mr. Paul ordered them to go down to Car 8 to secure some restful sleep, as the hard floor in the supply room and cool draughts from the doors were not conducive to much good rest for the members of the apparatus crews, *sleeping in the supply room.*

9:50 to 10:40 p.m.: Following a conference between Chief Henry, General Superintendent Bertolet and J. W. Paul, Mason took charge of an apparatus crew of three, Mason, German and Thirtle (All lightweight and active) and explored No. 3 Main entry for a distance of 4000 feet to 6th Left. (see map).

The object of this long exploration was to determine the conditions on No. 3 Main entry, also whether the return air was coming through No. 6 Left from No. 4 Mine. Mason, German and Thirtle proceeded inby finding only two sizable falls of top, one dead body just beyond the Tunnels; two short trips of empties slightly damaged; and the "return air" seemingly of fair quality, as the canary bird carried by Mason showed slight signs of discomfort, the Koehler safety lamps continued to burn, and the air seemed fairly cool. Upon arriving at 6th Left, it seemed to the members of the crew that a slight air current was issuing from the 6th Left, where the door had been blown open and wrecked by the explosion. Mason marked with chalk upon a board trolley "protector" which had been displaced by the explosion at the mouth of 6th Left, "German, Mason and Thirtle, 3-5-15" and then gave orders for the party to return outby, as this was as far as J. W. Paul and Chief Henry had issued orders for the party to advance.

This round trip with apparatus was for a distance of 8,000 feet and upon return to the Tunnel entries at 10:40 p.m., Mason, German and Thirtle met J. W. Paul and Chief Henry awaiting them, and Mason reported upon conditions as found inby No. 3 Main entry (haulage-way).

(Note: A crew of eight Gary apparatus men under Vitus Klier had been at the drift mouth as reserve party during this exploration.)

Mr. Paul then ordered Mason, German, Thirtle and the nine Gary apparatus men to return to the supply room and rest for the night. (11:00 p.m.)

This exploration had a very important bearing upon subsequent

events, as Chief Henry now decided to call everybody out of the mine, (there was still one party working in No. 4 Mine) and to stop the fan, so that the necessary repairs might be made that night preparatory to reversing the fan the next morning, thus making No. 3 Main entry an "intake" airway instead of a "return"; so that, the recovery work might be rapidly pushed forward in No. 3 Mine.

Accordingly, upon orders from Chief Henry and General Superintendent Bertolet, all recovery parties came out of the mine and the fan was stopped at midnight. This seemed a providential circumstance, as there was a fresh air leakage from No. 2 Mine (as afterward discovered) through 1st Right (see map) upon No. 3 Main entry, and when the fan stopped, the "return" air containing "afterdamp" ceased to flow upon No. 3 Main, and this fresh air current came through upon No. 3 Main entry all that night, and so diluted and purified the air upon No. 3 Main, as to permit the most fortunate escape next morning of 47 entombed miners!

March 6th (fifth day): On this Saturday morning, there was little activity about the drift mouth, as the fan had been stopped and no recovery parties were entering the mine. All parties concerned in the recovery operations had endeavored to secure a sound sleep during the night, as an active recovery campaign in No. 3 Mine was to commence this morning.

Paul, Mason, German, Lynott, Klier, Thirtle and eight other Gary men had slept all night on the floor of the supply-room, Parker, Jones, Seip, Staley and Ross had slept on Car 8.

At 7:30 a.m. J. W. Paul proceeded from the supply room to the mine to note conditions; he found the fan idle, the large fan doors not yet in position, no workmen at the fan, and few people about. Mr. Paul then went to the mess nearby, drank some coffee and returned to the mine.

8:10 a.m. J. W. Paul went into No. 3 Main entry about 200 feet and was looking about, (nobody else having entered the mine) when he noticed an open light approaching from inside.

Mr. Paul was nonplussed for an instant, as he knew no rescue parties were inside the mine and could not think that anybody would risk carrying an open flame lamp. Then he realized that it was a miner, who had been entombed, and advancing met a foreign miner carrying a carbide light, followed by four others, who were fanning themselves with pieces of tin and dinner bucket lids. Mr. Paul stopped each man and asked him where he had come from. They each said, "Come from 9th Left, no more live men, one man dead." (Meaning that one of their party had died.)

Mr. Paul took the leader by the arm, (Salvitori Morici, whose statement will be given later in this report) led him outside to the checkhouse and called for the man in the check-house to take the names and check numbers of these five men. (Salvitori Morici, Gatano Maurello, Frank Rudoni, Peter Zanisky and Jack Foreman). They did not know of other live men in the mine.

St. Clair, who was at the check cabin hastened away to summon help and the news spread rapidly to all parts of the camp.

Mr. Paul met Dr. Lynott and ordered him to go to the supply room at once and get German's and Mason's apparatus crews, as there might be a chance for more live men in the No. 3 Mine. Mr. Paul also requested Mr. W. A. Brown to send a motor and messenger around the hill immediately to summon Parker's crew on Car 8 and this was done; then Mr. Brown assembled some men to start work on the fan doors.

When Dr. Lynott arrived at the supply room with the news, German just came in from breakfast, having heard the news, and Mason, Klier, Payne, Toshie, Christian and Kovacs were the only apparatus men in the supply room, the others being at breakfast. Lynott advised German and Mason that they were to get their crews ready at once and report to Mr. Paul at the drift mouth.

German, Mason, Klier, Payne, Toshie, Christian and Kovacs at once donned apparatus and proceeded to the mine, where they met Mr. Paul.

8:30 a.m.: German's crew (Payne, Klier, Toshie, Christian and Kovacs) proceeded into the mine under orders from J. W. Paul, who told them to proceed to 10th Left and ascertain whether or not there were other live men in the mine. Mason handed German the canary bird, (the last one alive) then Mason hastened back to the supply room to get his crew together to follow German's crew inside.

All was excitement at the drift mouth and shortly before German's crew went in, Inspectors Holliday and Cobb, along with Workman, St. Clair, Clapperton and two others had entered the mine and other rescue parties were being organized.

Before Mason's crew returned, Chief Henry and General Superintendent Bertolet entered the mine, and proceeded as far as 6th Left where they waited for news from the advance parties under Holliday and German.

8:50 a.m.: Mason and Thirtle, wearing apparatus, reported to Mr. Paul at the mine and at once entered the drift mouth. Haynes, Sharkey, Toth and Shipiczky had not arrived at the supply room in time to arrange their apparatus, so Mason ordered them to report to Mr. Paul later and act as a reserve crew. Just as Mason and Thirtle left the supply room, Parker's crew arrived on the motor from Car 8; so that this made a reserve crew of nine apparatus men, who were held at the drift-mouth all that day, under Mr. Paul's orders.

THE RESCUE OF 42 ENTOMBED MINERS.

As previously described, Inspectors Cobb and Holliday with St. Clair, Workman, Clapperton and two others were the first rescue party to enter the mine at about 8:25 a.m., followed very shortly by German's apparatus crew at 8:30 a.m.; then by Chief Henry and General Superintendent Bertolet at 8:40 a.m. (who stopped at 6th Left); then by a large party under Daniel Davis at 8:45 a.m. (who stopped about 2nd Left) and finally at 8:50 a.m. by Mason and Thirtle wearing apparatus.

The fan being stopped it was not known to these rescuers what they would encounter beyond 9th Left, although the escape of the five men that morning from 9th Left indicated that the air was fairly good as far inby as 9th Left.

Holliday's party of seven men (not wearing apparatus) proceeded

inby as far as 9th Left, where there was a message written on a brattice board in Italian, as follows: - "4-1915, 9th Left, 5 men in here 9th Left. Want help, help." (This was the message written by Salvatori Morici, who had led out the four other men that morning.)

Holliday's party turned into 9th Left and advanced inby on that entry 1000 feet, as far as room 16. No sign of any live men was seen and somebody then suggested that they should go back and go to 10th Left, which was done.

German's apparatus party, meanwhile, had passed 9th Left, (while Holliday's party was in there) and continued rapidly inby to 10th Left. Here at the switch point Klier pointed out to German a roll of cartridge paper placed in an upright position against the rail.

German picked this up and it proved to be a message written with a lamp wick as follows: "42 men alive in 10 Left, March 4, 1915 at 4:30 p.m.". This message was retained by German and delivered to J. W. Paul.

German's party at once turned into 10th Left and 150 feet inside the entry found a substantial stopping built of gob material and coal dust across the entry, (See sketch "I"). German took a piece of slate and signalled on the rail by rapping rapidly at short intervals and Klier thought he heard a response. The canary showed no signs of distress and the safety lamps were all burning normally, so German gave orders to tear down this brattice.

The crew responded heartily and soon an opening was made in the top of the stopping large enough to crawl through.

Meanwhile German dispatched Klier to the outside with the message that 42 live men were reported in 10th Left, which message was to be delivered to J. W. Paul and Chief Henry.

However, as Klier was hastening outby along No. 3 Main entry, he was met by Holliday and his party coming out of 9th Left, so he gave his message to Holliday, who ordered him to return with their party to 10th Left.

Accordingly, Klier joined Holliday's party and they all hastened to 10th Left where they found ~~German's~~ German's party had affected an opening through the first gob stopping and had encountered 200 feet further inby a second substantially built gob stopping.

Both parties joined in the tearing down of this stopping and then the miners inside heard the rescuers and there was a pandemonium of sounds behind the stopping.

Holliday then dispatched St. Clair as a messenger to carry the news of live men to Chief Henry, Bertolet and Paul, and St. Clair immediately started outby on the No. 3 Main entry.

When a large enough hole was finally made through the upper part of the second stopping, Inspectors Holliday and Cobb immediately crawled through and found the entombed miners inside. German and his crew then enlarged the opening, so that they could pass through wearing apparatus, and a joyous scene ensued, the rescued miners hugging and kissing their rescuers.

Meanwhile Mason and Thirtle had advanced inby the No. 3 Main entry, and at 6th Left they met Chief Henry and Bertolet waiting for news, as they

had not yet heard from the advance parties. Proceeding rapidly inby from this point, Mason and Thirtle passed 8th Left and encountered a wrecked motor trip, which partially blocked the entry. While crawling around this wrecked trip, a safety lamp was seen coming outby and St. Clair approached and advised Mason and Thirtle "that there were 42 men alive behind a barricade in 10th Left where Holliday, German and their parties were working with them, and that he was going outside to notify Henry and get help".

Mason advised St. Clair that he would meet Henry and Bertolet at the 6th Left where they were waiting for news. St. Clair proceeded outby and met Henry and Bertolet at the 6th Left and gave them Holliday's message. Henry and Bertolet hastened outside immediately and gave the news to get stretcher parties and a temporary hospital ready at once. St. Clair, they ordered to return to 10th Left to assist Holliday, which he did.

Mason and Thirtle had meanwhile reached 10th Left and assisted German and Holliday in getting all the rescued miners seated as quietly as possible along the left rib and in counting them off. After all 42 had been counted off and seated for a time, so that they felt strong enough for the long trip to the outside,(6000 feet) all were ordered to rise and grasp hands. Then the entire party moved slowly outby, the 14 rescuers walking alongside the 42 rescued men at regular intervals, so as to give sufficient light with their flash-lights and safety lamps.

(Note: This entire rescue party consisted of 15 men: German, Klier, Mason, Thirtle, Toshie, Payne, Christian and Kovacs - wearing

apparatus - and Holliday, Cobb, Workman, Clapperton, St. Clair and two others - without apparatus.)

The air seemed good, the canary thus far not showing distress, and the long procession moved slowly out the No. 3 Main entry, stopping at short intervals to afford rest for the weakened miners.

At 9th Left Mason, Thirtle and Toshie left the party to make an exploration of 9th Left as Mason desired to make certain as to whether there were more men alive on that entry; and it was certain that more rescuers would soon arrive to assist the 42 rescued miners outside. Mason, Thirtle and Toshie accordingly made the trip to the face of 9th Left and return (3600 feet) noting the curious fan which Salvatori Morici and his four comrades had improvised near the face and the 20 dinner buckets which they had gathered together, affording them sufficient food for their four day's entombment. (See sketch "H".)

No indication of other live men was found and Mason's party returned to the Main entry meeting two other rescuers, Joe Bunch and Sandy Anderson, on their way in. As Mason, Thirtle and Toshie were feeling very weak at this time they advised Anderson and Bunch to come outside with them, but they wished to remain. (Afterward both Anderson and Bunch were partially overcome but rescued by a party under Inspector Blenkinsopp.)

Mason's party finally reached the outside, on the rear of the outgoing party of 42 rescued miners, although their trip had been a trying one, (over three miles) and they felt the effects for many hours afterward.

All members of these rescue parties were effected by this accumulative effect of afterdamp, especially the eight men wearing apparatus, who were each carrying 38 pounds extra during their 2-1/2 hours exciting experiences.

11:00 a.m.: All 42 rescued miners had been brought outside and taken to the temporary hospital.

Mr. Paul's notes give the exact time of these occurrences at the drift mouth, as follows:

9:53 a.m.: Supt. Knerr came from the pit-mouth and reported that all rescuers were O.K. (Do not know from whom he secured information).

10:00 a.m.: Chief Henry and Bertolet came outside and Henry advised Paul that 40 live men had been found in the 9th and 10th Lefts and that these men had been found by German and that Holliday had gone to assist.

Dr. Lynott, Mr. Paul and others began the work of improvising stretchers out of boards and brattice cloth, giving them to stretcher crews to carry into the mine.

10:10 a.m.: The first 19 rescued miners came out and were immediately covered with blankets, loaded into empty cars and conveyed to the assembly hall, which had been fitted up as a temporary hospital. German came out and reported to Paul.

10:30 a.m.: Seven more miners were led out and hauled to the assembly room.

10:45 a.m.: Dr. Lynott entered to attend to some miners who were reported in a weakened condition.

10:50 a.m.: Twelve miners led out.

10:55 a.m.: Two miners carried out on stretchers.

11:00 a.m.: Two miners led out, one of whom refused to go to the assembly hall and disappeared around the motor-house.

11:05 a.m.: Mason, Thirtle and Toshie came out, feeling weak, reporting that they had left two rescuers, Anderson and Bunch, at the 9th Left, who had refused to come out with them, and advised that a rescue party be sent after them. This was done.

Just after these 42 miners had been gotten to the outside, General Superintendent Bertolet stepped up to Mr. Paul, shook hands, and said, "Jim, your men did some real rescue work to-day"; German overhead this remark and afterward repeated it to Mason and the other apparatus men.

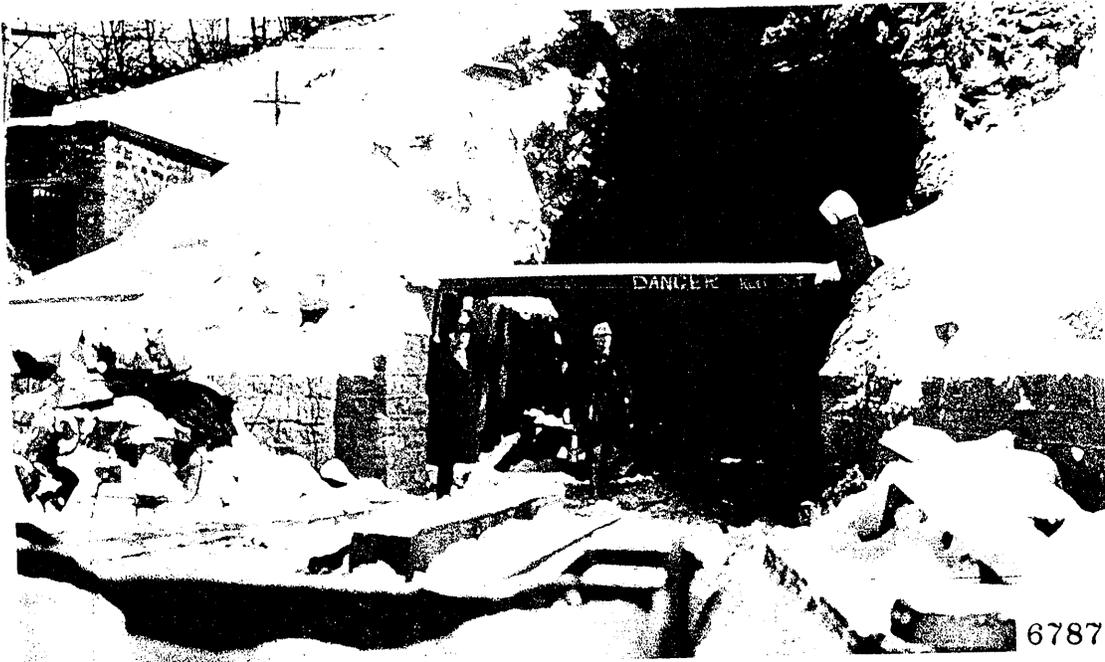
12:40 (noon): Company Inspector Muir ordered the fan started, (it had not been operated that morning) and it was run at 77 revolutions until 2:05 p.m., when it was increased to 90 revolutions.

The No. 3 Main entry was now the main "intake", although little air seemed to be entering. At 3:40 p.m. Inspectors Lambert and Absalom with J. W. Paul measured the air 300 feet inside the drift mouth, and found that only 4760 cubic feet per minute was passing. Apparently the return airway was blocked and Henry advised Paul that one of the Inspectors had failed to remove a stopping near the overcast



Arthur Caldwell, one of the 42 men rescued from 10th Left, after 4 days' imprisonment.

Far →



Drift mouth No 3 Mine, March 9, 1915.

at the Tunnels.

Mr. Henry spoke to Mr. Paul about having the apparatus crew enter the "return" airway through the funnel of the fan and remove this objectionable stopping, but Mr. Paul thought this impracticable, as better time would be made by breaking through a nearby stopping, to which Chief Henry agreed.

Inspector Lambert advised J. W. Paul that he had just been in as far as 6th Left and found there 25,000 cubic feet of air passing. ^{20240 cu. ft.} This increased volume was the result of the leakage from No. 2 Mine ~~as~~ heretofore mentioned in this report.

Accordingly, the stopping was removed at the Tunnel overcast and the other stoppings reinforced inby No. 3 Main and a recovery party in charge of Inspectors Lambert and Absalom continued exploration work inby No. 3 Mine.

8:30 p.m.: Inspector Blenkinsopp reported 10 bodies recovered from 8th Left, most of them somewhat burned.

8:35 p.m.: J. W. Paul ordered Parker's crew and the four Gary men, who had been held in reserve at the mine for 12 hours to go to the supply house for the night. Mason, German, Thirtle, Toshie, Christian and Kovacs were ordered by Mr. Paul to retire to Car 8 for a sound rest, as all were exhausted. Mason, German and Thirtle had worn the apparatus on three shifts in twenty-four hours, having had the apparatus on during that period for a total of 10 hours and having traveled a total distance of over seven miles.

Note: The separate sworn statements of J. W. Paul, H. D. Mason, Jr., D. J. Parker, W. J. German and Vitus Klier have all been filed concerning the detail of all this rescue and recovery work, and these statements may be consulted at any time for the confirmation of the facts as assembled in this report.

March 7th (sixth day): The ventilation having been fairly established in No. 3 Mine, recovery work was carried on by parties in charge of the various district Inspectors. Mason, Parker and German made a trip into No. 3 Main as far as 9th Left to ascertain conditions.

The apparatus crews rested at the Supply room, holding themselves in reserve under orders from J. W. Paul.

The recovery parties in No. 3 Mine, in which mule haulage was now expediting the work, recovered 10 bodies from 8th Left, one from 9th Left, six from 7th Left, three from 6th Left, one from 3rd Left and seven from various points along the Main entry.

March 8th (seventh day): The recovery work was practically completed, as the bodies remaining inside the mine were under heavy falls. During the day seven more bodies were recovered from No. 4 Mine, making a total of 109 bodies recovered. It was figured that probably ~~four~~⁵ additional bodies would be found under falls, etc. Chief Henry and his District Inspectors prepared to leave Layland, as did also the Bureau representatives and the eleven apparatus men from Gary, W. Va. J. W. Paul ordered Car 8 to remain at Layland until the investigation scheduled for March 15th had been completed. G. S. Rice arrived at

Car 8 from Pittsburgh, conferred with J. W. Paul and made a trip up to the mine. The West Virginia Inspection force departed that evening.

March 9th (eighth day):

11:50 a.m.: J. W. Paul, G. S. Rice, H. D. Mason, Jr., W. J. German and W. A. Lynott left Layland; Car 8 remaining with Parker, Jones, Staley, Seip and Elmo Bonds, cook.

STATEMENTS BY MINERS WHO ESCAPED.

The testimony of the five miners, who escaped from 9th Left, and the forty-two miners, who escaped from 10th Left, after four days' entombment, is very interesting and two of these statements follow:

Statement of Salvatori Morici: who led four others outside from 9th Left on March 6th. (See sketch "H").

"I am a miner at No. 3 Layland and work at face of 9th Left entry. I went to work about 6 o'clock Tuesday morning, March 2nd and the first thing I got five empty cars and my butty (Gatano Maurello) and I started to load them up in 9th Left. When I started to load the last car I heard something like a big shot a long distance away, it blew out my light and affected my ears. I called to my "butty" and asked him if he heard the shot, and he said "yes" and it had blown out his light also. Then we got a match from our coats and lighted our lamps and waited a few minutes and my "butty" said to me that he felt deaf and asked me what I thought about that shot? I told him that three or four rooms had fallen in with slate, then we started to load our car again. After we finished loading this car, we went and ate, and then started to cut coal again. In a few minutes two Russian

fellows came to my place and one Russian called, "Hey, butty " and I answered, "Hello" and he said, "There is a gas explosion". I said, "You are fooling me", but he answered, "Sure". "

"Then we stopped work and one of the Russians asked me if I knew the way to the aircourse, and we all started for there, and met two Italians on the way, making six of us together."

"We got to the Main aircourse but found smoke and bad air there and also on the Main entry. So I said to the men, "Let us all go back to my place where the air is good and wait there for help'."

"My butty, the two Russians and myself started back, but the two Italians tried to go out the Main aircourse, but found too much bad air. One of them came back to my place after while and said that the other man had fallen down in bad air and must be dead. The air in my place was not bad, it is about 1800 feet off the main heading and on the "rise"." (This was an important feature. The faces of both 9th and 10th Lefts were considerably higher than the Main entries, which retarded the heavy "afterdamp" from backing up into these places.)

"After a few hours we went back to the Main aircourse and found the air still bad. Then we all five came back to the face of 9th Left and built two wood brattices in the last two break-throughs, also a wooden brattice across the entry, in which we put a hole and through it a 20-foot plank with canvas wings on either end, which we moved up and down for a fan." (This was the fan Mason, Thirtle and Toshie saw on the exploration of the 9th Left.)

"Wednesday morning, March 3rd, at 7:00 o'clock, (I had my watch with me, also one Russian had a watch) we went out to the Main entry again, but the air was too bad and we returned. On our way back to the face we found dinner buckets in Rooms 13, 15, 16, 19, 20, 21, 22 and 23, also some carbide and a can of oil, all of which we took with us. This gave us plenty to eat and drink, also plenty of carbide and oil for lights." (They did not seem to realize any danger from open lights.)

"Every six hours we went out towards the Main entries and found the air getting better. On Thursday evening March 4th, I went and found that the air was good 60 feet from the Main entry. I wrote a notice in Italian with chalk on a brattice board at the mouth of 9th Left: "4-1915, 9 Left, 5 men in here in 9th Left, Want help, help."

"On Friday, March 5th, we found that the air was good 45 feet outby along the Main entry, so the next morning, Saturday, March 6th, I talked to my friends and we decided to try to get outside, but if we found bad air we all promised to return together. We made fans out of our dinner buckets and put our handkerchiefs over our mouths and noses. So we started out on the No. 3 Main entry and didn't find much bad air, and got outside about 8:00 o'clock, Saturday morning."

Statement of Hugh G. McMillan, who escaped with the 42 men from 10th Left: (See sketch "I").

"I am a day man in Layland No. 3 Mine and went to work at 7:00 a.m. on Tuesday morning, March 2nd in 10th Left entry to put up some trolley wire. I got some holes drilled for expansion bolts, when suddenly I heard a suction and I knew there was an explosion coming. I fell flat on my face and the force of the wind went over me, then getting up I ran along the room necks and called to all the men to come out that there was an explosion in No. 5 Mine, I thought. Some of the men would not believe me but we went out on the Main entry to see and walked out by on No. 3 Main entry until we came to a wrecked motor trip near 8th Left, and found the smoke dense and hot at that point, and knew we could not get out."

(The wrecking of this trip at this point apparently blocked the entry so effectually, that the violence and afterdamp were thus
and
checked off from 9th ~~to~~ 10th Lefts.)

"As we returned towards 9th Left we met some men coming out of 9th Left and took them back with us to 10th Left. Two men, however, would not go back with us, and we saw their dead bodies near 8th Left, as we came out Saturday morning with the rescue party."

"In 10th Left the air was good and we decided to get everybody into 10th Left, so I went to 11th Left for some brattice cloth and got the men from there to come back with me, also the men from the Main entries."

"First we took off the brattice door in the slant, which had not been displaced by the explosion in order to short circuit the air current. We counted our party and found there were 42 men. Then we retreated

about 150 feet into the 10th Left and built a permanent gob stopping, about 8 feet thick at the bottom and also built one across the air course. Two hundred feet further inby, we built another dirt stopping and also another across the aircourse. Thus we were doubly protected by two tight brattices and the air was also short circuited outside at the entry mouth; so that even if the fan had pushed the "damp" back into our section none could have come through our stoppings. (See sketch "I" and mine map.) We had plenty of men to help and all these stoppings were completed early the first day."

"After another day had passed some of the men began to get restless. We thought that probably heavy falls had kept the rescue parties from getting back to us. We had trouble in keeping the foreigners from making lights, as we realized the dangers from gas. We did not permit over one light to be going at a time and that was kept down on the bottom. We had plenty of air space back of us in the entry and the air kept good, and we had plenty of water, with two barrels full of water inside the brattice. The food supply, however, soon began to get low, as there were 42 men in our party and the contents of all dinner buckets were eaten the first few days."

"Finally the Italians got very restless, and although the 14 Americans in our party thought the air would be bad outside the brattices, yet the Italians were so determined to start outside, that we wrote a note for one fellow, Angelo, on a long piece of cartridge paper with a lamp wick as follows: '42 men alive in 10th Left, March 4, 1915 at 4:30 p.m.' "

"We gave him this note and told him to leave it out at the switch on the Main entry. Then we made holes in the two brattices large enough for him to crawl through and he started out the entry. We did not risk giving him a light but told him to guide himself out by the rail and trolley wire."

"Pretty soon we heard a call for help out from the brattice and two men went out with a light and found Angelo unable to walk, as the "afterdamp" had been too much for him. So we pulled Angelo in through the brattices as quickly as possible and closed them tight again. After that (Thursday evening) we had no more trouble with the Italians, but we all began to feel pretty bad, and held some prayer meetings and wrote letters for our wives and families."

"We were getting mighty hungry and weak and had about decided that on Sunday morning, ~~Monday~~ March 7th, we would make a try to escape, as we would still be strong enough and have enough lights remaining. We could not think what was keeping the rescue parties away so long. Days seemed like ages back there in the darkness. Finally we heard the rescue party working on our inside brattice, Saturday morning, March 6th, and they came in and helped us all outside."

(See sketch "I").

"Letter written by one of the 42 entombed miners: "Saturday morning, March 6th, 8:00 o'clock.

Dear Effie,- We are still alive but getting pretty weak. Oh! God hast thou forsaken us? Sweetheart, I am still living in hope and trusting that if we don't meet in this world, let us hope to meet

in Heaven. God watch over you and keep you is my everlasting prayer.

Bye, Bye,

(Sgd.) Charlie.

We are not worrying over anything but your sorrow and for you."

The names of the 14 Americans among these 42 rescued miners are as follows: George Parker, L. O. Caldwell and Charles Caldwell, (brothers) Sam Huggard, John Whalen and Thomas Whalen, (father and son) John Fitzwater, William Derenge, G. H. Hensen (father of 7 children), Howard Huggard, Hugh McMillan, John Fitzpatrick and Lester Fitzpatrick (father and son), and John Plush. The remaining 28 men were mainly Italians and Slavs.

Of the 115 men killed by the explosion there were 36 Americans, (including one negro on the outside) 31 Austrians, 22 Italians, 21 Russians, 2 Syrians, 2 Scotchmen, one German, one Spainard, one Welshman and one Englishman. *(44 men were killed by suffocation)*

Grouping them by occupations there were 85 miners, 7 trip-riders, 5 track-layers, 4 motormen, 2 mine foremen, 1 pumpman, 3 electricians, one slateman, one sub-station man, 3 men not yet on the pay-roll, and one store-porter (negro).

The total distance covered by the apparatus crews during the recovery work at Layland was compiled by J. W. Paul, as follows:

Name of Crew	Distances in Feet.		
	In Fresh Air	In Afterdamp	Total
Parker	34,220	14,750	48,970
Mason	35,020	11,760	46,780
German	23,020	2,240	25,260
Totals(feet).....	92,240	28,750	121,010
Totals (miles)	17.4	5.4	22.8

Extra trips: German(alone) 2,000 feet in afterdamp.

Mason, German and Thirtle, 7560 feet in afterdamp.

Note: The rescue apparatus worn (Fleuss and Draeger) averaged 38 to 40 pounds in weight.

NOTES OF EVIDENCE OBTAINED BY BUREAU OF MINES.

Personnel: March 16 and 17 investigations were conducted inside the Layland mine by Chief Mine Inspector Earl Henry and District Inspectors Holliday, Cobb, Absalom, Murray and Lambert. The company was represented by General Superintendent Bertolet, Supt. Knerr and Company Inspector Muir. The Bureau of Mines was represented by J. W. Paul, D. J. Parker, H. D. Jones, and R. H. Seip. Samples of coal, dust, and air were obtained throughout the mine and complete data obtained. Parker also obtained data on the Greenwood and Hemlock mines near Layland.

Extent of Explosion: From all evidence obtainable the explosive forces extended over the major portion of the mine. The forces extended along the Tunnel entries throughout their entire length (5600 feet); on the No. 4 Main entries from the 6th Lefts out to the Tunnel

entries (2500 feet) and on the No. 3 Mains from the 8th Lefts to the drift mouth (4800 feet).

The portions not effected by the explosion were the No. 4 Mains inby the 6th Lefts, including the 7th and 8th Lefts off the 4th Mains; and the No. 3 Mains inby the 8th Lefts, including the 9th, 10th, 11th and 12th Lefts from which entries 47 men escaped from No. 3 Mine after four days' entombment.

From No. 4 Mine the explosive forces traveled through the 6th Left entries (see map) across onto the No. 3 Mains and thence expanded in both inby and outby directions. If this connection between No. 3 and No. 4 Mines had not existed, it is very probable that the 35 men, who were killed in No. 3 Mine, would have escaped.

The large area of standing water in the 6th Left tended to cool the explosive wave and lessen its violence.

Large areas for expansion were afforded the explosive forces as they passed through the 6th Left into the rooms broken through onto the 5th and 7th Lefts. (see map)

The loaded motor trip standing inby 8th Left was wrecked by the explosion wave traveling inby along the No. 3 Mains and effectually blocked its further progress.

These several factors were all of much importance in the failure of the explosive forces to pass beyond the 8th Lefts inby the No. 3 Mains, which so fortunately resulted in the saving of 47 lives.

DETAILS OF EVIDENCE, ENTRY BY ENTRY. (See Rectangles A, B, C.)

Tunnel Entries: The overcast at the junction of the Tunnel entries and No. 3 Mains was partially wrecked. The top was blown off, the I beams supporting the concrete were bent up at their outer ends about 3 feet, and the broken slabs of concrete had fallen immediately below. (See sketch D).

Excepting at the overcasts, the track and trolley wire in the Tunnel haulageway were not disturbed, but the rock stoppings had been blown out onto the aircourse side. (see map)

There was little evidence of violence along the Tunnel aircourse, which was very wet in places and bottom covered with broken slate, giving the explosive flame no coal dust to feed upon. As a result, the fan at the outby end of the aircourse was little damaged, the main force of the explosion coming out of the drift mouth of No. 3 Haulageway.

At the junction of the Tunnel entries and the No. 4 Mains two concrete overcasts were blown down. (See sketch E) The overcast in the Main Tunnel Haulageway had one wall standing on the aircourse side, the other wall was blown toward the No. 4 Mine and the top was blown outby sufficiently to almost close the entry with its debris. (See sketch E)

The overcast on the right parallel had both walls and the top blown down towards the No. 4 Mine, one wall lying on the track of the Main Tunnel and the other in the mouth of No. 4 Aircourse. Pieces of concrete from the top were blown inby the No. 4 Aircourse for 50 feet.

Inby along the Tunnel Haulageway beyond No. 4 Mine there was

little disturbance excepting the destruction of all rock stoppings which had been blown to the aircourse side.

On the Tunnel Haulageway (See sketch "E") near the junction with No. 4 Mine was a trip of 9 loaded cars on the track. On the inby end of the inner car was some debris. The mechanical forces apparently equalized at this point, therefore this trip of cars was not disturbed.

A road dust sample was collected 75 feet outby the slant to the No. 4 Mine on the Tunnel Haulageway, the material there being strongly packed in the middle of the track and was scraped loose by the heel of the shoe over a distance of 50 feet. Sample can No. 24344.

Twenty feet inby the slant to No. 3 Left on the Tunnel Haulageway was a piece of sheet iron, a part of the 6-ton haulage motor, which stood on the Tunnel Haulageway between the first and second crosscut beyond the 3th Left slant.

On the right rib near the 4th Left slant on the Tunnel Haulageway was a small pile of debris. Between the fourth and fifth crosscuts inby the 4th Left slant was a piece of sheet iron 18" x 24" blown from the 6-ton motor, which stood in the Tunnel haulageway between the first and second crosscuts beyond the 5th Left slant.

Just outby the No. 5 Mine cut off on the Tunnel Haulageway opposite a cross cut was a pile of debris on the right rib. At the mouth of the 5th Left slant was a piece of sheet iron 18" x 24" blown from the 6-ton motor. A piece of sheet iron was jammed between the motor and the

left rib bent outby in the middle, thus).

The headlight on the inby end of the motor was filled with dirt. The trolley pole on the left side of the motor was missing, the trolley pole socket being found 30 feet outby. The trolley pole on the right side of the motor was held down under its stirrup.

Substation on Tunnel Haulageway - (See Sketch "F"): The substation on the Tunnel Haulageway is located 600 feet inby the junction with No. 4 Mine and is enclosed in an excavation 14 feet by 18 feet made in the coal on the right rib.

The high tension 2200 volts A. C. wire enters this station through a bore hole from the surface.

The equipment consists of an Alis Chalmers Company direct connected transformer furnishing D. C. current at 250 volts, a switch board, oil switch and a small transformer unit.

The masonry wall at the entrance was intact but the two ^{latticed} iron doors, which had hung on trolley wheels, were blown from their supporting track, one being found on the track in front of the station and the other 50 feet outby.

The concrete back wall of the station had been blown out, the result of a partial vacuum, which allowed the rear end of the steel roof beams to drop, thus permitting the concrete roof to fall in the rear of the station. The right rib wall had been forced against the coal rib. A dust sample was collected from the ribs and exposures inside the substation, the dust being very fine. Sample can No. 24292.

Two bodies were found inside the sub-station, John H. Smith and John Atkinson both badly burned and with broken limbs. They had been killed by the explosion before they could move outside of the station.

No. 5 Mine off Tunnels: In front of No. 1 Room mouth was a pool of water, at the mouth of No. 2 Room were three empty cars, two on the cut off and the 3rd partly in the mouth of the room. Mud was blown against the outby ends of the cars, and against the outby faces of the wheels of the second car. Beyond room 2 the conditions were normal. These entries and 3 rooms in this so-called No. 5 Mine were not working.

On the Tunnel Haulageway between the No. 5 Left cutoff and slant was a piece of canvas caught on a trolley hanger and the ends trailed outby, showing that the last force here had been outby. In the first slant inby the 5th Left slant were 4 empty cars, the outer car being off the track and the outby ends of the cars ~~broken~~ bent inby.

Faces of Tunnel Entries: At the face of the haulage entry, the upper coal had been mined next to the roof and bodies 35 and 36 both badly burned were found in the cutting. No loose coal was at the face.

The track had been blown apart and the ties were bunched by outward force just opposite the last crosscut 20 feet from the face. Coke and soot was found on the right rib and the fade, also coking on the left rib just inby the crosscut. ~~It~~ In the last crosscut coke was

found on both roof and bottom.

A road dust sample (scoop) was taken at the mouth of the last crosscut. Can No. 24352.

The face of the Tunnel Aircourse had no loose coal but had been mined in the top coal. A loaded car was off the track 15 feet from the face, the outer end of the car being bent inby and having coke on the outer end and on the coal in the car, and the right side of the car was broken outward. Coke and soot was found on the right rib from the last crosscut to the face. Bodies 33 and 34 were found against the face just below the mining, both being badly burned and with fractured limbs. No gas cap on safety lamp at faces, but air samples were secured two inches from the top at the face of the aircourse.

5th Lefts off Tunnels: The track inby the 5th Left entry was shifted both to the right and to the left. An empty car in the first slant had the outby endgate turned back over the car.

At the last crosscut the track was shifted against the left rib. At the face of the 5th Left entry an empty car was off the track against a top "brushing", the outer end of the car bent inby. A coal shot from the right rib had apparently blown against this car. Coke and soot were found on the left rib opposite the car.

In the 5th Left Aircourse no coal was down, Coke and soot were found on the right and left ribs 10 feet from the face.

4th Lefts off Tunnels: Debris was blown out of the 4th Left Aircourse against the right rib of the Tunnel Aircourse. From the face

of the 4th Left Airdcourse back for 150 feet heavy soot filaments were deposited on roof and ribs with granular coke under the soot. The roof slate was shot down at the face. No gas cap was found at the face, but an air sample was taken near the top.

No. 4th Left Entry:

Room No. 1. Worked out and abandoned.

Room No. 2. A car one-half loaded was on the track 100 feet inby, having coke on the inby end, also on roof above car. A fall across the room at the inby end of the car.

Room No. 3. In room mouth an empty car was on the track and a loaded car was found 20 feet from the face under a fall of top. No gas found at face. At mouth of No. 3 Room on the entry was an empty car with inner end bent inby.

On the entry, just inby the last open slant, there were three empty cars undisturbed, the face of the entry being 100 feet beyond this open slant. Twenty feet back from the face a new slant was driven in for a distance of 30 feet; coking on the left rib 10 feet from this face. Opposite the mouth of this new slant the right hand rail on the entry had been broken and bent towards the left rib by a force apparently coming out of this new slant. At the face of this new slant, the slate was shot down with a car of slate 1/5 loaded off the track and against the slate. On the right rib and bottom 10 feet from the face was found granular coke covered with soot.

3rd Lefts off Tunnels: Near the face of the 3rd Left Air-

course (see sketch "G") the track had been displaced, but on the entry the track had not been disturbed. The only evidence of violence along the 3rd Left entry was the destruction of all the plank stoppings, which were blown towards the Aircourse.

A loaded car was standing on the track in the slant near the face of the aircourse, the inner end of the car being in line with the left rib of the Aircourse. From this car to the face of the Aircourse the track was destroyed, the ties and rails being scattered but not moved inby or outby. At the face was a pool of water 8 to 10 inches deep, and on the ~~left~~ right rib 5 feet from the face was a barrel full of water. Two bodies were found nearby Nos. 16 and 17, both badly burned, and the latter with the head partly blown off, the right arm broken, and the left leg broken.

The jaws and front of the face were mutilated as though by the explosion of a detonating cap held between the teeth. On the left rib about one foot from the bottom was a drill hole, which extended through the rib into a small cavity in the 3rd Left entry. Both ends of this drill hole were open, but it had been drilled from the Aircourse side. (See sketch "G".)

The face of the 3rd Left entry was driven 100 feet beyond this slant leading to the Aircourse. There was a loaded car near the face of the entry, surrounded with water extending above the wheels and for a distance of 30 feet back from the face.

At a point 65 feet inby the slant was the opening from the drill

put through from the Aircourse side and five feet outby this hole stood a water barrel one quarter full and undisturbed. The bottom was damp and plastic for a distance of 30 feet back from the edge of the standing water. (See sketch "G").

Rooms off 3rd Left Entry:

Room 1 - No track, abandoned.

Room 2 - Conditions normal. Between rooms 2 and 3 on the entry an empty car was off the track.

Room 3 - Track displaced and coke on room.

Room 4 - No track, worked from room 3.

Room 5 - Fallen in at mouth and abandoned.

Room 6 - Working, fall ten feet inby.

Room 7 - No track, heavy fall at face.

Room 8 - Fall ten feet inby, empty car on the track just inby the mouth of room 8 on entry.

Room 9 - No track, fall at mouth, worked from room 8.

Room 10 - No track, fallen almost full length.

Room 11 - Normal conditions.

At the first crosscut inby Room 11 the last force had apparently come from the Aircourse side, there being two pieces of boards at the outer rib of the crosscut and a small pile of debris against the left rib of the entry. Just inby this crosscut were two empty cars off the track, the outer car having the inby end bent outby. The next crosscut was a slant through

which the track led into the face of the Aircourse.

No. 2 Lefts and No. 1 Lefts off the Tunnels were not working, and were apparently undisturbed.

NO. 4 MINE.

NO. 4 Main Entry (Haulageway): On the No. 4 Haulageway between the second and third crosscuts inby the Tunnels was a motor attached to nine loaded cars all on the track. The sheet iron on top of the motor was resting on top of the first loaded car. A sample of road dust was procured between these loaded cars and the left rib for a distance of 50 feet. Can No. 23362. Three bodies were found near this trip, all badly burned and two with crushed skulls, having all been caught instantaneously by the force of the explosion.

Inby along No. 4 Haulageway as far as the slant to the 5th Left, the track was not disturbed at any point. The trolley was intact, excepting opposite No. 5 Left slant and for a distance of 300 feet outby where it had been thrown down along the track.

Charred dust and coke were in evidence along this Haulageway from a point midway between the Tunnels and the 2nd Left slant to the second crosscut outby the 5th Left slant. Between the Tunnels and the 7th Left slant along the Haulageway all but 8 stoppings had been destroyed. Inby the 7th Left conditions were normal and all stoppings were intact.

At the slant to 5th Left and opposite the opening into 6th Left

off No. 3 Mine (see map) road dust samples were taken across the entry from rib to rib for the determination of the presence of coke. Samples in envelopes. Also procured road dust grab samples 150 feet in by 5th Left for a distance of 100 feet along the No. 4 Haulageway. Can No. 23358.

Along the right rib near the opening into 6th Left off No. 3 Main was a portion of a door, presumably blown from the slant leading into No. 5 Left.

On the Haulageway at points 20 feet, 120 feet and 200 feet in by the opening to 6th Left off No. 3 were three large pieces of shale each about 100 pounds in weight and all apparently blown in by along No. 4 Haulageway, as the roof in this vicinity was smooth and there were no cavities therein nearer than 300 feet out by this point.

The door in the slant leading into 7th Left was intact, but 20 feet in by along the Haulageway was a piece of concrete about 75 pounds in weight.

3rd Lefts off No. 4 Mains: The 3rd Lefts were advanced on the rise for a distance of 1500 feet with six rooms near the top end, which were not working. The stoppings were blown out in the first eight cross-cuts apparently towards the Aircourse side and the trolley wire was partly down for a distance of 200 feet in by No. 4 Main entry.

4th Lefts off No. 4 Mains: Against the left hand corner of the rib at the junction of 4th Left slant and 4th Left Aircourse a steel car was turned upside down and thrown violently against the corner of the rib with a small fall of roof partially covering the car. The doors

in 4th Left Slant and on the Aircourse between 4th Left Aircourse and Entry were missing.

Large pieces of shale were thrown out from the 4th Left entry upon the Main Aircourse, also further inby on the entry large portions of rock had been thrown about with great force.

In the mouth of Room 1 off 4th Left were three empty cars, the middle one off the track, and the ends of the two outer cars bent outby.

On the entry opposite the mouth of No. 3 Room debris had come out of the room and piled up against an empty car on the entry. Attached to this car inby was a second car badly wrecked apparently by forces traveling outby on the entry.

Just outby of Room 4 an empty car had been thrown against the left rib and its outby end was missing entirely.

On the entry opposite Room 4 an empty car was blown lengthwise across the track and the end facing Room 4 was forced in.

Further up the entry coking was found in Room necks 8 and 9, a heavy fall between Rooms 10 and 11 and soot filaments in a crosscut inby Room 12, also heavy coking in crosscuts inby Rooms 14 and 15. The entry was very dry and dusty in this section, and all stoppings had apparently been blown towards the Aircourse side.

Coking was found in Room necks 15, 16, 17 and 18 and soot on all exposures along the entry from Room 19 to Room 15.

Opposite Room 20 timbers and debris had been blown into the Room

neck and the entry from the Aircourse side.

A gas cap was found over a fall in the crosscut just outby No. 21 Room neck and there was no air moving at this point and a strong "afterdamp" odor. The evidence pointed strongly to an ignition of gas in this vicinity. Four bodies were found on 4th Left entry.

5th Left off No. 4 Mains: The last force was apparently inby into the slant leading off No. 4 Main Haulageway to 5th Left entry, as the trolley wire off the No. 4 Main had been forced up into this slant, and the door therein had been blown inby against the Aircourse rib (see map).

Inby No. 5 Left entry the first three stoppings were apparently blown through onto the Aircourse side also the fifth, seventh, and eighth stoppings, while the fourth and sixth stoppings had seemingly been blown through onto the entry side.

There was evidence of considerable violence along the No. 4 Left entry inby as far as No. 9 Room neck, the force coming very evidently from the direction of No. 4 Left Aircourse, which was connected through to No. 5 Left entry by No. 6 Room (see map).

Inby Room 9 the **entry** was blocked by a heavy fall of top and the faces had not been working.

Four bodies were found on No. 5 Left entry, one each in Rooms 1, 2 and 6 and two bodies out on the No. 4 Main Aircourse, where they had apparently been blown outby with great violence from No. 5 Left entry.

All these nine bodies were badly burned and showed evidences of violence.

The cars and other material along No. 5 Left entry also indicated that violent forces had passed outby along the entry.

A motor attached to three cars sttd at No. 5 Room mouth, and from the top of the motor a heavy piece of sheet iron had been blown outby 40 feet. Opposite room 6 was a large pile of debris, and inby on the entry stood three empty cars, the inner car having its inby end crushed in.

Timbers, debris and five large pieces of rock had been hurled from Room 7 out onto the Entry and a car of props was derailed in the mouth of Room 8.

Thence the forces had traveled inby derailing three empty steel cars opposite No. 9 Room neck and crushing their outby ends inby.

Coking and evidences of flame were found in Rooms 5, 6, 7 and along the entry.

6th Left off No. 4 Mains: In 6th Left entry were found evidence of violence, as well as flame, although the force shows was not as strong as evidenced in No. 5 Left.

Charred dust and coke were found at No. 4 Main Aircourse, in the four room necks off No. 6 Left entry and on the props and in the crosscuts inby the entry, also soot in places.

At the mouth of No. 6 Left the door had apparently been blown outby against the rib of No. 4 Main Haulageway, and the brattice on the

No. 4 Aircourse between No. 6 Left entry and Aircourse was apparently blown inby.

There was an open slant one crosscut back from the face, the track extending through this slant into the Aircourse, where a loaded trip of four cars was standing on the track. On the entry opposite the slant, the track was broken and the inby rails blown 3 inches towards the Aircourse (see map).

7th Left off No. 4 Mains: The door in the slant leading to 7th Left was intact and standing open 12 inches being held by dirt. The door in the first slant leading from 7th Left to the Aircourse was intact but standing partly open. The wooden stoppings were undisturbed, and conditions normal inby the entry.

No. 3 Main Haulage Entry: At the drift mouth was a heavy fall of top, the forces having been sufficient to push forward a dozen sets of upright timbers and raise the cross timbers at the pit-mouth, thus allowing the loose earth above to fall and partially blocked the pit-mouth, this fall being about 12 feet in height and 20 feet in length. The stone arch at the drift mouth was blown down but the stones were only thrown a few feet from their original position.

At a point 200 feet inby several sets of timbers and collars were blown down causing a large fall of roof which covered both tracks to a depth of from three to six feet.

All stone stoppings to the left on No. 3 Main Haulage were destroyed from the drift mouth to the 4th Left excepting one stopping in the first crosscut outby the 4th left.

Just outby the slant to 5th Left on the right was a side track leading into the third parallel used as a passage for cars. Opposite this on the 3rd Main were two empty steel cars wrecked and off the track towards the right rib, and just inside this ~~parallel~~ parallel were three empty cars badly broken and twisted. The trolley was also down for over one hundred feet along the Main Haulage at this point.

All stoppings were out or partially out to the first crosscut outby the 7th Left.

The trolley was down in the slant leading into 6th Left, and the door missing.

Just inby 7th Left is a side track to the right run-around on which were ~~ten~~⁴ loaded cars, the outer car being in line with the right rib of the Main Haulage. Coke was found on the outby end of the outer car and on the inby exposures of the ribs in the run-around also coke on the coal in the cars and on the inby ends of the cars. Coke and coke blisters were found on the left rib of the Main Haulage here, and soot filaments on the ribs near the cars. A sample of bright coke collected from the ribs in the run-around, can No. 24671. The next inby crosscut to the right had coke on ribs near the Main Haulage.

For a distance of 200 feet inby 7th Left the bottom had been taken up giving a height of 10 feet along the Main Haulage. The bottom was dry and dusty with some coking along the left rib. A road dust sample was taken at this point, can No. 24672, to be tested for coke,

inflammability and ash.

At the third crosscut inby 7th Left, coke was found on the ribs.

At the slant to 8th Left, no coke was in evidence. At a point 25 feet inby, there were three empty cars with the outer ends of the first two bent inby. Opposite the first crosscut inby, there are two empty cars in front of a six-ton motor to which are attached nine loaded cars. The outer end of the first empty is forced inby and body No. 69 lay with the head crushed against the outby end of this car. Seven other bodies were found in the vicinity of this trip, Nos. 65, 66, 67, 68, 70, 71 and 83.

The first six loaded cars were on the track and the last three **thrown** sideways across the entry and against the left rib. The Main Haulage was rather narrow and low at this point and the jamming together of this trip practically blocked the entry at this point, and thus served to protect the inby workings from the force of the explosion, as heretofore described in this report (see map).

The stopping in the second crosscut inby 8th Left was blown onto the Main Haulage.

Inby the wrecked trip at 8th Left, little disturbance was noted along the No. 3 Main Haulageway excepting at a point 200 feet inby of 9th Left where the right rail was covered with dirt for 50 feet.

In the slant to the 9th Left the door was intact and near the Main Haulage was a brattice board 12 inches wide and 8 inches long upon which was ~~was~~ written in Italian a message, which is translated into English as follows:

"4-1915, 9 Left, 5 men in here in 9 Left. Want help, help."

This was the message written by Salvitori Morici, who escaped from 9th Left with his four comrades on Saturday morning March 6th, as described previously in this report.

The ~~slant into~~ ^{Main Aircourse at} 9th Left passes under an overcast which was undisturbed. Across this slant and ^{near} the Main Haulage, a road dust sample was collected, can No. 24596. Just inby 9th Left entry was a pool of water covering the track. The 9th and 10th Lefts were practically unaffected by the explosion, so that the entries off No. 3 Mains which were effected, 5th, 6th, 7th and 8th Lefts will now be described.

5th Lefts off No. 3 Mains: There was no overcast at the mouth of the 5th Left. The doors were blown inby against the left rib of No. 3 Main Aircourse, in which was a standing pool of water just outby 5th Left.

Opposite the first slant leading from the 5th Left to the Aircourse a half dozen T rails had been thrown about the entry. The door in the slant was blown down but not broken. Room 1 is turned off the 5th Left entry at a point 75 feet inby this first slant. The bottom along the entry was damp and muddy, and mud had been blown against the outby exposures. For a distance of 600 feet inby all the trolley hangers had mud plastered against their outby exposures. A sample of this mud was taken in Can No. 23360 for a test of moisture and ash. The trolley wire terminated at Room 13, and ten feet inby an empty car was partially filled by a small fall of roof, the roof having fallen heavily inby along

the entry, the pillars having apparently been drawn. A road dust sample was taken opposite Room 11. One body No. 4 was recovered from near the mouth of this No. 5 Left on the day of the explosion, but none were afterward found therein.

6th Lefts off No. 3 Mains: There was no overcast at the 6th Left. These entries had been abandoned and contained much standing water. No. 6 Left connected through onto No. 4 Main Haulageway (see map) and through this connection the explosion traveled across to No. 3 Mine, the damp condition of the 6th Lefts undoubtedly reducing the heat and violence appreciably. Three bodies were found on the 6th Left entry 86, 87 and 88, all these men had their dinner buckets with them and had been suffocated. They may have gone into the 6th Left hoping to escape in that way. All were foreigners.

7th Lefts off No. 3 Mains: There was no overcast at the mouth of the 7th Left. The doors were destroyed and blown inby. In the No. 3 Main Aircourse at the 7th Left, the debris indicated the last movement of forces as inby. Air was found coming out of the 7th Left entry and measured 9,000 cubic feet, and air samples were taken at this point.

6th Left At the first slant to the right inby the 6th Left entry the door was missing and twenty-five T rails were thrown about on the entry, where they had probably been stored prior to the explosion. The roadway was dry and dusty. At the third crosscut inby, the floor had been swept clean of all coarse material and a quarter inch deposit of fine dust had accumulated. A dust sample was taken at this point, Can No. 24520.

7th Left

The next inby crosscut, just outby of Room 3, coke was found on both ribs of the crosscut, and the wood stopping was partly out towards the entry. The next two crosscuts were also coked on the outby rib.

Room 7 was full of water and Room 8 contained water for 50 feet inby, but the entry was dry.

Inby Room 8 coke was found on the inby rib of the slant on outby exposures. On the Left entry rib inby Room 9 coke was found on inby exposures.

Between Rooms 9 and 10 on the entry was found a motor on the track with the glass on inby headlight covered with dust. Coke was found on the outby rib of the crosscut outby Room 10.

Beyond Room 10 coking was not noted. Six bodies were recovered from the 7th Left entry some showing slight burns.

8th Lefts off No. 3 Mains: There was no overcast at the 8th Left.

The door in the slant heading from No. 3 Main Haulageway into 8th Left was destroyed and blown 10 feet inby.

The wooden stoppings along 8th Left entry were blown into the Aircourse.

Opposite room 10 a road dust sample was taken. No heat was strongly evidenced on this entry, nor any disturbance of track or materials. Ten bodies were found on 8th Left, and most of these men had apparently been overcome by "afterdamp".

The connections between the 5th, 6th, 7th and 8th Lefts permitted the explosive wave to spread rapidly throughout these workings. Between the 8th and 9th Lefts there was no connection, nor between the 9th and 10th Lefts.

DESCRIPTION OF THE BRATTICES BUILT BY THE ENTOMBED MINERS.

Brattices built in 9th Left off No. 3 Mains: (See sketch "H")

When Salvatori Morici and his five comrades, (one of whom died on the first day) were caught in 9th Left by the explosion and found they could not make their escape out No. 3 Main entry, they decided to brattice themselves in near the face of 9th Left and remain there until the "after damp" on the No. 3 Main entry had become sufficiently diluted to permit their escape. This proved a very judicious plan on the part of these foreign miners, as 9th Left was undisturbed by the explosion, and the air remained good therein for four days until these five men finally made their escape on the morning of March 6th. The 9th Left entries are advanced for a distance of 1800 feet off the No. 3 Mains and there is a "rise" averaging three per cent going up into the 9th Lefts, another fortunate circumstance for these entombed miners, since the heavy "after-damp" could not ^{so readily} back up into these entries. ~~without pressure behind it~~

The first precaution taken by Morici and his comrades was to remove three boards from the wooden stopping in the first slant inby between the 9th Left entry and Aircourse, thus "short circuiting" the air. Then the canvas door in the slant just outby Room 27 was removed as an

extra precaution. Two board stoppings were then constructed on the 9th Left entry, the outer stopping at room neck 27, (just inby the slant from which the canvas door had been removed) and the inner stopping 200 feet inby and about 200 feet from the face of 9th Left. (See sketch "H").

Two tight board stoppings were then built in the two crosscuts enclosed by these two brattices on the 9th Left entry, and all of these four board stoppings were made tight by packing coal dust against the bottom and sides and packing brattice cloth into the cracks between the boards. This gave these five miners a space 200 feet long, 12 feet wide and 5 feet high, in which they had an excellent air supply for their four day's imprisonment, also a sufficient food and drink supply, as they had thoughtfully collected twenty dinner buckets from the rooms along the 9th Left entry, and these buckets were all well filled, as they had been left by their owners early in the morning.

Morici and his comrades also constructed an improvised fan in their outer stopping by making an opening near the center and pushing through a board 20 feet in length and 10 inches wide to the ends of which they attached triangular shaped "wings" of brattice cloth. Sitting behind their brattices they could propel this board up and down "see-saw" fashion and thus render the stagnant air cooler, *but for no good purpose other than imaginary.* (See sketch "H").

Twice each day this party ventured out from behind their stopping and made a trip out the 9th Left to ascertain the condition of the air on the No. 3 Main entry, and it was not until Saturday morning March 6th that they

decided the air pure enough for them to escape; their judgment proved correct, and at 8:10 Saturday morning these five plucky miners came staggering out the drift mouth where they were met by J. W. Paul.

Although many others from the 9th Left entry had retreated to 10th Left and joined the larger party there of 42 men, Morici and his comrades knew nothing of this other party, nor whether there were other men alive in the mine.

The excellent judgment used by these five foreign miners in first short circuiting the air, by partially tearing down a wood brattice, and then retreating to the extreme upper end of their entries to build ~~stout~~ stout wooden brattices, is worthy of high praise and speaks well for the intelligence of these foreign miners. Their brattices were not as well constructed nor as air tight as those in the 10th Lefts, but it must be remembered that this party consisted of only five men, while the party in 10th Left consisted of 42 men.

The abundance of brattice boards, cloth and other material found in time of need by both parties and used for their own protection, indicates that the company was very liberal in the distribution of these very necessary supplies.

Brattices built in 10th Lefts off No. 3 Mains: (See sketch "I")

Following the concussion of the explosion the miners ran out from the 9th, 10th, 11th and 12th Lefts onto the No. 3 Main Haulageway to determine what the trouble was. There must have been a scene of great confusion for awhile, but when the various parties advanced as far as the wrecked motor

trip near 8th Left they encountered hot smoke and "afterdamp" and knew that an explosion had occurred.

Some men tried to penetrate this "afterdamp" and died in the attempt, while the cooler heads gradually collected the party of 42 men together and they all retreated to the 10th Left. Here they found the air good and determined to brattice themselves in until rescued, or until they could escape. From all accounts the Americans in the party took the lead in directing the work McMillan, Whalen, Derenge, Hensen and Fitzpatrick being among the leaders. Derenge had escaped from Eccles No. 6 Mine following the Eccles explosion April 28, 1914.

The first brattice work done (See sketch "I") was the opening of the door in the slant leading to the 10th Left from No. 3 Main Haulage-way to short circuit the air and the placing of a temporary wood stopping across the 10th Left entry about ten feet back from No. 3 Main Aircourse. (This was afterward removed).

At a point 125 feet inby from the Aircourse a substantial gob stopping was then built across the 10th Left entry. This stopping was 5 feet 10 inches high, 7 feet thick at the bottom, and 12 feet across and consisted of two walls of shale filled in with coal dust and dirt. The gob material was found close at hand for doing this work. Two hundred feet inby the first stopping a second stopping was constructed across the 10th Left entry substantially built of shale, coal and mine dirt, and being 6 feet high 8 feet thick at the bottom, 2 feet thick at the top, and 12 feet across (width of entry).

On the 10th Left Aircourse two similar stoppings had been built, (See sketch "I") the outer one 6 feet thick at the bottom, 4 feet high and 9 feet across; and the inner stopping, 6 feet thick at the bottom, 6 feet high and ten feet across.

The most favorable places were selected for the location of these stoppings and they were constructed in a most thorough and workmanlike manner, rendering them perfectly ~~air~~ air tight; so that the 42 men behind these stoppings were entirely shut off from the outside air.

On 10th Left entry the distance from the inside stopping to the face was 900 feet and in the Aircourse the distance was 850 feet, the average height for both entry and aircourse being 5 feet and width 12 feet, thus giving a total air content of 168,000 cubic feet for the 42 men imprisoned for four days.

The leaders of this party recognized the danger of the methane which might be generated in a closed air space of this character, and would not permit more than one carbide light to be lighted at a time, and this was kept down on the bottom. The Italian messenger sent out on Thursday afternoon, March 4th, to place the message on the switch at No. 3 Main Haulageway was not permitted to carry an open light, but was compelled to feel his way along the rail and trolley wire. The cool-headed, efficient, and courageous work done by these 42 men will go down in the annals of coal-mining. They again demonstrated to the world that the coal miner does not forget his training when the test comes. The many pathetic letters written by the entombed men showed that they had forgotten them-

selves entirely in their love and sorrow for their dear ones at home, and industrial America may well be proud of such proven sons as these.

BRIEF SUMMARY OF EVIDENCE AND PROBABLE CAUSE OF THE EXPLOSION.

The explosion occurred at 8:30 a.m., Tuesday morning, March 2, 1915, resulting in the death of 114 men inside the mine, and one man on the outside. Fifty-four men subsequently escaped alive from the mine, seven of them several hours after the explosion and forty-seven of them ninety-six hours after the explosion.

The explosion burst forth from the drift mouth of No. 3 Main Haulageway with great violence ^{and} ~~but~~ with much less ~~force~~ force from the mouth of No. 3 Main Aircourse at the fan house, resulting in little damage to the fan itself.

The range of the explosion extended over the major portion of the mine, the only parts not effected being the inby 1200 feet of the No. 4 Main entries and the inby 2000 feet of the No. 3 Main entries (see mine map).

The explosive wave traveled outby the Tunnel entries to the junction with the No. 3 Main entries, thence outby the No. 3 Main entries to the drift mouth, also across 6th Left from the No. 4 Main entries to the No. 3 Main entries. From the 4th Lefts off No. 4 Mains the forces apparently split three ways, traveling both outby and inby on the No. 4 Mains and through 6th Left towards No. 3 Main. From 6th Left on the No. 3 Mains the forces split and traveled inby to the wrecked motor trip at 8th Left and slightly beyond, also outby along the No. 3 Mains to the drift mouth.

Judging from this general distribution of forces, as well as from the detailed evidence found on the individual entries throughout the mine, the most probable source of the explosion appears to have been in the 4th Left entry off the No. 4 Mains.

The pressure apparently increased after the explosive wave advanced from the No. 4 Mains inby the Tunnel entries, this increased pressure being later responsible for the destruction of the two overcasts at the junction of No. 4 Mains with the Tunnel entries.

An accumulation of gas up the 4th Left entry off the No. 4 Mains was probably ignited by an open light, which resulted in the origin of an explosion, which attained greater pressure by the ignition of coaldust when passing outby through the No. 4 Main Haulage way and inby through the Tunnel Haulage way.

The decision reached at the Coroner's inquest was that the explosion had been originated by the "blown-through" shot near the face of the 3rd Left Aircourse off the Tunnels (See sketch G). However, it did not appear as though this shot had been fired at the time, as the bodies of two miners were found several feet from the mouth of this shot-hole. In the event of firing this shot these miners would not have been found in such proximity to their shot. The wet conditions in these 3rd Left entries adjacent to this shot likewise point to the fallacy of this theory, as well as other local evidence and the general evidence as to the distribution of forces throughout the mine.

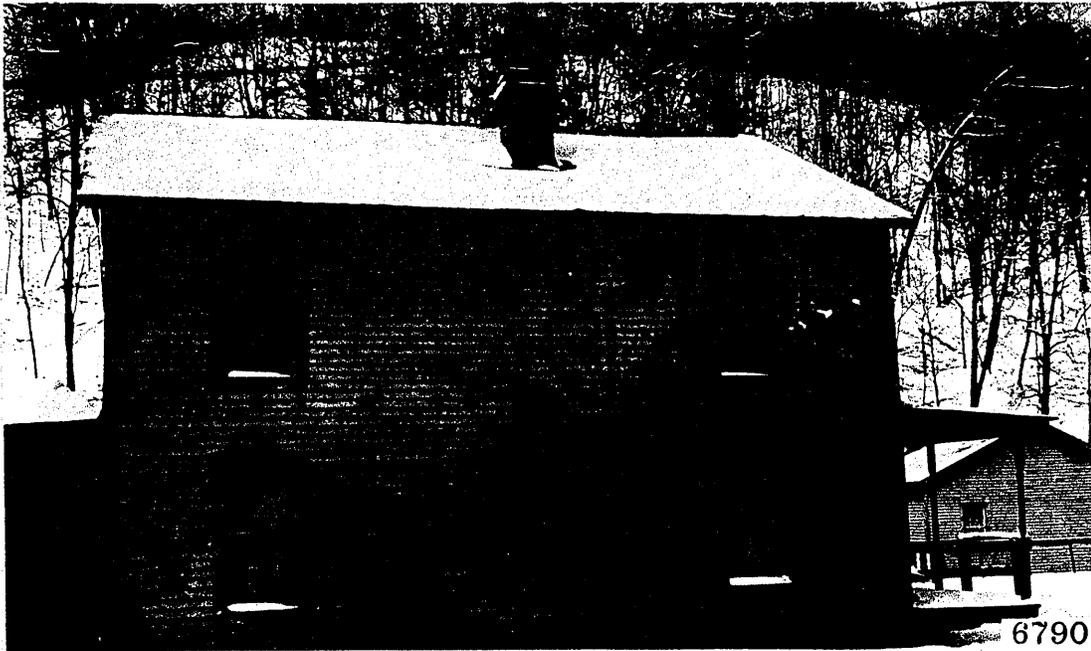
From testimony submitted at the inquest there were no trappers employed in the mine, and the motormen often allowed the doors to stand open after their loaded trips had passed out onto the Main entries. On the investigation of March 16 gas was found in 4th Left entry and it seems well within the range of probability that the failure to close a trap door on the evening previous to the explosion had permitted an accumulation of gas in the 4th Left entry which was ignited by an open light on the morning of March 2. No fire bosses were employed at the mine and the miners or day men upon entering working places had no means of knowing the conditions, therein, as no previous inspection had been made.

LESSONS TO BE LEARNED.

1. The opening and closing of ventilating doors should be rigidly systematized in all mines.
2. Fire bosses should be employed at all mines.
3. No mine should be considered non-gaseous, for the reason that dangerous accumulations of methane have never been discovered therein. Layland No. 3 Mine was considered one of the safest mines in West Virginia, with regard to gas, it is located high up in the mountains above water level, and no gas explosions have ever occurred in adjacent mines.
4. Coal dust accumulations must be removed or rendered inert in all mines to insure safety from explosions.
5. In the recovery operations following an explosion the hope of

finding live men should never be dismissed until all the workings have been ~~carefully~~ ^{fully} explored.

6. The efficient ~~work~~ work of the 47 miners, who saved their own lives by their prompt and effective building of brattices, is an object lesson to all engaged in the mining industry. A detailed description has been given of the construction of these emergency stoppings so that others may benefit by this knowledge.



Dwelling house 200 feet from drift-mouth, explosion blew out the windows, also some boards.

LAYLAND MINE EXPLOSION.

Summary of Men Escaped and Rescued.

7 men escaped from No.5 mine March 2, 1915.
5 men escaped from No.3 mine March 6, 1915.
42 men escaped from No.3 mine March 6, 1915.
Total . . 54 men escaped alive

Summary of Men Killed.

35 men killed in No. 3 mine.
41 men killed in No.4 mine.
38 men killed in Tunnel section.
1 man killed on outside.
Total . . 115 men killed.

28 men suffocated in No.3 mine.
16 men suffocated in No.4 mine.
Total . . 44 men suffocated.

7 men killed by violence or burns in No.3 mine.
25 men killed by violence or burns in No.4 mine.
38 men killed by violence or burns in Tunnel Section.
1 man killed by violence or burns on outside.
Total . . 71 men killed by violence or burns.
44 men killed by suffocation.
Total . . 115 men killed by violence, burns, and suffocation.

-100-



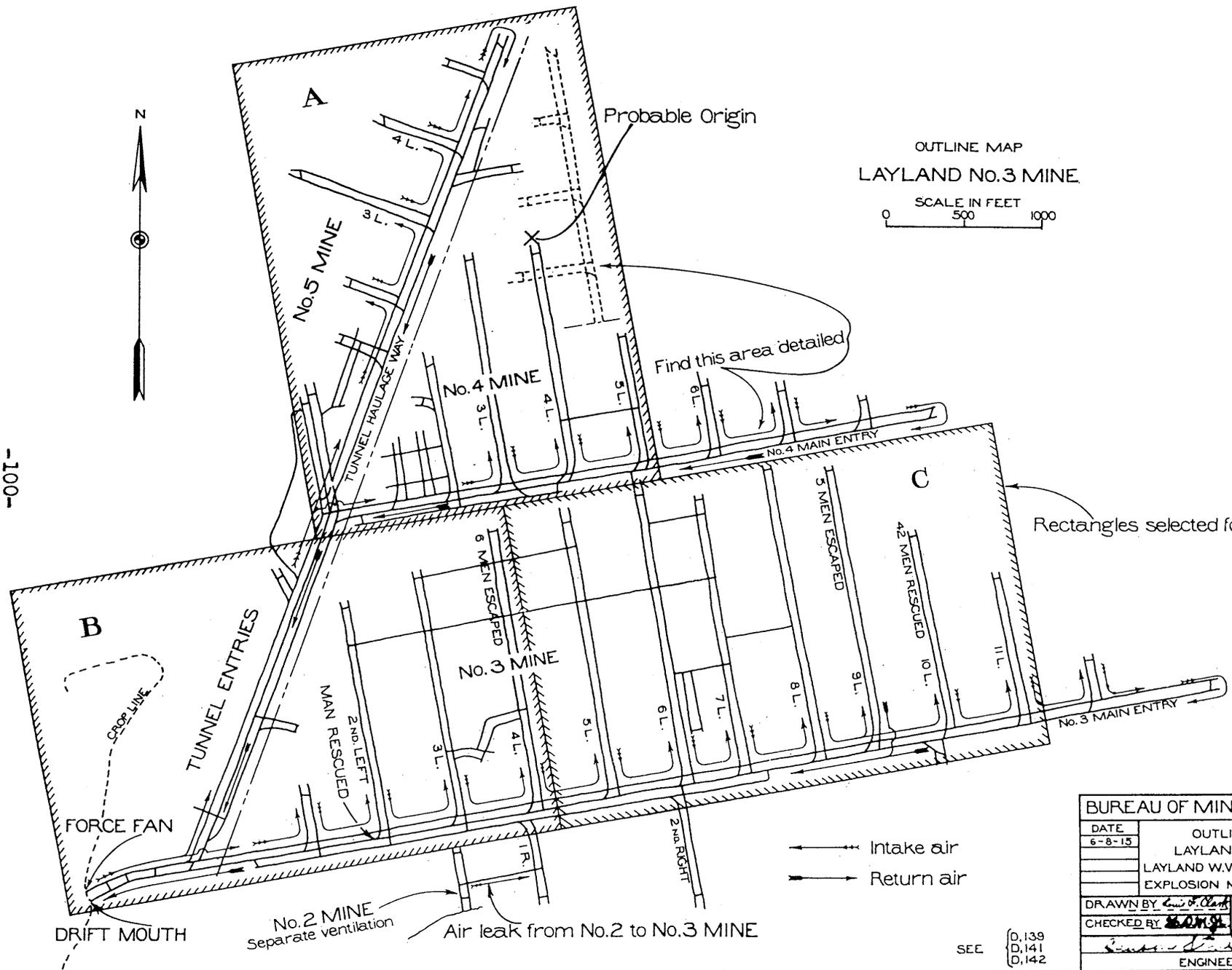
OUTLINE MAP
LAYLAND No.3 MINE

SCALE IN FEET
0 500 1000

Probable Origin

Find this area detailed

Rectangles selected for detail



Intake air
 Return air

BUREAU OF MINES; PITTSBURGH, PA.	
DATE 6-8-15	OUTLINE MAP LAYLAND No.3 MINE
	LAYLAND W.VA., FAYETTE COUNTY
	EXPLOSION MARCH 2 1915
DRAWN BY <i>W. O. Clark</i>	APPROVED
CHECKED BY <i>W. O. Clark</i>	<i>W. O. Clark</i>
SEE D. 139 D. 141 D. 142	ENGINEER B,461