The mine is generally damp except in one or two places which were referred by District Inspector J. A. Straughan, in the report of his inspection made March 3rd, 1909.

Notices of the Mining Department and the Instructions of the District Inspector in regard to the proper use of explosives, were posted at the pitmouth, but they seem to have been almost absolutely ignored, and the law flagrantly violated, in as much as several kegs of powder, some of them one-half to three-fourths full were found. And to this indifference to the instructions of the Department must this explosion, with its attendant loss of life, be attributed.

Attached herewith please find copy of a letter dated March 15th, 1909, from Mr. J. A. Straughan, District Mine Inspector to Mr. H. B. Beury, Supt. of Beury Bros. C. & C. Co., in regard to the use of explosives. Also attached please find copy of verdict of Coroner's jury.

LICK BRANCH MINE EXPLOSION.

Decembe 29 1908.

The Lick Branch mine is located in McDowell County on the main line of the Norfolk & Western Railroad, it is a drift mine opening on a small branch of Elkhorn River called Turkey Gap Branch, and is about midway between Bluefield and Welch.

This mine is owned by the Pocahontas Consolidated Collieries Company, with principal offices at Bramwell, West Virginia, Mr. Isaac Mann, of Bramwell is President, James Ellwood Jones, of Switchback, General Manager, Geo. E. Atkinson, General Inside Superintendent, and Cleve Bowers, Mine Foreman.

This mine is developed by two main headings running parallel to each other and about 2000 ft. apart. The left of New Main Entry is worked on the double entry system, and the Old Main or Turkey Gap entries are worked on the double entry system until they break through to Tug River, then they are worked on the three entry system. all of which are shown on the accompanying map. The mine has a producing capacity of 3000 tons daily, but on account of the general depression of business only 800 to 1000 tons daily were being mined.

The last inspection of the mine, made by this Department previous to the explosion of December 29th, is a matter of record and is presented in the evidence of the inquest and reads as follows:

Ventilation	*Good.*
Drainage	O. K.
Timbering	O. K.
Machineries	O. K.
Gases	*None.*
Oil used	O. K.
General Safety	O. K.
Recommendations	*None.*

The coal mined here is the number three Pocahontas seam, and has an average thickness of 8½ feet of clean coal (a very remarkable feature of the seam). In addition to this it has a most excellent roof, practically no props or timber being used in this mine, other than for mine ties; The mine is perfectly free of explosive gas of any kind and is worked throughout with open lights, it is ventilated by a 28 foot Homemade fan and is operated by a 100 Horse Power General Electric Generator, this gives a producing capacity of approximately 100,000 cubic feet of air per minute with a three inch water gauge; but it has a capacity of a much greater producing quantity of air needed.

The air is conducted into the mine in two splits, one intake being at the new main entry of left mine, the other intake being at what is known as Tug River opening.

The air taken into the New Main is conducted through all the left hand workings of said mine, then up to the face of the New Main entry, and back to the third right, and connects with number ten entry from the old main and there joins with the current taken from the Tug River side.

The air from the right hand workings is taken in at the Tug River openings, and conducted up all of the right hand workings of the old mine, distributed through the face and back through all of these workings, and connects with a current from the New Main at the heading of number ten entry, both currents flow back from that point to No. 9 and No. 8 entries, and return down the old main air course to fan.

The stoppings used in this mine are walls built of slate and rock about 8 ft. thick, and on the entry side are neatly trimmed and laid in mortar of sand and cement; this makes a very good system of brattices, and very little air is lost in transit.

The mine is equipped throughout with electricty and Electric machinery of all kinds, such as Mining Machines, coal loaders, Gathering Locomotives, etc., and is in many respects a very up to date mine.

The coal is delivered to the tipple by a tram road about one mile from the drift mouth. The tipple has a storage capacity of 500 tons of R. O. M. coal, and an adjoining bin with an equal capacity for slack coal which is used in the coke ovens, there are 192 ovens at this plant all of which weer in blast at time of accident, and which produced a very superior quality of coke.

The coal is mined here both by machine and pick method, and the miner is paid by the car instead of the tonnage basis.

At 4 P. M. of December 29th a message reached this office from the District Mine Inspector D. R. Phillips stating there had been an explosion at Lick Branch mine, and that fifty lives had been lost. I had at that time Deputies Warner, Henry and Grady all working in the eleventh District, who went at once to the scene of the explosion and began to assist in the work of rescue under the direction of D. R. Phillips, who is in charge of that District, and they are to be congratulated, both for judgment ability and bravery, they did, to say the least,

heroic work and well, and by 7 o'clock P. M. of the 31st they had explored the entire mine and recovered a total of 49 bodies, one colored man being overlooked and was picked up next day by our party while making the final examination of the mine, in an endeavor to locate the point of origin of explosion and in this connection will only add that any points of origin that may be named by myself or any of the Deputies as the initial point will only be conjective and must not be considered as final proof, for in my judgment there were so many places that could have been the point of origin, that I would not attempt to specify any particular place.

The conditions as we found them were simply these. "The miners seemed to be getting all the cars they could load it being the holiday season and many of the men were not at work, and those who were in the mine were no doubt trying to get out as much coal as possible, and in their endeavor to do this were taking advantage of the situation and using every possible means at their command to produce coal. As proof of this in 75% of the working places in the mine, we found where both machine and pick miners had been shooting coal from the solid; although this was a strict violation of instructions from the District Mine Inspector, also of the regular mine rules posted at the mine. And it was proven at the Coroner's inquest that the Management had used every effort to stop this; But with a condition of this kind, when the height of coal is considered, and the number of tons than can be shot from the solid, particularly with experienced miners, I believe it is impossible to stop solid shooting; for some men rather than mine their coal, will drill their holes charge them with powder, then wait for an opportunity when the officials are busy in another part of the mine to go in and shoot them; thereby keeping the air in the mine continually pregnant with an explosive mixture of gases. This mixture is always at such a temperature that a blown out shot or a hole charged with too large a quantity of powder, would at once cause an explosion; especially in such a mine as this.

After we, with a party of experts had gone over the mine and failed to locate any particular point of origin I left Deputies D. R. Phillips and P. A. Grady at the mine and instructed them to go over it carefully and see if they could find, or determine any supposed true origin of the cause of said explosion and I attach herewith their reports.

While I agree with them that room No. 7 off second right entry "B" suggests itself very much as the point of origin, yet there were several other places that could have been the point of origin, and are just as sugestive. So long as men are permitted to do promiscuous shooting in this manner we may always expect explosions of this kind. In my judgment such practice is courting such catastrophes. As the cause of the explosion is defined in report of both Phillips and Grady, I shall not here repeat; as their report is in a large measure in harmony with my own.

There is no doubt in my mind as to the principal cause of this ex-

plosion, which briefly is as follows: By careful inquiry I learned that a general practice in these mines, is for the miners to take a large quantity of dynamite in their powder flask under the pretense of it being powder, they also conceal fuse and dynamite caps on their person, and it is impossible for any foreman, however strict, to keep in touch with practices of this kind, as these are the most dangerous explosives. It matters not how well a mine is ventilated, or how perfectly the conditions are, so long as men are permitted to do their own shooting, these catastrophies can be expected at any time, and at any season of the year in any mine. This explosion is only one of the many we will have throughout the state unless this Department be given absolute authority to demand that men thoroughly familiar with explosives be placed in all mines of a dangerous character to be known as "Shot firers," and that all shooting must be done at times between shifts, when all the workmen are out of the mine except the "Shot firers."

I mention this method of shooting to bring to your attention the utter disregard that both experienced and inexperienced miners have for the orders of this Department and also for the rules as posted for the government and protection of all employers inside of a coal mine, the strength of a chain is its weakest link, so is every man's life who enters a mine under the conditions referred to, is at the mercy of the most reckless miner. Many operators of this state are pursuing the policy today of using shot firers, both for the protection of life and property, and in addition they are getting in return a much better preparation of coal. There is nothing to be lost either to the operators or miner by a system of this kind, but everything to be gained by each.

I enclose you herewith copy of testimony as given before Coroners inquest held at Switchback on Saturday, January 2nd, 1909. You will notice that none of the Mine Inspectors testified before this body, the reason for this was that we had not at that time determined any particular cause for the explosion, and any evidence that they might have given would have been theoretical rather than practical.

I have been asked by the Mine Investigating Committee to submit to that body what recommendations I could suggest to improve our mining conditions. There are many minor suggestions that I may take up, but the principal suggestions that I have to make are as follows:

1st. The Employment of "Shot Firers."

2nd. That all men in charge of the mines shall have a certificate of competency from the state before being permitted to hold such a position; by being drilled into the many dangers surrounding their calling, it will have much influence in carrying out the instructions of this Department. As it is now nine-tenths of the Mine Foremen throughout the state seem to think they are being paid to deceive the Mine Inspector and will if they hear of his presence (the Mine Inspec-

tor) being in the District, work all night to remedy conditions in the mine to have the Inspector report favorably. Then just as soon as the Inspector leaves will pay no attention whatever to the safety of the mine, nor to any instructions the Mine Inspector may have given him and at the same time will report to the Manager that the mine is O. K. By forcing examinations of this kind referred to, the state will secure a much more intelligent class of Foremen and will go far towards preventing mine accidents of all kinds.

In conclusion with reference to the Lick Branch mine and what is being done for its future safety, I will add, that this Company is installing a 4 inch water main throughout all of its principal headings and leading from this will be a 2 inch pipe into all rooms and chambers. A large tank on the hill will supply the water to this pipe and give a sixty pound pressure. By this system all dust and dry places will be thoroughly wetted and dampened; which will add very much to the safety of the mine, but will by no means make it safe unless other precautions are taken in a like manner.

As all names of the victims and etc., are contained in the evidence there is nothing further to be said. It might be of interest to know that this explosion was of a local nature and was confined principally to that part of the mine known as "Italy," which is composed of Dip A-1 entry, Dip B-1 entry, Dip B. entry, Old Main Entry 12 Cross entry, 11-2 entry and No. 11 Entry, all men who were in this part of the mine at the time of the explosion were killed; but the men escaped from all other parts of the mine practically unharmed after the explosion.

A very fortunate part of this catastrophe was that the fan was equipped with four large relief doors, and when the explosion occurred these doors flew open thereby taking practically all force from the fan consequently the fan never stopped running, and just as soon as a few brattices could be put up the air was at once put in motion around the mine and the work of rescue began by Deputies Phillips, Warner. Henry and Grady. who arrived at the mine 2 1-2 hours after the explosion. I herewith attach the report of the District Inspectors, Mr. D. R. Phillips, Mr. P. A. Grady and Mr. Earl A. Henry. Also a map showing the location of the bodies as found after the explosion.

Respectfully submitted.

JOHN LAING.
Chief of Dept. of Mines.

January 23rd, 1909.

The following is a copy of inquisition held relative to the explosion:

State of West Virginia. McDowell County, To-wit:

An inquisition taken at Switchback, W. Va., in the County of McDowell, on the 2nd day of January 1909, before C. W. White, Justice of said County upon a view of the bodies of:

Domnich Rose,	Zeff Estes,
Thomas Howell,	Thos. Blevins.
Peter Poles	Robert Williams,
John Hicks,	John A. Holland,
Thomas Swain,	Walter Reynolds,
Kemp Danders,	Joe Lockett,
Mathew Webber	Joe Nizuk
Luna Naumuk,	Richard Lockett,
Jim Smith,	Charles Little
John W. Miller,	Wiley Little,
John Brown,	J. E. Johnson,
George Parvolic,	Elzy Blevins,
David Bolin,	George Meaket,
Reed Abderson,	J. W. Edmondson,
Tony Palmara	John W. Partin,
Joe Edmunds,	James Calloway,
Green Davis	(Known as Holland),
Aseny Parvolic,	Scott Page.
Cleve Alexander,	Jim Roan,
Buck Williams	Karl Tarrachuk,
Gregory Boresky,	Tobe Webber,
Pleas Cannaday,	Jim Lockett
Samuel Beatty,	Trofin Harasmuk,
Pinus Buschuke,	Nicolay Buschuke.

Ab. Holland.

And also upon the bodies of two unknown there lying dead.

The jurors sworn to inquire when, how and by what means said persons came to their death, upon their oath do say:

We find that the persons known, and unknown aforesaid came to their death by an explosion in the Lick Branch Coal mine, near Switchback, in the County of McDowell, State of West Virginia, happening on Tuesday, the 29th day of December, 1908, in the afternoon thereof, and from causes unknown to your jurors.

We further find from the investigation that no blame for the deaths of the above persons can be attached in any sense to the Pocahontas Consolidated Collieries Company, Incorporated, or any of the officers of said Company.

In testimony whereof the said Justice and Jurors hereto set their hands.

(Signed) C. W. WHITE, J. P.
" E. D. CREASY, Juror.
" WM. BAILEY, "
" W. H. JACKSON, "
" J. L. WOOD, "
" LUTHER VERNON"
" S. J. PETERS, "

REPORT ON LICK BRANCH MINE EXPLOSION.

HON. JOHN LAING.

Chief of the Department of Mines.

Dear Sir:—In compliance with your instructions of January 2nd, 1909, that myself and Inspector P. A. Grady make a thorough investigation of the Lick Branch Mine, with a view of ascertaining, if possible, the cause of the disastrous explosion which occurred therein about 2:30 P. M., December 29th, 1908, whereby 50 persons lost their lives, we beg to submit the following report:

A superficial examination of the mine, made January 1st, 1909, by yourself, accompanied by Inspectors Earl Henry, Wm. Warner, P. A. Grady, D. R. Phillips and several officials of the Company, developed the fact that the explosion was confined to the Eleven 1, Eleven 2, No. 12, and the Dip Entries, the forces exhausting in the No. 9 Entry Pillars in one direction and through the Tug River Opening, and down the Old Main Entries in the other.

We began our investigation January 4th, 1909, and concluded it in the evening of January 5th, 1909. We first visited the dip workings, which consist of the Main Dip B Entries and the Dip A-1 and Dip B-1 Entries, which turn off to the right and left respectively from the Dip B Entry. We travelled from there to the Old Main Entry, No. 12, Eleven 1, and Eleven 2 Entries in the order named, returning again to the Dip workings for further investigation.

At the Junction of the Dip B Entry with the Main, we found a heavy switch tie moved outword about four feet at one end, and an examination of the sides showed that the forces had traveled outward. This was more or less plain along this entry to the intersection of the Dip A-1 Entry. We continued down this entry to the face, in the last room of which, we discovered such conditions as led us to the conclusion that this might have been the place in which the initial explosion had taken place. In order to make clear to you the manner in which we arrived at this conclusion, it is necessary to explain the method of driving the entry and Aircourse at this point, which method was entirely different to that employed elsewhere throughout the mine, and one which is certainly not to be commended in any mine.

The Rooms were turned to the left off the 1st Entry, which should have been the Air Course, according to general practice.

The Aircourse was maintained by driving a line of Break-throughs from one Room to the other, and in line with each other. This system necessitated the use of either doors or Brattice Cloth on each Room. There are four rooms driven on 120 ft. centers. The last room is driven several feet beyond the Break-through or so-called Aircourse. The first cut was being made directly in front of the Aircourse, as if to continue the same towards the next room. A shot had

been fired in the left side of this cut, the hole pointing directly into the Aircourse.

The shot was on tho solid and had simply cracked the coal from the hole downward, and was undoubtedly a windy shot, blowing out into the Aircourse. On the nearest corner opposite the hole, charred dust was deposited, and about 20 or 25 feet outward in the Aircourse the ribs from floor to roof were blistered and coked, as if subjected to such heat as might be generated by the explosion of a keg of powder. In no other part of the mine did we find any indication of great heat on the ribs near the floor.

The Room neck and Entry showed indications of their having been considerable heat and force. Charred dust was deposited in the offsets, and the projections of the ribs were worn off on the inby side. Traveling out along the Entry and Air Course, the evidence of the force having gone in that direction, increases. At the intersection of the Aircourse with the Dip B Entry, against the rib, we found the remains of a dinner pail and powder keg. A careful examination of the torn sheet of the keg disclosed the fact of its being a new keg, and that it had been ruptured by an internal explosion. This was in the direct path of the force coming out of the Aircourse of Dip A-1. Several kegs were found throughout the mine, some whole and some battered, but a careful examination of the latter, proved them to be old, and none were burst open by internal force.

A careful examination of each of the Rooms on the Dip A-1 Entry, disclosed more or less heat extending toward but not quite reaching the faces.

Following the Main Dip B Entries to the face very little evidence of heat was visible, but a heavy deposit of soot covered every exposed part. In the last Break-through there had been considerable heat, as indicated by the coked coal on the ribs.

The Left or Dip B-1 Entries showed indicatfons of heat in each break-through, and for some distance on either side. The force traveled out from these two Entries to the Old Main Entry. At the intersection with the Main Entry is a sidetrack. An empty car had been standing at the mouth of the Dip B. Aircourse. The car was hurled by the force across the loaded track to the opposite rib. The force divided at this point, a portion going out through the Old Main Entry to be exhauted in the Old Main workings, and out the Tug River opening, the other turning, going up towards the face of the Main Entry and derailing three empty cars in its progress, on the sidetrack just mentioned, one of which had the side blown out.

The force was greatly diminished from this point to the face. The soot deposit was very heavy in the righ-hand Aircourse.

A considerable increase of force was noticeable in the lower end of No. 12 Entry and Aircourse. This was due probably to the fact that these entries were dry and might have had a heavy deposit of fine dust on the ribs at the moment of the explosion. There was no

indication of there having been any flame at the face of the No. 12 Entry. On the bumper of a car at the face, there was found two 5 lb. powder flasks full of powder, and a roll of cartridge paper. These had been placed there by the miner preparatory to making a cartridge.

Rooms No. 15 and 16 on eleven 1 entry showed the effect of some heat on the ribs.

At the foot of No. 13 room, which is the connection between Eleven-1 and Eleven-2 Entries the projections are considerably worn on the inby exposures, indicating that the force had increased here owing to the contracted area at this point.

The force divided here, part going down Eleven-1 Entry toward No. 9 and the Old Main Entries, the other going up No. 13 Room.

At the head of 13 room the Aircourse of Eleven-2 Entry had been headed through to 13 Room and was driven about sixty feet with the entry. A car in this place had both ends torn out in opposite directions, showing that a reactionary force had operated here. In one or two other places, there was some indications of reactionary force, but this is perhaps the best example. The track was torn up for some distance here. A heavy deposit of soot was deposited from Room 13 connection to the face of Eleven-2 Entry.

The rooms on this entry show more or less evidence of flame having passed through the break-throughs.

The greatest force in this Entry is in evidence near the Junction of the Entry with No. 11 Entry, and from this point outward it diminishes, becoming spent in the pillar workings of No. 9 Entry, where there is no indication of flame.

In our investigation of the mine, we found that in several instances, Entries and Rooms had been driven beyond the distances permitted by law between break-throughs, and while we do not believe that this had any bearing or effect upon the explosion it does show a disposition to neglect upon the part of the official upon whom this duty devolved. At the last visit of the District Mine Inspector no such violations of the law were noted or found.

We also found that there had been shooting upon the solid in several places, either of the whole cut, or in part.

The greater portion of the coal in the affected area, was under cut by 7 foot Electric Machines, and in the majority of the places it was very evident, that there had been an attempt to shoot this cut down its full height, 8 feet, with two shots, one in each rib. We found that some of the miners had placed a center shot and two side shots. Many of the holes examined had been improperly placed and tamped with coal.

This mine was considered an especially safe one. No fire damp has ever been found, and though not a wet mine, it was not a dusty one. Owing to the undercutting of coal by machines, there was undoubtedly a deposit of fine impalpable dust wherever it could find lodgment, and

in suspension, throughout portions of the affected area, and this propagated the explosion, after the windy shot and exploded keg of powder referred to heretofore, had supplied the required force and heat, to put it in motion and distill its gases. The Company seem to have exercised vigilance and energy, in prohibiting the miners from carrying kegs of powder into the mine, despite which, it would appear from our findings and the sworn testimony of one witness, one man did have a keg of powder in the mine in violation of the rules of the Company, and the law of the State.

It is evident to us that this explosion was due to the excessive use of powder, and the improper placing of the hole, and the violation of the law. The miners employed in the mines in this District are chiefly negroes, and ignorant unskilled foreigners, who have no conception of their own danger, or those about them, arising from the careless handling of powder, and the excessive charging of holes.

A repetition of this deplorable calamity is possible at any time in the best conducted mine, unless there are some changes in the method of blasting the coal. We therefore recommend for this and all other dry mines, that the blasting of coal shall be done by shot firers, who shall have the entire charge of the placing of holes, and the amount of powder to be used, and that the shooting be done after the employes have retired from the mine. That all holes shall be tamped with clay. That the ribs and top near the working faces of a machine mine, be washed down with water at fixed intervals and that the bug dust be loaded out before firing the shots, and for this particular mine, or any other where the coal exceeds six feet in height, that it shall be shot down in two benches.

In conclusion, we beg to report that the haulage and ventilation equipment are thoroughly up to date. The fan produced 96,000 cu. feet at the last inspection of the District Inspector. This air was divided into two currents, and was well distributed throughout the workings.

Yours very respectfully,

D. R. PHILLIPS,
District Inspector.

Jan. 8, 1909.

Huntington, W. Va., January 9, 1909.

MR. JOHN LAING,
Chief of Department of Mines,
Charleston, W. Va.

Dear Sir:—At the Lick Branch mine of the Pocahontas Consolidated Collieries Co., in McDowell Co., there occurred an explosion on December 29, 1908, which took the lives of 50 men employed therein.

Several hours after the explosion happpened, I arrived at the mine in company with mine inspectors D. R. Phillips, E. A. Henry and Wm. Warner. Upon our arrival there we immediately began to assist in recovering the bodies from the mine. This work we completed on the evening of December 31st and on the following day with the above

mentioned inspectors and yourself, I made an investigation of the mine. On January 4 and 5, 1909, I made a further investigation along with Mr. D. R. Phillips, the inspector of the district, and a number of other mining men. We examined very closely the sections of the mine which were found affected by the explosion and traced it to where we thought was its point of ignition.

The seam of coal which averages about 8 feet 3 inches in thickness is mined with electric chain machines, by means of hand picks, and in a number of places, I found that it was being shot from the solid.

The explosive used, was black powder and judging from the way a great number of holes were found drilled and the condition of the coal when shot down, it must have been used in very excessive quantities when considering it from any standpoint of safety.

Where undermined, the coal is generally shot down by a row of single shots across the face. In the entries, three holes are drilled to do the work. These holes are started in about five feet four inches from the bottom and inclined upwards until the end of the hole is about seven feet eight inches from the bottom. The rib holes in a number of places, I found inclined into the solid coal.

From information gained in and out of the mine, I have learned that the amount of powder used in the middle or "heaving" hole of an entry equals a cartridge 1½ inches in diameter and four feet long.

The holes drilled are from six to seven feet long and the amount of tamping used, which is the coal slack of the mine, in one of these holes very often offers a less resistance to the powder in exploding than that which it has to exert in breaking through the seven feet eight inches which the end of the hole is from the bottom.

When black powder is used in such a manner, there cannot help but be large quantities of combustible elements such as hydrogen and carbonmonoxide gas produced in its combustion.

At present the mine is being developed on the two and three entry system. Rooms are turned off these entries on 120 feet centers. Even though break throughs would be driven as required by law and no brattice used to conduct the air, the faces of those breakthroughs would go a considerable distance ahead of ventilation before cutting through such thick pillars. This system of working a mine with such thick pillars should be condemned as it allows the working faces to advance too far ahead of ventilation.

In many places, I found the faces advanced a considerable distance ahead of the last breakthrough through which the venilation was conducted and in making the examination of the mine, I could not find any evidence that brattice had been used to conduct the air to these faces. The mine is not known to have generated explosive gas, but, the combustible elements produced in the shooting of black powder as it was done in this mine could find easy lodgment in such places ahead of ventilation.

The mine cannot be considered as a dry and dusty one, but, I do think that enough dust is held in suspension in the atmosphere of the mine from the cutting of the coal and the promiscuous shooting that it was being done to help propagate an explosion once it was started.

The place that suggested itself as the most probable initial point of the explosion is at the face of room 7 off of the second right entry from Dip B entry. This room has onl y advanced in a few feet from the entry. The face of the entry has not been driven beyond the inside rib of this room and an entry breakthrough has been cut through directly in front of it. At the face of the room a hole was fired and from the appearance of the coal, it would be classed as a windy one. An empty car stood in the place ready to be loaded and the men who were supposed to load it were found over in the parallel entry where they evidently had gone to seek protection from the shot when it was fired. The ribs are thickly coked near the place, which diminishes in thickness going out the parallel entry towards the Dip B entries. From this point, it went to the old main entries where the force divided, that going out these entries spent itself out the Tug River opening and through the outer workings of the mine. The other force shows that it went into the old main entry workings, through the rooms to 11-2 entry from where it spent its force through the outer workings.

The explosion from its initial point was propagated by the dust held in suspension in the atmosphere of the mine and the resulting gases from the excessive shooting of black powder.

To prevent a re-occurrence of such a disaster I would recommend that the use of black powder and all high flaming explosives be prohibited: that the coal be double shot or sheared in addition to having it undercut so as to reduce the excessive use of the explosive used: and have the air conducted to the working places to keep them well ventilated.

Respectfully yours,

P. A. GRADY,

Mine Inspector Twelfth District.

REPORT OF LICK BRANCH MINE EXPLOSION.

Clifton, W. Va., January 19th, 1909.

HON. JOHN LAING,

Chief of Department of Mines,

Charleston, W. Va.

Dear Sir:—I hereby submit the following report of the disastrous explosion which occurred at 2:30 P. M. December 29th. 1908, whereby fifty persons lost their lives in the Lick Branch Mine located in McDowell County, West Virginia. It is owned and operated by the Pocahontas Consolidated Collieries Company.

On the date of this explosion I was in McDowell County, assisting

District Inspectors D. R. Phillips, Warner and Grady, in making special inspections of important mines, in compliance with your instructions.

We arrived at the Lick Branch Mine a few hours after the explosion, and immediately took charge of the work of restoring the ventilation, and removing the dead bodies from the mine. Upon entering the mine, we found that it was a local explosion, confined to what is known as the Old Main and Tug River opening, and in no way affecting the New Main workings.

On January 1st, 1909. In Company with Chief Laing, District Inspectors, D. R. Phillips, Warner and Grady with Company officials, we entered the effected part of the mine for the purpose of an investigation, as to the origin and cause of the explosion. In a number of instances we noted that working places both rooms and headings were driven a distance beyond what is known as the eighty foot limit between the breakthroughs; we also found in several working faces where the coal had been shot from the solid, and many of the holes examined had been improperly placed, and tamped with fine coal. In this section of the mine the coal has an average thickness of eight feet, and the greater portion of the coal is undercut by a seven foot Electric Machine, and in many places it was evident that such cuts had been shot with two holes, one in each rib.

In our investigation we found several places in the advance workings either of which could have been the point of origin, as in my judgment, this explosion was principally due to the excessive use of black powder, aided and increased by dust to some extent, as the principal number of dead bodies taken from the mine showed evidence of suffocation. And but few places that were extremely dry showed evidence of great force, which is usually the case in dust explosions.

The natural conditions of this mine are found to be above the average mine throughout the state, and at no time during the work of recovering the dead bodies, or in our final investigation were we able to find the slightest trace of fire damp. While there were no large accumulations of dust in any part of this mine, it is a well known fact, that the undercutting of coal by machinery and solid shooting creates a considerable amount of fine dust, which finds lodgment on ribs, roof and pavement, and is readily put in suspension by an overcharge shot, or by an explosion of a keg of powder, either of which will supply the required force to put it in motion and furnish the heat to distill its gases, with dangerous results to life and property.

As stated before in my opinion this explosion was due to the excessive use of black powder, and to eliminate a repetition of this calamity, I recommend for this and all other dry mines, that safety explosives shall be used in shooting the coal, and that solid shooting shall be strictly prohibited, and where black powder is used in blasting of coal, Shot firers shall be employed, who shall have charge of plac-

ing the holes and the amount of powder to be used. All holes to be tamped with clay, and the shooting to be done after the employes have retired from the mine, and that all dusty sections be kept thoroughly watered at all times while the mine is in operation.

In conclusion I desire to say, that the equipment for ventilation was sufficient to furnish the necessary amount of air for the proper ventilation of the mine, if properly distributed to the working faces.

Respectfully yours,

EARL A. HENRY,
Inspector Fifth District.

LICK BRANCH MINE SECOND EXPLOSION.

The second explosion occurred at the Lick Branch Mine at 8:40 A. M. January 12th, 1909, killing sixty-five miners and injuring one.

This mine is located on the main line of the Norfolk and Western Railroad, about eighteen miles west of Bluefield, W. Va. The elevation of the drift mouth on the Lick Branch side is 2160, and the elevation on the drift on the Tug River side is 2115. The elevation of the fan, about 2500 feet to the North west of the Lick Branch opening, is 2084. The elevation of the Norfolk and Western Railroad at Switchback, is 2054. Those levels refer to the mean tide elevation, From these elevations we find that the coal is about one hundred feet above the level of the creek at the Lick Branch opening.

The Lick Branch was firsrt opened up by the Norfolk Coal & Coke Company, in 1890, and was under the management of Mr. S. M. Buck, President, E. W. Clark and other Bankers of Philadelphia, Pa., were the principal owners.

Mr. Jerkins Jones acquired the Clark interests in 1898 or 1899. Mr. Isaac T. Mann was President, Mr. Jenkins Jones was Vice President and Mr. James Ellwood Jones was General Manager.

On July 1st, 1907, the properties of the Pocahontas Consolidated Company and the Pocahontas Collieries Company were merged, and the Company is now styled the Pocahontas Consolidated Collieries Company, Incorporated. Mr. Isaac T. Mann is President, Mr. C. S. Thorne is First Vice President, Mr. Jenkins Jones is Second Vice President, and Mr. James Ellwood Jones is General Manager.

The minimum output of the mine was 5,705 tons of coal in 1890, and its maximum output was 161,166 tons of coal in 1906.

The plant has 158 coke ovens, which have been in blast since the opening of the operation, except for a few months during the year of 1908.

In my report of the first explosion, I noted that the mine is developed by two main entries, running parallel to each other and about 2000 feet apart. One of the entries is designated as the New Main drift of Lick Branch opening, and the other drift as the Old Main drift or Tug River opening.

The first explosion occurred between the old Main or Tug River opening and the New Main; but did not extend east of the New Main entry. (See map for location of bodies in first explosion, filed with said report).

The coal mined is the No. 3 Pocahontas seam and has an average thickness of eight feet six inches clean coal. It has a sandstone roof and practically no timber is used in posting.

The mine has always been perfectly free from explosive gases. In fact no explosive gas has been found in the mine either before or after each of the explosions.

The mine is ventilated by an exhaust fan 20 feet in diameter, 110 revolutions per minute. driven by 100 Horse Power, 2200 volt, 3 phase A. C. Motor. The fan was originally built by Kenny & Company, Scottsdale, Pa.; but has been recently rebuilt by the company.

The fan was not affected by the explosion so they were able to start it again at once.

The ventilation of the mine at this time was conducted by one intake. The air entering in at the New Main drift and then was conducted to the face of third X entry, and then back to the fifth X entry, through 5-1 entry to the face of eighth X entry. Then through 8-1 entry to its face. Then to eleventh X entry, through 11-2 to 12 X entry, and then back to the Old Main entry, to Dip B or Italy, to face of B-1, and then again back to Old Main entry and to tenth X entry, and from there through Old Main entry to the fan. (See map attached to this report.)

The second explosion seemed to have originated on the east of the New Main entry and to have extended all over the mine.

The Department of Mines was notified of the explosion at 9:02 A. M. on January 12th—just 25 minutes after it occurred.

I left by the first train to the scene, arriving there that evening. I found the mine in charge of District Inspectors D. R. Phillips and William Nicholson, who had a force of men working on the recovery of bodies. I remained until the following day when I returned to Charleston. District Inspectors Henry and Grady afterwards arrived at the mine and assisted in the recovery of the bodies, so that by Friday evening January 15th the mine was cleared of all the dead bodies.

For a location of the position of the bodies as found by the rescuing party see map attached to this report. The numbers refer to the location of the body, also to the name as given in the testimony of the physicians at the Coroner's Inquest.

I arrived again at Lick Branch mine on the evening of January 15th and on the next day, January 16th, together with District Inspectors D. R. Phillips, Earl A. Henry, William Nicholson, P. A. Grady, several mine officials and mining experts, made a careful examination of the workings of the mine on the east side of the New Main entry, for the purpose of ascertaining, if possible, the cause of the second explosion.

We found that black powder was used by the miners in blasting down their coal. As the thickness of the seam is 8 feet 6 inches and is undercut by a seven foot Electric Mining Machine, it would naturally take considerable force to blow down the coal.

The miner begins his hole at about 5 feet from the bottom and bores it upwards so as the back part of the hole will be about one foot from the roof. The depth of the hole will be seven feet, the same as the undercut.

We found an overcharged hole in room No. 21, 5-1 entry, which in our judgment, was, in all probability the initial point of the explosion. This hole was bored on the left rib of the room, and was evidently tamped with slack coal. The coal was blown back from the face and across the room showing that considerable force was produced by the powder loaded in the hole.

The dust adhering to the coal on the ribs, was charred and coked. Also the slack on the floor of the room was coked to a depth varying from one-half to one inch thick near the face of the room.

There is a breakthrough started on the right of this room, about 50 feet from the face of the room. In this breakthrough were found the bodies of two men. (Nos. 29 and 30 see Map attached.) These bodies were badly burned, their clothing having been burnt off and their flesh seemed also to be burned. It would seem, as if these men had gone into this breakthrough to seek refuge while firing the shot.

The effect of the overcharge hole was, that probably a considerable amount of powder was not consumed by blasting the coal, but was spent by burning in shape of a flame. This in turn taking up the finely powdered dust in suspension was doubtless the initial point of the explosion. The single line of force shown in this room and the direction taken from here, determined in our mind that this was the initial point of the explosion.

The condition of 5-1 entry by its charred ribs and coked coal gave additional proof of the blown out shot.

The explosion passed down the room, began to distribute itself throughout various directions in the entry. One part of the force going down fifth X entry to third X entry. Another force going through 5-1 entry to eighth X entry and from there to 8-1 entry, and these forces going through the New Main entry to 11th X entry, and from there to the Old Main entry. Then along this entry to the Tug River opening and also to the fan entrance. Three bodies (Nos. 63, 64 and 65 see Map) were found in Old Main entry. One body (No. 58 See map) was found within 350 feet from Tug River opening.

In studying the layout of the Lick Branch mine, we find that the method of working same, was along practical lines, and evidently no expense was spared to bring the property to its greatest efficiency, both as to ventilation and the safety of its employes.

It is an evident fact, that in mining this seam of coal, other means than pick mining must be employed, and that the blasting of the coal can be accomplished with a minimum amount of danger. In order to accomplish this I think it is necessary to employ shot firers, who shall have charge and be responsible not only for the firing of the shots, but for the quality and quantity of explosives used. Also that all holes should be tamped with clay. That in gaseous mines some safety explosives other than black powder be used. That the blasting as far as

it is possible should be done between shifts, when the men other than the shot firers are out of the mine. Also that the dust from the machine cuttings should be first loaded out before firing the holes. There is no doubt that at present one of the most dangerous conditions in the mine is occasioned by the accumulation of coal dust.

There are several methods that can be employed to keep the mine watered and the air moistened so as to saturize the dust.

I herewith attach the report of the District Inspectors, E. A. Henry, D. R. Phillips and P. A. Grady, also a Map of the mine showing the position in the mine of the bodies as found by the recovering party.

Respectfully submitted,

January 26th, 1909.
Charleston, W. Va.

JOHN LAING,
Chief of Department of Mines.

State of West Virginia:
County of McDowell: ss.

An inquisition taken at Switchback, in the said County of McDowell on the 13th day of January, in the year 1909, and following days, before C. W. White, a Justice of the Peace of said County, upon the view of the bodies of Henry Lee and divers other persons there lying dead.

The jurors sworn to diligently inquire and true presentment make when, how and by what means the persons whose bodies lay dead before them came to their respective deaths upon their oath do say that the said persons, to-wit:

1. Everett Phillips,
2. Luther Boldin,
3. Walter Giles,
4. John Hunter,
5. George Enssey,
6. J. H. Cobbs,
7. Chas. Phillips,
8. A. R. Jones,
9. Frank Hairston,
10. Ed. Rose,
11. Brown Lee,
12. Unidentified,
13. Unidentified,
14. Henry Lee,
15. George Peters,
16. Ernest Terry,
17. Unidentified,
18. Unidentified,
19. Elk Clark,
20. Unidentified,
21. A. R. Miller,
22. Joe Jones,
23. Taylor Staples,
24. David Surratt,
25. Ed. Collins,
33. Dowdy Miller,
34. Peter Heppenstall,
35. Unidentified,
36. C. J. Hariston,
37. J. Henry Bolen,
38. Mike Robensky,
39. Mel Hunter,
40. Jno. Mitchell,
41. H. A. Leonard,
42. S. C. Clark,
43. Unidentified,
44. Unidentified,
45. Jno. Mahoney,
46. Albert Abell,
47. Henry Waller,
48. Unidentified,
49. Tobe Hutcheson,
50. Walter Martin,
51. Jim Martin,
52. Bruce Mann,
53. Chas. Howard,
54. Floyd Buffalo,
55. Chas. Wellford,
56. Jno. Smith,
57. Walter Eversole,

26. Riley Surratt,
27. Anthony Johnson,
28. Lemuel Dean,
29. James Ayers,
30. Robt. Wyatt,
31. Henry Bowles,
32. Dan Arrington,
58. Con Holladay,
59. Clarence Mitchell.
60. Dan Watson,
61. A. P. McDade,
62. Will Durphey,
63. Jno. Hague,
64. Thos. Myers,
65. Robt. Buffalo.

came to their death by an explosion in the Lick Branch Mine, caused by an overacharge shot of gun-powder in room 21 off 5-1 entry in what is known as new main of said mines.

As we, the jury according to the evidence in the above cases further say that we exonerate the Pocahontas Consolidated Collieries Company, Incorporated or the Lick Branch Colliery from all blame and responsibility for said explosion.

In testimony whereof the said Justice and Jurors hereto set their hands, this 16th day of January, 1909.

C. W. WHITE, Justice of the Peace.
W. R. SHEETS, Juror.
O. R. ANDERSON, Juror.
W. C. HORTON, Juror.
E. V. BAILEY, Juror.
E. W. ST. CLAIR, Juror.
CHAS. HARRIS, Juror.

REPORT ON LICK BRANCH MINE SECOND EXPLOSION.

Clifton, W. Va., January 19th, 1909.

HON. JOHN LAING,
Chief of Department of Mines.
Charleston, W. Va.

Dear Sir:—I herewith submit the following report of the second disastrous explosion which occurred at 8:30 A. M., January 13th, 1909, whereby sixty-five persons lost their lives in the Lick Branch Mine, located in McDowell County, West Virginia, operated by the Pocahontas Consolidated Collieries Company.

At the time of this explosion I was in Charleston, W. Va., at which place I received a message from Mr. Laing, Chief of the Department of Mines, advising me of the explosion, also instructed me to hasten to the scene and render all possible assistance in protecting the persons who were engaged in recovering the dead bodies from the mine.

I arrived at the mine the evening of the 13th, at which time I entered the mine and assisted in restoring ventilation and recovering the bodies.

On Saturday, the 16th, I again entered the mine in company with Chief Laing, District Inspectors D. R. Phillips, Nicholson and Grady, with Company officials and Mine experts, for the purpose of investigating the cause of the explosion, and if possible locate the point of origin. The condition inside of the mine gave evidence that the second explosion had occurred in a part of the mine known as the New Main; which part was not in any way affected by the first explosion. We made a thorough investigation of rooms and headings, at which time we found different places that might have been the starting point of this explosion, but the best evidence as to the point of origin was found at face of room No. 21, entry 5-1, where an overcharged shot had been fired on the left side of the room throwing coal to the opposite side of the room. There were also evidence of heat as charred dust on the ribs and pavement, and the bodies of too men found in the breakthrough were badly burned. Judging from the position in which they were found, it was evident that they had retired to this breakthrough to be out of range after lighting the shot at the face of the room No. 21. entry 5-1. The evidence on this entry is conclusive that the force came from the face of room No. 21, which is demonstrated by the rounded corners of the coal on the inby exposures, increasing in volume by a series of new explosions, or re-enforcements fed by accumulations of coal dust, and in all probabilities more or less blasting powder, and spreading destruction in every part of the New Main and the Old Main workings, unless where its force was diminished by the presence of water, or the absence of coal dust.

At no time during the work of removing the dead bodies from the mine, or in making the final investigation were we able to find the slightest trace of fire damp. This being the case in my judgment dust was the principal factor in this fearful explosion, causing great loss of life and destruction to property.

In some instances we found that rooms and headings were driven

beyond what is known as the eighty foot limit, between breakthroughs, we also found several places that gave positive evidence of excessive use of powder; which is certainly a dangerous practice in a dry mine. Where the coal is cut by machinery which creates considerable dust, that would be easily placed in suspension and fired by an overcharge or blown out shot, or by the explosion of a keg of powder.

I am in the opinion that in keeping all parts of the mine where there is an accumulation of dust well watered, especially near the working faces, where the blasting is done would minimize the chances of an explosion. And by the adoption of safety explosives and using clay for tamping with experienced men employed as shot firers, who would have charge of placing the hole and the amount of explosives to be used in each hole would certainly eliminate the probabilities of a general explosion throughout the mine.

Yours respectfully,

EARL A. HENRY,
Inspector Fifth District.

Charleston, W. Va., January 23rd, 1909.

MR. JOHN LAING,
Chief of Department of Mines,
Charleston, W. Va.

DEAR SIR:—At the Lick Branch Mine of the Pocahontas Consolidated Collieries Company, in McDowell county, there occurred an explosion January 12th, 1909, which took the lives of sixty-five men and injured one other person.

On January 5th, 1909, I left this mine after making an investigation of the explosion which occurred there on December 29th, 1908. A report of this investigation I submitted to you on January 9th, 1909.

Hearing of the explosion of January 12th, 1909, I immediately left my home and reached the mine at 1 p. m. on the day following. Up until Saturday I assisted in the rescue work of recovering the bodies, and on January 16th with a number of Inspectors, mining men and yourself I made an investigation to determine if possible what caused this second explosion; happening as it did so closely after the first one.

The condition which existed at this mine prior to the first explosion, I described to you in my report of January 9th, 1909. The mining of coal in one section of the mine was resumed a few days previous to the second explosion. This section is in a different part of the mine and a considerable distance from the seat of the first explosion.

Room No. 21 on 5-1 entry shows evidences where a shot had been fired in the left rib of the face. From the conditions of the remaining part of the hole and of the coal in the face, it could be seen that the charge of powder in this hole when fired caused a windy shot, which I believe distilled the gases from the coal dust held in suspension in the atmosphere of the mine and propagated itself by the dust furnished as it traversed the area covered.

In my first report to you, I made recommendations, which I thought covered the ground thoroughly to prevent explosions in such mines. As

these recommendations might be abused by the class of labor we have working in the mines of our state, I would suggest a further preventative, that shot firers be employed to shoot the coal when all other employes are out of the mine.

Very respectfully,

P. A. GRADY,

Mine Inspector 12th District.

REPORT OF LICK BRANCH SECOND EXPLOSION.

HON. JOHN LAING,

Chief of Department of Mines,

Charleston, W. Va.

DEAR SIR:—I herewith submit the following report on the second explosion which occurred about 8:40 a. m., January 12th, 1909, resulting in the death of sixty-five persons. At the time the explosion occurred I was on train No. 15, on my way to visit some mines on the Norfolk & Western Branch of the N & W. R. R. Upon the arrival of the train at Northfork, I was informed of the disaster and learned at the same time that a freight train was ready to depart. I caught the freight and arrived at the mine about 1½ hours after the explosion occurred.

Upon my arrival the work of rescue was placed in my hands, and I began at once to organize for that purpose. I selected the most practical and trustworthy men available, as foremen for the several departments required in the prosecution of this work.

I was given valuable assistance in organizing the crews by Mr. Nicholson, Inspector for the Eleventh District, who arrived upon the scene in about two hours after my arrival. The organization was made more complete, by the arrival that evening of yourself, and the following day Inspectors Henry and Grady.

The work of rescue was carried on successfully without any interruption, the last bodies recovered in the afternoon of the 15th inst.

On the 16th I entered the mine with the Chief of this Department Mr. Laing, Inspectors Henry, Grady and Nicholson, Mr. Krebs and several other expert mining men, and mine officials, for the purpose of making an investigation as to the cause of the explosion, and the point where it originated. We began the investigation in the entries nearest the opening called the New Main opening: we made a thorough examination of rooms and entries from this point to the face of the workings of the New Main district, which area had apparently not been affected by the former explosion.

As we continued from the first mentioned entries inward to the center of the district, the evidence as indicated by the rounded inby projections and the direction in which the debris had been thrown, was plain that the force had come from some point in advance of us. This condition changed after we arrived at 5-1 entry, at this point the force seemed to have separated going in several directions. The point from which the force seemed to radiate was in the vicinity of No. 21 room, off the 5-1 entry. A careful examination of this room disclosed evidence of great heat having

been there, the ribs were charred and coked, as also was the face of the room and the coal on the floor. A shot had been fired on the left side of the room, a portion of the coal having been thrown to the right side; this together with the shattered condition of the coal strewn in front of the shot, was very good evidence of it having been heavily overcharged. Two men were found in a break-through off of this room in such position as to justify the assumption that they had retired there for protection when firing the shot. These men were badly burned.

We continued from this point forward, to the face of the workings and found evidence of the force in some parts, having become so reduced as to make it next to impossible to determine its direction, but upon moving onward we found that it had been re-enforced again, by dust, powder, or probably the necessary oxygen to produce a more complete combustion of the dust. It was an easy matter when this condition was encountered to trace its course by the direction of the wreckage, and work projections on the ribs.

We found conflicting evidence in many places, but No. 21 room on 5-1 entry seems the most probable point of origin. I re-entered the mine again on the 19th inst. for the purpose of accompanying some expert mining men in an investigation of the mine. I saw considerable evidence that had been overlooked upon our investigation of the 16th, but nothing that altered my opinion as to the point of origin.

Our investigation developed that in several instances, rooms and entries had been driven beyond the distance required by law between breakthroughs; also that in many places an excessive quantity of powder was used in blasting, and that holes were improperly placed.

In my report on the first explosion which occurred December 29th, 1908, I made the statement that a repetition of this deplorable calamity might occur in this or any other mine, unless there were some changes in the method of blasting the coal. I also recomended certain methods by which the danger from this source would be minimized, and I would urge such legislation as would result in taking out of the hands of the ignorant inexperienced miners the charging and firing of shots, and place it in the hands of intelligent experienced men.

Yours very truly,

D. R. PHILLIPS,
Inspector Tenth District.

January 26th, 1909.

Thurmond, W. Va., March 15th, 1909.

MR. H. B. BEURY, Supt.
Beury Bros. C. & C. Co.,
Beury, W. Va.

DEAR SIR:—It has been fully demonstrated in many different ways, and by our experimental station at Pittsburg, that the use of black powder in mines located in the New River and Pocahontas coal fields is a source of great menace to life and property, and I am serving notice on all operators in this district that on and after April 1st, black powder will not be permitted to be used inside of these mines, and that nothing but the so-called safety powder will be permitted to be used to shoot coal