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REPORT

OF THE

CHIEF INSPECTOR OF MINES IN INDIA

Under the Indian Mines Act (VIII of 1901)

FOR THE

YEAR ENDING 31st DECEMBER 1911

BY

G. F. ADAMS,

Chief Inspector of Mines in India

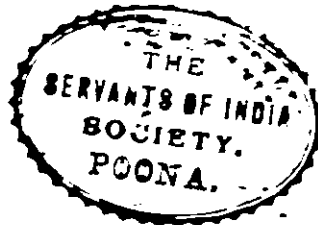


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FROM

G. F. ADAMS, Esq.,
Chief Inspector of Mines in India,

TO

THE SECRETARY TO THE GOVERNMENT OF INDIA,
DEPARTMENT OF COMMERCE AND INDUSTRY.

Dated Dhanbaid, 5th June 1912.

SIR,

I have the honour to submit the report upon the inspection of mines in British India for the year ending 31st December 1911.

EXPLANATORY INTRODUCTION.

It is necessary to explain that this is a report relating entirely to the administration of the Indian Mines Act, 1901, and is not a complete statistical review of Indian Mining and analogous industries. It should be remembered in reading the statistics that there must be a considerable output from quarries which are under 20 feet deep; and owing to the exclusion of such places from the scope of the Mines Act, these figures should not be regarded as a complete index to the production of the mineral wealth of the country.

Figures of production of all minerals raised in British India and the Native States, whether from workings under the Act or not, are published annually in the Records of the Geological Survey of India, whilst every five years a Quinquennial Review of the Mineral Production of India is issued by the same Department. The latest review published is that for the years 1904-1908 (Records, Geological Survey of India, Vol. XXXIX). Figures for Mysore, where most of the Indian gold is raised, are given in the report of the Chief Inspector of that Native State, and mineral statistics may also be found in the administrative reports of the various Presidencies, Provinces and States of India.

This report is divided into five sections, *viz.* :—

- Section I.—Persons employed.
- ” II.—Output of mineral.
- ” III.—Accidents.
- ” IV.—Prosecutions and additions to the Act.
- ” V.—General remarks.

Section I.—Persons employed.

During the year 1911 the average number of persons working in and about the mines regulated by the Indian Mines Act was 146,336 of whom 93,656 worked underground and 52,680 on the surface. Ninety-two thousand and forty-eight of the persons were adult males; 48,971 were adult females and 5,317 children under 12 years of age. This is an increase of 1,656 workers or 1.14 per cent.

There was a small increase in the number of those employed in coal mines, and this holds good also as regards the coal mines of Bengal, where the great majority of the work people were employed, and where, although labour was scarce and most managers could have employed more work people, had they

been forthcoming, there was no acute "labour question" as in some previous years. The increases and decreases in the various classes of other mines will be found in Appendix I, Table 1.

Generally speaking, there was an improvement in the condition of the mineral industry of India in 1911 as compared with 1910.

Labour was again reported to be scarce at the manganese mines in the Nagpur District of the Central Provinces.

At the coal mines of the Assam Railways and Trading Company, in addition to the labour which has been imported for many years from the Central Provinces and Chota Nagpur, the experiment has recently been tried of employing Chinese, Nepalese and Mekranis from Baluchistan. The two latter are the more satisfactory.

At the Cape Copper Company, Limited's copper mine, which was commenced about four years ago, the machine and hand drill men were at first entirely imported from Southern India. Gradually the local Santhals have been taught this work and are now able to compete both at the machine and as hammermen.

Section II.—Output of mineral.

COAL.

There was an increase in the output, which was 12,048,726 tons, and which, compared with 11,387,716 tons raised in 1910, is an increase of 5·80 per cent. In 1910 there was an increase of 0·83 per cent.

Of the total 11,468,904 tons or 95·19 per cent. were raised in Bengal, the rate in the previous year being 94·64. In this Province there was an increase of 691,598 tons, which exceeds the increase for the whole of India, which was 661,010 tons. The increase comes mainly from the Jharia coalfield, where there has been an increase of over half a million tons or just 10 per cent. There were increases of 2·35 and 3·70 per cent. in the Raniganj and Giridih coalfields, respectively, and a decrease, mainly from Palamau, of 13·22 per cent. in the smaller coalfields.

In the North-West Frontier Province, where the output is infinitesimal, there was an increase of 55 per cent. In the other Provinces outside Bengal there were decreases as follows:—Assam 74 per cent., Baluchistan 2·29 per cent., the Central Provinces 4 per cent. and the Panjab 37·84 per cent.

The coal trade generally was better than in 1910 and improved throughout the year. Owing to a late harvest and consequent scarcity of labour in Bengal during the autumn, the year closed without much accumulated stock at the collieries.

The output per person employed during the year was (a) below ground 174 tons, and (b) above and below ground 113 tons. The figures for the three years preceding were (a) 163 and (b) 104. Taking each group of coalfields separately these figures were as follows:—Bengal (a) 178 and 165, (b) 114 and 105; the Central Provinces (a) 132 and 118, (b) 92 and 81; Assam (a) 243 and 255, (b) 150 and 162; Baluchistan (a) 79 and 67, (b) 50 and 45, and the Panjab and North-West (a) 32 and 44, (b) 20 and 27. It will be seen that, except in Assam and the Panjab, there is a marked improvement in this respect. The average in England for the ten years ending in 1910 was 287 tons per person employed above and below ground.

MICA.

There was a large increase in the output, which was 31,686 cwts. compared with 21,375 cwts. raised in 1910. This is an increase of 10,311 cwts. or 48·23 per cent. and restores mica to the place of importance it occupied in 1909.

The increased supply was undoubtedly due to improved condition of trade. It was however unable to keep up with the demand for slab mica. The year

opened in Europe with shortage of stocks and with demand gradually improving. This improvement continued throughout the year and was accompanied by an increase of prices, gradual at first, but advancing considerably towards the close of the year. This increase was specially marked in the prices of medium sizes.

The trade in splittings, which promised well at first, was not so good, especially in inferior grades, the fall in the prices of which depressed those of all but the very best qualities.

The gradual exhaustion of the outcrop workings is compelling some owners to introduce more modern methods of working. Already vertical shafts, well timbered or supported by masonry, are being sunk to reach the veins below the old workings, steam and hand pumps are superseding old fashioned methods of unwatering the mines, winches are taking the place of swing poles to raise the mineral, and manual labour is being economised generally.

MANGANESE ORE.

The output of manganese ore was 441,426 tons, compared with 468,669 tons in 1910, being a decrease of 27,243 tons or 5.81 per cent. The increase recorded for 1910 has not therefore been maintained, and it appears that, although the price per unit of ore remained unchanged at about nine pence, the condition of the industry in 1911 was depressed. Few besides the larger companies carried on their operations, small concessionaries being in many cases unable to work, as the prevailing low rate and want of demand did not admit of their working at even a nominal profit. The values, as received from the mine owners, show a slight, but very slight, advance on those received for 1910.

GEMS.

There was an increase of nearly 10 per cent. in gems, the output being 288,216 carats, while in 1910 it was 262,032 carats. With the exception of 3 carats the entire output is from the ruby mines in Burma. There was very little demand in Europe for the larger and finer qualities, what inquiry there was being entirely for the smaller and cheaper sizes. In India, however, while the finer qualities were in small demand, there was quite a brisk market, chiefly in Madras, for all the inferior qualities, at prices which maintained their level throughout the year.

GOLD.

The output was 8,277 ounces, compared with 3,269 ounces in 1910. This is an increase of 5,008 ounces or 153 per cent. Of the total, however, 2,993 ounces were extracted from the mill tailings of ore raised in previous years in the Dharwar goldfield, but not previously entered in the returns. These mines are now definitely closed down and the tops of the shafts sealed over.

In the last Annual Report I wrote that hopes were entertained of better prospects in the Anantapur district of Madras, and I am glad to be able to say that material progress has been made. There is still only one mine in the producing stage; this more than doubled its output last year, having reached a depth of 575 feet and having a battery of 20 stamps at work. A second mine has, however, been extensively developed to the southern point of the field to a depth of 705 feet, and electric plant has been ordered for hoisting and pumping and for driving the surface plant, the power for which will be generated by two duplicate sets of oil engines. The producing stage is not expected to be reached till 1913. A large increase in the European staff has been made recently in this field owing to the development that has taken place.

SAMARSKITE.

It should be noted that 24 cwts. of samarskite, valued at Rs. 1,329, were extracted from a mica mine in the Nellore district in Madras.

OTHER MINERALS.

There were increases in limestone, iron, copper, salt, slate, wolframite, fuller's earth, steatite and corundum and decreases in magnesite, Jabalpur clay, galena, graphite, chromite, and tin.

Section III.—Accidents.

GENERAL REMARKS.

During the year 1911, at mines regulated by the Indian Mines Act, 1901, there were 137 fatal accidents, being an increase of 20 as compared with the number in 1910 and an increase of 11 as compared with the average number of the last three years.

These accidents involved the loss of 174 lives. This is a decrease of 12 upon the number of deaths in 1910. In that year, however, 55 deaths were the result of 5 accidents, whereas in 1911 only 2 accidents caused more than 3 deaths. In one case 14 persons and in the other 4 persons were killed.

The death rate per thousand employed was 1.18, that of the preceding three years being 1.18. At coal mines only these figures were 1.38 and 1.32, and at mines other than coal .66 and .77. At coal mines in England, during the ten years ending with and including 1910, the death rate per thousand employed varied from 1.24 (lowest) to 1.69 (highest).

The death rate per million tons raised at coal mines only was 12.28, that of the preceding three years being 12.74. At coal mines in England, except in 1909 and 1910, when explosions, causing loss of life on a large scale, occurred, and when the death rate per million tons of coal raised was 5.23 and 6.37 respectively, the rate has not reached 5 since 1895.

Of the persons killed 137 were males and 37 were females.

The deaths occurring in each class of mine worked were as follows:—

One hundred and forty-eight in coal mines; 10 in mica mines; 4 in manganese mines; 1 in salt mines; 1 in wolframite mines; 6 in gold mines; 1 in limestone mines and 3 in copper mines.

Seventeen persons lost their lives by explosions of fire-damp; 94 by falls of roof and sides; 13 in shafts; 7 by explosives; 2 by suffocation of gases; 1 by irruption of water; 19 by haulage; 5 by other accidents underground and 16 on the surface.

A list of these accidents appears in Appendix II, Table 1. In addition to them there were 23 others causing the death of 23 persons. These also appear in Appendix II, Table 1, but are listed separately, a reason being given in each case for their exclusion from the statistical tables.

Sixty-seven per cent. of the statistical accidents and sixty-eight per cent. of the deaths occurred in the Bengal coal mines. Of the persons employed in them, 53 per cent. were employed in Jharia, where, in 1911, 65 per cent. of the accidents in these coal fields occurred. Accidents have largely increased in Jharia. Having averaged just under 43 in number for the previous three years, they rose in 1911 to 60, the great majority of them being caused by falls of roof and sides, which continue to be the most fruitful source of accidents generally, and which are now assuming large proportions. In the year under review they formed 54 per cent. of the total number of fatal accidents, the rate for the preceding three years being 41 per cent.

These figures appear to me to call for serious consideration on the part of colliery owners and managers.

A study of each individual accident shows that many lives would have been saved by the exercise of greater vigilance on the part of the subordinate officials, and more frequent inspections of the roof and sides of all roads open to traffic and of all working places. It is not enough for officials to casually glance at a place for the purpose of detecting dangerous conditions. A systematic examination should be made with a stick or sounding pole and what is of equal impor-

tance is that immediate action should be taken when danger is discovered, either by removing it or by securely fencing the place; and whenever possible the officials should personally see that any instructions they may give for securing the roof or sides are actually carried out.

Inexperience on the part of the miners still contributes towards many of these accidents. It is well known that, unlike the miners in England, they rarely examine their working places either before they start work or at any period during the shift. This indifference will take time to eradicate, but much good would be done, as is done at some mines, in the direction of educating them to protect themselves, if the officials insisted on all miners sounding their working places themselves at each inspection by the officials and saw that any danger observed was remedied on the spot.

In the last Annual Report reference was made to supervision generally. In 1911 there were twenty-three fatal accidents which were due to lack of proper supervision. This matter is referred to in another portion of this report when commenting on individual accidents.

Pillar robbing and working in unauthorised places, which is largely due to defective supervision and discipline, were responsible for nineteen fatal and three serious accidents. When breaches of discipline, such as these, are detected, fines are usually inflicted, and it is hoped that the impending introduction of the special rules for coal mines to be made under section 21 of the Indian Mines Act, which have now been agreed upon between the officers of this Department and a committee representing the general body of managers in Bengal, will strengthen the hands of managers in this respect.

There were 124 serious (non-fatal) accidents, causing injury to 136 persons.

Three serious fires broke out in coal mines in Bengal during the year. The first case occurred at the East Indian Coal Company's Brahmanbarari mine in the Jharia coalfield. The seam affected was No. 15 seam, which is 26 feet in thickness and was being worked by inclines from an outcrop 4,400 feet in length to a maximum distance of 2,200 feet on the dip. The area is split up by barriers of solid coal into three sections of which the north section contains 14 acres, the south section 67 acres and the west or dip section 14 acres. The whole of the area has been divided up by galleries into pillars 50 feet square. These galleries are of the full height of the coal, *i.e.*, 26 feet.

In 1909 goafing, or the extraction of the pillars, was commenced in both the north and south sections and some 12 acres of these were subsequently got. Owing to the great thickness of the seam, however, it was not possible to obtain complete extraction and portions of the pillars had to be abandoned and became crushed in the goaf. Conditions favourable for spontaneous combustion were thus set up and in February 1911 a small fire broke out in the goaf of the north section. This was kept within bounds by flooding and eventually sealed off by brick stoppings.

Warned by this occurrence, the management proceeded to divide up the south section into six panels by means of brick stoppings in dykes and at other convenient points. Before the work was completed, however, a second and independent outbreak of fire was discovered on the edge of a goaf in this section of the workings. Efforts were at once made to cut out the burning material but, just when success appeared to be in sight, heavy falls of roof drove back the workers and compelled the abandonment of the attempt some days later. Meanwhile the goaf had been surrounded by canvas stoppings and the work of reinforcing these with brick was proceeding. A second line of brick stoppings was also being built in the limited openings through a dyke, which traverses the south section and divides it roughly into two halves. Meanwhile the products of combustion were finding their way to the surface through fissures in the subsided ground, but later heavy rains fell and caused a reversal of the air

current, and the smoke was driven back on the workers to such an extent that all work underground had to be stopped, and eventually nearly all the inclines and air pits on the outcrop were emitting smoke and in some cases large sheets of flame. As soon as work underground in No. 15 seam became impossible attention was directed to the salving of No. 14A seam, which is 7 feet in thickness and lies 10 feet below No. 15 seam. All openings between the two seams were dammed off and complete isolation secured. Meanwhile all the openings to the surface in No. 15 seam were gradually closed by earth filling and the fire was then brought under control. It is satisfactory to record that no lives were lost during the conduct of the salvage operations. On one occasion five work people were overcome by foul gases and, but for the prompt action of the manager and staff, would undoubtedly have lost their lives.

It is also of interest to note that subsequent salvage operations, skilfully contrived and boldly executed, have resulted in the recovery of more than 50 per cent. of the area originally lost.

The second case occurred at the Tareni Coal Company's Haripur mine, where a fire broke out in some old workings. It spread with rapidity throughout the mine, and, the pillars being very small and the coal lying at a shallow depth, the whole mine soon collapsed and was lost. This fire also spread to the adjoining mines of Babu B. L. Chatterji and the Baraboni Coal Concern, Limited, on the west and east, respectively, the intervening barriers being too thin to withstand the strain set up by the collapses. The former mine was saved by the building of a few brick stoppings but the latter had to be closed down. Salvage operations have lately been commenced, but, as they have not been completed, they will be referred to in the next Annual Report.

The third case occurred at the East Indian Coal Company, Limited's Kenwadih mine. The salvage operations attempted were attended by an explosion which is reported on in another portion of this report. The mine has not yet been reopened.

Each fatal accident is briefly described in Appendix II, Table 1, but the following are reported on at greater length. The numbers refer to the numbers in the Appendix.

EXPLOSIONS OF GAS.

No. 1. Bengal Iron and Steel Company, Limited's Ramnagar coal mine.

This mine which was a new one, consisted of a single inclined gallery which had been driven down from the surface in a southerly direction for 427 feet, on the full dip of the seam, which is 1 in 8. At a distance of 260 feet a gallery had been driven off on the west side for 35 feet, and, at a distance of 407 feet, another gallery had been driven off, also on the west side. This lower gallery was 100 feet long by 6 feet high by 5 feet wide at the entrance, diminishing to 4 feet square at the face, and was rising slightly towards the face. It was intended to sink a shaft to join the workings at the face of the lower gallery, to form a second outlet for the mine.

The seam is 12 feet thick and is supposed to be a detached portion of the Laikdih seam, which is 100 feet thick.

The incline was driven with the object of proving the property on the rise side of a large fault, so that it partook of the nature of an exploration drift. On the other side of the fault the seam has been developed on a large scale, the workings extending for more than half a mile on the strike and 1,100 feet to the dip.

The workings of the larger mine had nearly reached the fault. Neither in them nor in the new mine had any trace of fire-damp ever been seen or

suspected. This fact had led the management to drive the incline and two levels mentioned without any system of artificial ventilation and, as there was only one outlet, no natural ventilation could be set up. There was a steam pump in the upper level and the heat from it, when at work, and the subsequent cooling, when it was stopped, would cause a slight movement of air in the incline from this level to the surface but below the upper level the air, except as far as ventilation could be effected by diffusion, must have been stagnant, as is the case in portions of so many mines in Bengal.

Both the old and new mines were worked with naked lights.

Only 12 persons worked in the mine, in two gangs of 6 persons each, and each gang worked 24 hours at a stretch. The last gang to work in the mine before the explosion worked in the lower level and left the mine at 6 A.M. Two hours later the sirdar and a banksman went below to attend to the loaded tubs and returned to the surface without entering the level. They both carried naked lights.

At 10 A.M. a fresh gang of three men and three women entered the mine with naked lights, and advanced into the level in single file. When the leading man, named Sambhu Roy, had travelled about half way along the lower level an ignition of gas occurred, accompanied by a rumbling sound as of thunder, flame flashed along the gallery and a rush of air was created, which lifted the men's clothes at the mouth of the incline 450 feet away. All the persons sustained burns about the upper portion of their bodies, but no other injuries. The severity of the burns varied with the position of the persons in the file, the leading three being affected most. One of the three, a girl of 12 years of age, died the following day.

All the evidence showed that there was no report at the moment of ignition, and since there were no signs of explosive force in the mine it is clear that the accumulation of gas was neither large nor dense. As no incrustations of coke could be found anywhere, it is presumed that the explosion was purely a fire-damp one.

The source of the accumulation was undoubtedly a "feeder" that had been liberated by the cutting of coal at the face of the level during the last shift worked. So long as the workers were actively engaged in cutting and carrying, diffusion of the gas would be facilitated to such an extent that the mixture would be kept below ignition point: but on their retirement rapid diffusion would cease and gas would collect. Had the admission of the next shift been delayed a few more hours the death roll in all probability would have been much greater than it was.

No gas could be detected in the mine two hours after the explosion, but next morning Mr. G. O. Leach, the Inspector in charge of the Circle, found a slight trace at the entrance of the level, and a gas cap in the safety lamp, $\frac{1}{2}$ inch in height, near the roof at a distance of 30 feet inbye of the entrance. At this time the level had three feet of water in it.

As regards supervision it appeared that the manager inspected the mine once a week, the assistant twice and a sirdar daily. There appeared to have been no laxity in this respect.

Owing to the total absence of gas in the mine, since it started, the use of naked lights was justified, so that the only feature that raises comment is the neglect to provide ventilation. This neglect constitutes a breach of rule 14 (Coal Mines Code), but, inasmuch as the danger arising from the presence of gas could not possibly have been foreseen, the breach was a technical one and I consider no one is to blame. Had the danger been realized and then disregarded the breach would have been serious.

It is obvious, now that gas has asserted itself, that work in future will have to proceed on different lines. An adequate amount of ventilation will have to be produced before work is resumed, and, even if naked lights are not entirely prohibited in the mine, at least all examinations must be made with safety lamps. The manager has given an assurance that these precautions will be taken.

No. 2. Bengal Nagpur Coal Company, Limited's Gangutia coal mine.

This accident is unique in the annals of Indian Mining and under other circumstances might have had very disastrous results. Two men, carrying naked lights, made an attempt to retrace their steps to the surface through some extensive abandoned workings, through which they had entered the mine, without authority. They lost their way and entered a place full of fire-damp, which ignited at their lights, and caused an explosion resulting in their deaths.

The mine is a large one, working the Sanctoria seam, and dates back to the earliest days of which there is any official record. There are numerous inclines and shafts spread over the property, but only one of each is now in use, the incline being used for raising coal and travelling, and the shaft for pumping and for a second outlet in case of emergency.

The two deceased operated a pump situated at the bottom of this shaft, which is known as the Sanctoria shaft, and were accustomed to travel to it, twice daily, down the incline for a distance of 1,440 feet and along a level 1,500 feet long.

As the Sanctoria shaft was not a very suitable second outlet the manager sent his assistant, with a sirdar and two miners, to try to discover a road through the old workings from the Sanctoria shaft to an old incline known as No. 2. After a tortuous journey they emerged from No. 2 old incline and reported that a road was open. The news appeared to have reached the ears of the deceased, for a week after they decided to make the journey themselves, as this road reduced the distance from the surface to their working place by 2,000 feet.

Their voices were last heard about 3 P.M., calling from the bottom of the Sanctoria shaft to the firemen at the surface to give them steam. About two hours later several people, including the firemen, saw leaves and dust being blown out of an old shaft, situated between the Sanctoria shaft and No. 2 old incline, and some trees growing from the side of the shaft shaking violently. One of them, thinking that an explosion or heavy fall had occurred, hastened to inform the sirdar and on his way met several miners emerging from the working incline with their lights extinguished.

When it was ascertained that the deceased were missing, the manager was advised and a rescue party was formed at once of all the officials and six or seven miners, who carried four safety lamps and six naked lights. As the manager had convinced himself that an explosion had occurred, this proceeding was the height of rashness and might have resulted in the loss of the party.

The search commenced at 7-15 P.M. and ended without effect at 1-15 A.M. It was resumed at 6-45 A.M. the same morning and terminated at 10-30 A.M. by finding the bodies in the extreme west workings. Two open kerosine lamps were found near them and also a number of bamboo fencing poles, around one of which one man had his arms entwined. Both bodies were severely burnt from head to foot and the hair of both was singed, showing the flames must have been intense and must have filled the roadway and not merely been confined to the upper part. The bodies did not show signs of much violence. There were a few lacerated wounds about the head of one, but no bones were broken. Death appeared to have been instantaneous in both cases, for the bodies were found on the fringe of the accumulation.

It was found on investigation that the deceased had come to the surface, had afterwards entered the mine by No. 2 incline and had endeavoured to find their way through the old workings, making chalk marks on the sides of the pillars, to act as a guide for them when making the return journey. At a distance of about 250 feet from the Sanctoria level the marks ceased, but a guide to the level was provided by the sound made by a small waterfall that was known to the deceased to be situated on the rise side of the level along which they travelled daily. It is more than probable that they used this as a guide and consequently ceased to mark the pillars. They apparently forgot, however, that the sound would be of no avail in locating their last mark when they came to retrace their steps. Whether this is so or not, it is clear that

they never found their last mark, for they wandered off towards the west, oblivious of the fact that the workings there contained gas.

The only entrance into the old workings from the present workings before the explosion was through a small hole in a stopping covered by a brattice cloth. All the other roads were closed by stoppings built of stone and mud. In every case these were demolished by the force of the blast. Large stones that had been projected by the force were found deeply embedded in the props and three props at one point were knocked out. Further along the level on the out-by side the timber and pillars were heavily encrusted with unburnt moist coal dust. There was not the slightest trace of coking owing to the very wet state of the level. Had the mine been dry and dusty the explosion probably would have been propagated throughout the workings of the mine and a heavy toll of life taken, as the mine was full of people at the time.

The gas which caused this explosion was so far removed from the working places and travelling roads of the mine as to render it harmless to the persons in the working portion of the mine, and consequently the manager cannot be blamed for not having it kept cleared, but the particular lesson inculcated by the accident is the danger that must always be present where a large accumulation of gas, accessible by any means to the workmen of a mine, exists. If it is impossible to remove such an accumulation nothing less than completely isolating the area with stoppings should be attempted. Except for the small hole in one of the stoppings this was actually the case here, and I do not consider that any one, except the deceased themselves, were to blame.

No. 3. East Indian Coal Company, Limited's Kendwadih coal mine, Nos. 2, 3 and 5 shafts.

For the first time in the history of the Jharia coalfield, I regret to have to report an explosion, which resulted in the death of fourteen persons.

There are three seams worked from these shafts, being, in descending order, Nos. 14, 13 and 11. The explosion occurred in No. 13 seam, which varies in thickness from 16 to 25 feet and lies at a depth of 210 feet. No. 14 seam is 26 feet 6 inches thick and No. 11 seam is 18 feet thick. The workings and the positions of the shafts are shown on plan A. It will be seen that Nos. 2 and 3 shafts are close to one another. The workings in their vicinity were those affected by the explosion.

The colliery was worked with naked lights and no trace of fire-damp had ever been detected.

On the afternoon of the 6th November the European assistant was told that two women had been ill near an old goaf situated to the rise of the pits, from which the pillars of coal had been removed. This goaf is marked "FIRE AREA" on plan A. He did not, he says, suspect that their illness was due to foul gas, and there is no particular reason why he should have done so.

On the morning of the 7th, however, several work people, on proceeding to work in No. 11 seam, were overcome by foul gas and it was evident that a fire had started somewhere underground. This was traced by the management to the goaf above mentioned. No sign of actual fire was visible but white vapour was seen and the west side of the goaf was found to be warm. There was a smell of firestink near the junction of the jig road with No. 2 pit main level, about twenty feet up the jig road.

This rise goaf district had been getting warm for some time and no work had been carried on there for five or six months before the explosion. About two months previously some stoppings had been erected on the south side of the No. 2 shaft main east level, which the management state had had the effect of cooling the district considerably.

The agent arrived at the colliery at midday on the 7th and it was decided to attempt to dam off the fire by erecting brick stoppings. All the fire stoppings which were subsequently erected and those which would have been erected if the explosion had not occurred are shown in red on plan A, the old ventilation stoppings being shown in black. During the night the old ventila-

tion stopping at A, which was half way up, was knocked down and a stronger one commenced. A stopping at D was also commenced.

On the following morning, the 8th November, Mr. R. R. Simpson, Inspector of Mines for No. 1 Circle, to whom information had been sent, arrived at the mine. He made an inspection, accompanied by the agent and the manager. They examined the fire area and found smoke in the roof cavities at several points. They then passed through the fault by a drift into No. 11 seam, where the work people had been overcome the day before. They passed rapidly through the galleries, finding the firestink very strong and being to some extent physically affected by it.

A consultation was then held. The agent had on the previous day considered the feasibility of building stoppings round the fire area and then closing the area by a stopping in the rise connection in No. 11 seam. He had however, abandoned the idea on account of the number and large size of the stoppings required and had arranged for stoppings at A, B, D and E. The building of the first three of these had been commenced, and it was finally agreed upon between the agent and Mr. Simpson that, as No. 3 shaft was the upcast and as there was slight firestink on the east level leading from this shaft, these four stoppings should be completed first and that then, if practicable, other stoppings should be built as shown on plan A.

Stoppings at A, B and D had already been commenced, and the work of erecting that at E was now commenced. An attempt was made, first to construct the latter with tins full of sand, but the work could not be completed, owing to foul air. For the same reason the work at D had to be given up. It was then decided to finish B, to take out the old stopping there and complete the stoppings at D and E from that side. It was subsequently found that a new stopping had also to be built at C and this work was commenced also. The old stopping at C was taken down during the night.

The manager descended No. 2 shaft at half past seven the following morning, the 9th November. The stoppings at A, B and D were completed. That at C was three feet from the roof, and that at E was as it had been left the previous day, about half way up in a gallery 10 feet high.

He returned to the surface at half-past eight, and a few minutes afterwards an explosion occurred. A vast cloud of dust was emitted from No. 2 shaft (downcast) to a height of about 200 feet. No. 3 shaft also sent out a cloud of dust, and native witnesses affirm that dust came up No. 5 shaft also.

The cages at No. 2 shaft were found to be jammed, but those at No. 3 shaft were clear, but the shaft was upcasting, and was emitting smoke and strong firestink. The cages were kept going up and down and in about half an hour two men came up. Just at the top one fell off and fell down the shaft. The other was rescued but subsequently died.

By this time one cage was cleared in No. 2 pit and about an hour and a half after the explosion a rescue party, consisting of the manager and Mr. Simpson, went down in it and seven survivors, more or less injured, were brought to the surface. Shortly afterwards Mr. Simpson, with two of the European assistants, again went down. They reached No. 3 shaft and brought out two injured men that way. Another injured man was shortly brought up by a party headed by the agent, who arrived shortly after the explosion and who again descended at noon with the manager and Mr. Simpson and brought up the last survivor.

On the following day, the 10th, the bodies of the nine persons who had been killed outright by the explosion were brought to the surface. The body of the man who fell down No. 3 pit was also recovered.

It was then considered that further exploration must entail risk to life and that nothing further should be attempted. With this opinion I quite agreed when I arrived at the mine from tour on the evening of the 10th. The pits were sealed down and have not yet been reopened.

At the time of the explosion sixteen men and five women were underground. Of these four men and all the women were killed outright, one man

fell down the pit when coming up and was killed, and eleven men were rescued alive. These last were all badly burnt, and four of them died subsequently.

The total death roll was therefore nine men and five women.

The positions of the bodies as found are shown on plan B. This plan also shows the positions of the survivors, those who subsequently died being distinguished from those who recovered, the approximate positions of all persons at the moment of the explosion, as far as could be gleaned from the evidence, and the directions in which the stoppings were blown by the force of the explosion. The numbers are as are entered in Appendix II, Table 1.

The general direction of the ventilation of the mine after the outbreak of the fire is shown on plan A. It must not however be inferred that there was an appreciable current of air moving in the directions shown by the arrows. In the great majority of the mines in the Bengal coalfields, in which no fire-damp is found, the air current is very feeble, ventilation practically being effected by diffusion. In this particular case the old ventilation stopping at A was only commenced a few days before the explosion and, as has been stated, was taken down when only half built to make room for the new fire stopping. In the absence of a ventilation stopping at this point, the air would tend to be short-circuited up this gallery and very little would go up the gallery to the east of B. As a matter of fact the firestink, although most of it was taken by the air current into No. 11 seam, did to a certain extent find its way down on the east side to the No. 3 shaft (upcast) east level. It was owing to this that the building of the stoppings at D and E had to be temporarily abandoned on the 8th.

As regards the actual cause of the explosion, all who were concerned in it hold the opinion that the explosion originated at the fire, and with that opinion I agree. The directions of the force, as shown by the red arrows on plan B, distinctly tend to show that the force came from inbye of the fire stoppings, blowing them all except one towards the pit. The fact that they were blown out in this way goes to show that such force must have been very considerable, an additional proof of which is furnished by the fact that all those found dead had sustained injuries in addition to being burnt.

The only possible alternative theory is that gas found its way back over the unfinished stopping at E and was ignited by a naked light carried by one of the persons near it. I do not consider that in such a case the force would have been so clearly indicated in one direction. No fire-damp had ever been seen in the mine and it is evident that such explosive mixture as was present was distilled by the fire, which would be the nearest and the most obvious means of igniting it. I would here invite reference to the last Annual Report, in connection with an explosion at Namdang mine in Assam. I quoted the case of a similar occurrence at Charanpur mine in Bengal and stated that, although in most of the coal seams in India fire-damp may not be detected in ordinary working conditions, yet, when these seams are on fire, explosions of gas, the exact composition of which cannot be ascertained, are liable to occur. Moreover the fact that the manager went to every fire stopping with a naked light and found everything in order within half an hour of the explosion tends to show that it was not caused by a naked light.

I consider the theory that the gas was ignited by the fire is the more probable and the more natural one.

Two facts stand out: firstly, that the order in which the stoppings were completed undoubtedly had the effect of preventing oxygen getting to the fire, but at the same time did not prevent the products of combustion being carried away from the fire into No. 11 seam. The stopping at A was closed on the afternoon of the 8th, that at B at half-past ten that night and that at C at quarter to six next morning, about three hours before the explosion. Secondly, that very shortly after these dams were closed, an explosion did occur.

I quote the following from Robert Lamprecht on "Recovery work after pit fires," translated from the German by Charles Salter:—

"When a section of a mine is to be isolated by building dams in two headings one above the other, the question arises which dam shall be put in

first. Experience and theory indicate that when the burning section is one that carries fire-damp, the upper level is the one that should be first shut off. Demanet gives the following particulars of a report drawn up by the experts engaged in extinguishing a fire at the Agrappe colliery (Belgium) :--

‘“When the upcast airway is closed, the products of combustion are held back and become mixed with the air that makes its way to the seat of the fire.’
 ‘Concurrently a liberation of fire-damp occurs in the burning section and tends to form explosive mixtures with the incoming air, a tendency that is however neutralised by the combustion products, the presence in the proportion of only 10 per cent. being sufficient to prevent explosion. On the other hand, if the intake airway is closed first, and the products of combustion are allowed to escape without restriction, their lightness enables them to disperse readily, whilst the air in the burning section becomes impregnated with the fire-damp and the formation of an explosive mixture becomes inevitable.”’

“Certain precautions should be observed in finally closing up the dam. For example, as the fire usually continues to burn for some time longer, until the supply of oxygen in the enclosed air is entirely consumed, the resulting gases would exert considerable pressure unless they found some way of escape. On the other hand, any indraught of fresh air, in consequence of the cooling down of the imprisoned atmosphere, must be guarded against, or the fire may revive; and again, as has frequently happened during recovery work in Hungarian collieries, dangerous explosions are liable to occur if the outflowing gases are checked too suddenly.”

“In Belgian pits the following precautions are adopted :—In the upper part of the dam is placed an elbow pipe, which dips into a vessel continuously supplied with water through a pipe fitted with a tap, which is turned on so that the vessel slowly fills with water, the men thus having time to withdraw. By this means the outflow of gas is gradually checked and finally stopped, in proportion as the pressure of the water column overcomes that of the gas. Subsequently the surplus water merely overflows and runs away, or else the tap is turned off by the men on their return. In addition, this arrangement affords a continuous indication of the progress of the fire, by the volume and nature of the gases escaping from the bent pipe and through the water; and finally, when the atmosphere in the burning section contracts on cooling, water alone and not air is drawn into the rear of the dam. For this purpose the water tap must, of course, be left open wide enough to supply a sufficiency of water to the vessel.”

At the time I would have agreed with what Mr. Simpson and the agent proposed. But from each of these events something may be learnt and if the work had to be done again under similar conditions, it would, I now think, be wise to attempt to put in first the stoppings in the rise workings shown on plan A, which would have been built if the explosion had not occurred, and also the stopping at E, all being on the return side of the fire. If that was impossible, and it very likely would be impossible, owing to firestink, it might be possible to choke back temporarily the products of combustion on to the fire by erecting brattice sheets to enable these stoppings to be built. If however that could not be done, it would perhaps be best to build the stoppings at A, B and C, being on the intake side, three quarters of the way up, and then see if matters were improved at all on the return side of the fire, and, if so, to build and finish off the stoppings there before completing those on the intake side, in this way preserving the *status quo* at the fire as long as possible. Although I do not consider that this particular explosion was caused by a naked light, still, as a precautionary measure, safety lamps only should be used when building stoppings to dam off fire.

An explosion having taken place at the fire, it is probable that it was augmented by dust on the way. It has been noticed several times how very small a quantity of dry dust will so augment the force of an explosion. Although opportunities for exploring and taking observations after this explosion were very few, the agent has informed me that he saw coked coal dust on one of the timber props near No. 2 shaft.

The work of extinguishing fires is at all times difficult and sometimes hazardous, and, owing to the fact that in most of the thick coal seams in Bengal not only are there no panels or barriers of coal left but the floor coal has been cut throughout the workings, necessitating the erection of stoppings of a very large size, the difficulty and danger in these mines are increased.

Pillar cutting is a natural development of our system of work and will be more extensively practised in the future than has hitherto been the case. It is impossible not to leave a certain amount of coal behind in the goaves in this operation. This coal is crushed by the falling roof and spontaneous combustion, in the majority of seams in this country, is inevitable. By the judicious arrangement of panels and stoppings all the pillars in the panel can in most cases be got before fire breaks out and, in the event of fire, the effects can be minimised and only a portion of the mine need be temporarily abandoned. The question of arranging panels, or at any rate leaving the floor coal uncut along certain definite lines in all seams exceeding 8 feet thick, so that fire stoppings, to form panels, can be quickly built at a low cost is, in my opinion, the most important question now before the mining community of Bengal, both from the point of view of danger to life and of loss of property.

FALLS OF ROOF AND SIDES.

No. 9. Hariladih Coal Company, Limited's Kenwadih coal mine.

This accident occurred near the broken edge of a recently formed goaf from which the timber had just been drawn. The European assistant had ordered the sirdar to fence the place and then proceeded elsewhere. While the sirdar was searching for wire for the fence, a timbering coolie asked him if he might return to the goaf to get some timber. The sirdar declared that he refused this request. As soon however as his back was turned, the coolie entered the goaf and, while he was there, a pane of roof shale, 3' 0" x 2' 9" x 4", fell upon his right foot, causing a compound fracture of it. He died in four hours.

The accident would not have occurred if the sirdar's orders had been obeyed. It is noteworthy what little control the subordinate officials in many mines exercise over the miners. They are often sufficiently well-trained to detect dangers, but they lack the power to enforce their orders. Discipline cannot be expected from the miners if the sirdars are not disciplined, and this seems to be a matter that should receive more attention from managers than it does.

That such a comparatively slight accident should terminate fatally in four hours time shows the remarkable low state of vitality possessed by some of the workmen. With the exception of the injury to the foot and an incised wound on the skull, there were no other injuries. The victim was carried to the surface and to his house close by, where the colliery doctor attended to him. The doctor states that he was summoned almost as soon as the accident occurred and arrived at the house at the same time as the deceased. Even at this stage he found signs of collapse and a very feeble pulse, due to shock. He treated him for shock but was unable to restore vitality. Bringing the man from the warm mine into the cold air (it was evening), without well wrapping him up, may have aggravated his condition, and this leads on to the contention that injured persons would stand a better chance of surviving if they were left underground until the doctor was called.

No. 17. Babu Brojo Bhusan Trigunait's Ramkanali coal mine.

Taking advantage of the absence of the sirdar, who had gone to the surface to eat his midday meal, three men passed through a fence and began to rob coal from the corner of a pillar. While doing so, they were killed on the spot by a fall of roof stone, 38' by 4' to 15' by 10'.

There was no official in the mine at the time of the accident. The practice of allowing sirdars to leave the mine at midday without being relieved by other

officials is responsible for many accidents from pillar robbing. It is a practice to which many managers have put an end, and it is to be hoped that insistence on the precaution of always having an official underground when miners are at work will soon become universal.

No. 24. Equitable Coal Company, Limited's Dishargarh colliery.

In this case a woman was killed by a fall of about a ton of coal, which occurred in the main shaft level, only 40 feet from the shaft. It was stated by the assistant and by the head sirdar that they examined this road by sounding the roof with a stick on the morning of the accident. It is difficult to conceive that the roof should have passed from a condition of soundness to one of collapse in so short a time in the total absence of any contributing cause. Owing to the presence of a steam pump the place was steamy, but it had been in this condition for years and therefore the steam would not have any sudden effect. The examination, if any was made, must have been of a perfunctory nature. Main roads, often being far distant from the actual working places, are apt to receive scanty attention at the hands of the supervising staff. It is just as important that they should receive careful inspection as the working places.

Although the roadway at this place was of the unusual width of 22 feet, there was very little artificial support, only a prop being set here and there. That the management are not heedless of the future safety of their people when once their attention had been called to the defect is shewn by the precautions they have taken since. Two rows of cogs—one on each side of the road—have been built for a considerable distance along the road with props between them and also in the middle of the road and the roof lined with steel rails and covering boards. The sides are being lined with brickwork. There is hardly a square foot now unsupported, but it is reprehensible that these precautions were not taken before, as they were obviously necessary.

No. 29. Burra Dhemmo Coal Company, Limited's Burra Dhemmo coal mine.

This accident was due to neglect to remove a danger as soon as it was discovered. Four persons were making their way out of the mine, when a piece of shale, measuring 4' by 2½' tapering from 10" to 8" thick, fell from the roof near the side of a gallery and struck one of them. He died twelve hours later. Another man was seriously injured but recovered.

The seam is 4' 6" thick and immediately above it is a band of shale of a treacherous nature. Unless the shale is got down as the coal is extracted timbering has to be resorted to. Four roof dressers are specially employed to take down the shale and at this place it had been taken down over the middle of the gallery, but a little had been left near the sides.

During his inspection on the day before the accident the day sirdar detected the insecure nature of the roof and marked it with chalk for attention, subsequently instructing a roof dresser to take it down. These chalk marks were still on the fallen stone after the accident. The roof dresser stated that he attempted to get the stone down, but failed. This is unlikely. The night sirdar stated he tested the roof at this place that night and found it good. This is also unlikely. The roof must have been insecure the whole time and should have been taken down or the place fenced off.

The day sirdar had not informed the night sirdar of the danger. This raises an important point in supervision. Each sirdar should personally make over charge to his successor and state exactly where danger, if any, has been observed and what steps have been taken to remove it. Men of the calibre of sirdars naturally will not do this unless trained to do so by their superior officers.

No. 30. Indian Collieries Syndicate, Limited's Jamadoba coal mine.

The seam is 7'-3" in thickness and is cut up into pillars, 40' to 50' square, by galleries 10' to 12' wide. "Broken" working was going on and some 12

pillars had been extracted by the process of splitting each pillar into 4 or 6 stooks or knobs, which are then removed in turn. Timber is used in abundance and as each stook is extracted the timber is drawn off. The work is supervised by an experienced European miner and by sirdars.

Three miners were engaged in taking out the last stook of a pillar. The stook had been reduced to about 6' X 10', when a sudden weight came on and it was rent asunder. It is probable that the removal of this support initiated a fall on the goaf edge, which rapidly involved the whole area by swaying out the timber in the direction of the dip. Only one man escaped by running out. Two men and a woman were caught under the very edge of the fall and were killed on the spot.

As the result of consultation with the general manager the following additional precautions for safety were agreed upon :—

- (1) No "broken juds" are to be allowed to stand on timber over a week end.
- (2) When the roof does not fall at the time the timber is drawn off, no further work is to be done on that pillar except under the supervision of the manager or European assistant.
- (3) The final stage of reducing a pillar or stook is not to be done on the night shift. The place is to be fenced off for the night and the reducing of the stooks only done in the day shift, when the mines are under the supervision of the European staff.
- (4) Special attention is to be given to the timber in pillar workings to see that it is wedged up tight.

No. 31. Hariladih Coal Company, Limited's Kendwadih coal mine.

A miner was found working in the face of a fenced off gallery and was sent out by the sirdar. Shortly after he returned and recommenced work and was killed by the fall of a slab of roof, measuring 5'-3" by 2'-4" by 6".

About 7 tubs of coal had been worked in this place without the knowledge of the officials. As this is the equivalent of three days' work, it is evident there was want of proper supervision. The contractor and both the company's sirdar and contractor's sirdar were fined after the inquiry had been held.

No. 32. Sudamdih Coal Company, Limited's Sudamdih coal mine.

Two miners went through a fence and had no sooner begun to rob coal from a pillar than about a ton of coal and stone fell from the roof and killed them on the spot.

The sirdar had been through the workings just before the miners came to work, but had not had time to visit this place again. He had to look after half of the workings of an extensive colliery and inspect in two different seams. The inspector holding the inquiry was quite of the opinion that the supervision of the mine was inadequate, and pointed out in his report that he had to complain of the same defect when inquiring into an accident the previous year. The mine was then under another manager.

The fall occurred in a gallery twenty-five feet high. The necessary examination of roof and sides is extremely difficult in galleries as high as this. It is proposed to work this mine in future on a different system which will obviate the making of such high galleries.

No. 34. Bengal Coal Company, Limited's Murulidih coal mine.

A gang of seven stone cutters were engaged in blasting down roof and building a pack wall with the rock so obtained. While building, a stone, 7' X 2' X 2', fell from the edge of the ripping upon one of them and he was killed.

on the spot. He was only 16 years of age and had only three months' experience of mining. Boys of practically no experience should not be employed on such work. The accident occurred at night and the only supervision employed by the company was that of a sirdar, who had twenty-two gangs of miners in two areas of "broken" work to look after in addition to this gang. He naturally would spend most of his time supervising "the broken." The accident might have been avoided if the supervision had been closer.

No. 37. Assam Railways and Trading Company, Limited's Tirap coal mine.

The coal band being worked was 8' in thickness and the dip was 25°. Roadside pillars were being got and the road at this place had been widened to form a "chamber," 14' by 11' by 7' high. A miner was engaged in getting down roof coal with a long crow bar and shouted a warning that the coal was going to fall. He retreated, but a sirdar shouted that there was no danger and went towards a tub, which was on the rails close to the "bolt hole" or entrance to the "chamber."

The coal fell and with it came a thickness of six feet of rock and coal from the roof at a slip on the high side. The fall extended beyond the "chamber" for 8 feet along the road and brought down four bars set on props. The whole road was filled by some 30 to 40 tons of rock and coal. The pillar between the "chamber" and the roadway, which was only 6' thick, was crushed out and the sirdar was killed on the spot.

When a road pillar has been reduced to small dimensions, as in this case, the rails should be lifted and the tub moved back to the next pillar out-by. The deceased apparently thought he was safe at the tub.

No. 41. Gopalichak Coal Company, Limited's Gopalichak coal mine.

This accident took place in a "broken" district where a gang of seven men were employed in taking out a pillar. Owing to trap and jhamma the workable thickness of the coal varies considerably. At this point it is from 9' to 16' thick. On the north side of the pillar 16 feet of coal had been worked up to the sandstone roof. The upper part of this coal was then found to be inferior and an attempt was made to leave a thickness of 2½ feet of roof coal unworked and supported by vertical timbers. No sprags or horizontal stays were used with the result that, on a "slippery back" being exposed at the foot, a mass of side and roof coal, 20' long, came away, swaying out the vertical props. Two men were killed on the spot.

The practice of leaving roof coal with a long loose end on vertical timbers only is highly dangerous.

No. 47. Standard Coal Company, Limited's Benahir coal mine.

This accident took place in an area of workings, where coal pillars, 45 feet square and 20 feet high, had been formed in a seam 26 feet thick. About a dozen coal cutters were employed in taking up a thickness of 3 feet of floor coal. Practically the full width of the galleries was being cut and a very small error on the part of the miner would lead to the undermining of the pillars. The seam is traversed by pronounced joints, inclined at angles of from 0°-25° from the vertical. The workmen were Bilaspuri coolies, who have little or no regard for discipline. They appear to have had no regular working places, and each man worked in any of the galleries which happened to be vacant at the time when he came to work.

One of the workmen wrongfully undermined the corner of a pillar, and a mass of 10 tons of coal fell from a slippery joint on to a woman, who was carrying coal from an adjacent working place and happened to be passing at the time.

The man who caused the accident left the mine immediately afterwards. It is not improbable that he had observed the weakness of the corner of the

pillar due to the slippery joint, and deliberately undermined it with the idea of getting a large quantity of coal easily. It is fortunate for him that the coal did not fall towards him but in the direction of the strike of the seam and at right angles to him.

The workings were overlooked by an overman. This man had not visited the place that morning, but would have done so later on. An inspection had been made by a sirdar, but this man's duties appear to have been chiefly of a recruiting character. The night shift sirdar had visited the place towards the end of his shift and claimed that it was then in a safe condition. This may have been so, as it would not take very long for it to become unsafe.

Although the immediate cause of the fatality was the illegal act of the miner, yet for the following reasons the management cannot be considered blameless:—

- (1) It was imprudent to entrust such dangerous work to Bilaspuri coolies. Their lawless character is well known.
- (2) The supervision was insufficient.
- (3) It is not a safe practice to permit of the floor coal being cut to the full width of the gallery.
- (4) As far as possible each miner should have a definite working place, for the proper working of which he can be held responsible. This was not the practice. The miners worked practically where they pleased.

No. 50. Hariladib Coal Company, Limited's Kendwadih coal mine.

This accident happened in a pillar-cutting district. The method of extraction practised is to split the pillars (40' square) into four by cross drivages. This leaves stumps about 15' square which are removed one by one as rapidly as possible by miners working from all sides.

At the time of the accident 9 miners were working all round a stump, measuring 9' x 10'. The two men working on the dip side undercut to a "joint" from which a mass of about 2 tons of coal fell on them. One was killed on the spot and the other was severely injured. Six props were knocked out by the falling coal.

There was no lack of timber set, but only spragging would have kept up the coal which fell. The practice of allowing miners to work on the dip side of a pillar is unsafe, and the manager agreed to prohibit it.

No. 54. Messrs. F. F. Chrestien & Company's Charki mica mine.

A man and three women were carrying mica to an unworked part of the mine, where it was to be sorted, and as they passed along, the hanging wall, which was composed of schist, collapsed for a length of 25 feet and a height of 14 feet. The fall averaged two feet in thickness. Three of the deceased were killed outright and the fourth died on the way to the hospital. The exact slope of the hanging wall at this point could not be determined after it had fallen. The manager stated it had been sloped back to an angle of about 60 degrees. Evidence went to show that it had stood as it was for four years, and that no cracks had been noticed prior to the accident. This can be quite believed, for it was evident that there had been a sudden collapse throughout the mine. In addition to the portion which fell, cracks were visible in several other places. The mine is an extensive one and consists of a large open working, which was being excavated where pits and tunnels had originally been sunk and driven. The extent of these pits and tunnels is unknown, but in any case such an excavation is necessarily weak and requires more care than one in solid strata. The officials however thought the mine safe, but the event shows that they were mistaken. Since the accident rules under section 20 of the Indian Mines Act have been made for manganese, mica and limestone mines, and one of the rules requires that the sides of open workings shall be sloped, stepped or

secured in such a manner as to prevent danger from falls of material. The proper observance of this rule will prevent accidents of this nature in open work excavations.

No. 59. Panjab & Bengal Coal Company, Limited's Burragarh coal mine.

In this case a man and a woman were killed by a fall of side coal. The accident occurred in an incline at an early hour on a Sunday morning. No night shift was worked at the mine and the officials state that they were unaware of any person being in the mine. There have been cases in previous years where accidents have occurred and upon inquiry it has been found that the officials were unaware of the deceased being in the mine. If the mouths of inclines were fenced at week ends and at nights, if no work is to go on, or fitted with gates, to be closed at these periods, risk of an accident occurring would be lessened, and, in all probability, considerable surreptitious robbing of coal would be prevented. The practice of fencing under these circumstances is in force now at more than one mine and has proved effective.

No. 60. Babu Rai Gosta Behari Lal Singh and others' Nodhia coal mine.

Four men had just gone down to work in the bottom of a pit, which was being converted into an incline, when a brick side wall and the ground behind it collapsed, killing three of them.

The fallen ground and bricks so filled up the excavation that it was not possible for the inspector who held the inquiry to ascertain the thickness of the wall or the exact cause of the accident. The manager stated that the wall was 2' 6" to 3' 0" thick. The quality of the mortar was found to be very poor, and the wall was built without any batter. The top five feet of the superjacent ground was composed of hard laterite, 5 feet thick. There had been a fall about a month previous to the accident, before the brick wall had been completed, and it was stated that the laterite had been left overhanging and the wall built in under it. It is possible that the first fall had left the ground in a weak state and that it again slipped, carrying the brick work with it. It is also possible that the wall was built on a soft or sloping foundation, and that the stability of the brickwork had been affected by the heavy rain that had fallen.

Vertical retaining walls are greatly strengthened if they are arched or provided with a substantial batter. Had the wall been built on a firm foundation and of reasonable thickness, and either of the above precautions taken, the accident would not have occurred.

No. 61. Maharaja M. C. Nandi's Ekra Khas coal mine.

A miner had taken advantage of the sirdar's absence from the mine for a meal at midday to go beyond a fence into an unused gallery and, whilst robbing a pillar, was killed by the fall of one ton of side coal, 4' 6" × 4' 6" × 1' 2". Since the accident the manager has arranged for all sirdars at the mine to be relieved at midday and for the work to be constantly supervised.

No. 65. Lutchipur Coal Company, Limited's Panchgatchia coal mine.

A miner was engaged in the act of cutting down the corner of a pillar, when the coal unexpectedly fell from a cleavage plane. He stepped back quickly to avoid being struck and, in doing so, stumbled over a heap of coal, which he had previously stacked behind him.

He sustained slight injuries only, but died seven hours after the accident. In the opinion of the colliery doctor death was due to shock, supervening on a constitution already weakened by disease.

To facilitate subsequent extraction of the coal, deceased had undercut the corner of the pillar to a depth of 15", in accordance with the prevailing custom of the mine, when the sirdar came on the scene and, observing a marked cleavage plane running obliquely across the corner, ordered deceased to cease undercutting and dress back the coal to the plane. He stated that he chalked the holing in token of this order. Immediately he went away, however, deceased continued undercutting, with the result as stated above. Had the sirdar's order been obeyed the accident would not have happened.

The practice of building a large heap of coal immediately behind the miner is to be deprecated, for the heap cuts off his rapid retreat in case of coal falling from the face or roof. During the last few years this practice has contributed to several accidents. It is almost as easy to stack the coal 10 feet away as it is to stack it 5 feet away and the former distance should be insisted on.

No. 70. Sendra Coal Company, Limited's Sendra coal mine.

Deceased was robbing a pillar in a gallery which was used as a travelling road, when a mass of coal, 10' long by 5' high by 2' thick, weighing about 3 tons, fell from the side on to him. At the time of the accident both the overman and the sirdar were out of the mine. The gallery moreover was not one which should have been used for travelling purposes. It was 20' high and 20' wide, and in consequence of the excessive width the pillar showed signs of crushing and its side was soft and dangerous.

No. 75. Bhulanbarari Coal Company, Limited's Bhulanbarari coal mine.

A miner went through a fence and was injured by the fall of a corner of a pillar which he was robbing. He had only worked at the mine for two weeks. The inspector who investigated the accident was of opinion that no experienced miner would have dared to work at this place, and requested the officials to see that inexperienced coolies are not permitted to work alone.

The accident occurred at 8 P.M. The colliery doctor, who is an L.M.S. (Calcutta), was called to the injured man, but refused to attend, as he had fever. He visited him next morning and found him dead, his spine having been fractured. The doctor was dismissed.

No. 76. Babu Ram Krishna Tewari's Parsatari mica mine.

The mine consisted of an open excavation, 16½' long × 8' wide × 15' deep, out of which three inclined drifts had been driven along the vein of mica for short distances and in different directions.

The material out in the drifts was conveyed to the surface by sixteen men and women, standing close together inside the excavation and passing the baskets from hand to hand. Without any warning a pane of decomposed pegmatite, measuring 8' square × 12" thick, became detached from the west side and fell upon them. Several were knocked over and two were killed.

The unsound condition of the affected side was probably visible before the fall, or, at any rate, could have been readily detected by "sounding" days before the fall. No examination, however, appears to have been made by anyone and consequently no one knew of its condition. There was every reason for a careful examination, for a large fall of side adjacent to the fall in question had occurred only three days previously.

Failure to properly examine the side and report upon its condition was a violation of rule 3 made under section 20 of the Indian Mines Act for manganese, mica and limestone mines and failure to slope, step or secure the side in such a manner as to prevent danger from falls of material was a violation of rule 19. It was only because these rules had been in force for a very short time before the accident, that no prosecution was taken in this case, but owners and managers of mines regulated by these rules must from now realise their new responsibilities and take the necessary precautions.

IN SHAFTS.

No. 84. Saltore Coal Company, Limited's Saltore coal mine, No. 3 shaft.

The singular circumstances attending this accident are of special interest just now when deep sinkings, necessitating the use of large sinking pumps, are becoming common in the coalfields.

Two massive steel girders buckled, while supporting a heavy steam pump in a sinking shaft, 512' deep, and demolished the brick work in which they were embedded, a portion of which fell down the shaft and struck two men, who were standing in the bucket at the time, attending to the pump. One was killed outright and the other died two days later.

Plan D illustrates the positions of the girders before and after the accident.

The girders were of standard section, 18" x 7". One was 19' long and the other 23' long, but they both had the same span, *viz.*, 16 feet, being embedded in the brick pillars supporting the pit bank, which had been partially cut away to receive them. These pillars were situated one on each side of the shaft opening and were 6' 9" wide. The girders from web to web were placed 4 feet apart, the short one being fixed 1' 5½" from the shaft side of the pillars and the long one 1' 3½" from the other side. Four 10" x 5" girders were bolted to the top flanges of the main girders to carry the pulleys.

The pump was of the usual sinking type, 21" x 24" steam, 10" x 7¼" ram, capable of raising 11,000 gallons per hour, and was freely suspended in the shaft by two 1½" steel wire ropes, which passed over the pulleys to two hand winches, situated 22' away. The dead weight on the pulleys amounted to 12 tons 1 cwt., the pump and suction pipe alone weighing 4 tons.

The apparatus had been in use for seventeen days when the accident occurred.

On the night of the accident the pump began to give trouble; it would not take hold of the water. On opening the suction valve the rubber was found to be defective. This was renewed but without effect. The retaining valve was next opened and also found to be defective. A new valve was put in and the pump was restarted. It continued to work satisfactorily until shortly before the accident when the deceased, who were in attendance at the pump, signalled for steam to be shut off. A few minutes later they signalled for steam to be put on and almost immediately had it shut off again. Shortly afterwards, when steam was again put on in answer to their signals, there was a loud report at the pit top and, on going to ascertain the cause, it was found that the girders had buckled badly to a maximum deflection of 25⅞" in one girder and 14" in the other, and that the brickwork intervening between the girders and the sides of the pillars had been ground out by the turning movement of the girders.

It is obvious from the foregoing that the girders had been subjected to a sudden and severe shock, for they had been in use under the same constant load for over a fortnight. It was known that nothing of a heavy nature had fallen down the shaft and struck the pump. An examination of the pump, which, however, could not be made until a month later, owing to the water having risen, disclosed the fact that the snifting cock had been removed because it was damaged and had been replaced by a solid plug, and also that the delivery valve cover joint had blown out. The manager thinks the cock was removed by one of the deceased just before the accident.

The use of the snifting cock is to regulate the feed of air to the air vessel. Its replacement by a solid plug would rob the delivery column of the cushion necessary to prevent shock being transmitted to the pump at each stroke, and surging strains of a severe character would be set up in the whole suspension system. This is what appears to have happened; the strain set up exceeded the limit of elasticity and resulted in deformity of the structure.

In all sinking pump suspension systems there are repeated variations of load on the supporting structure, and it is well known that such cause failure at a lower strain than when the load is steady and without variation.

The girders in this case were each capable of bearing a safe load applied vertically at the centre of the span of 20 tons, or 40 tons for both. It will be seen by reference to the section that the resulting strain was applied in a direction that tended to overturn the girders, which it finally succeeded in doing, and further that it was applied in a direction that very greatly minimised their resisting power. This resulting force was equivalent to a load of about 19 tons, calculated on the dead weight alone of the suspension system. The turning moment was therefore great and the bearing surface on the brickwork comparatively small.

It is often difficult to arrange the supporting girders at a sinking shaft in a manner different from the way in which these were arranged, but all the additions to strength given below can generally be readily applied :—

- (1) Reduction of span.
- (2) Stout struts fixed in the direction of resultant force.
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- (4) Rivetting sole pieces of wrought iron of substantial size to the bottom flange of the girders near their ends to increase the bearing surface.
- (5) Laying the girders so that the bottom flanges do not come in contact with the outer face of the brickwork.

Since the accident girders of the same section, each 23' long, have been fixed and occupy much the same position as the old ones, but all the strengthening additions enumerated above have been made.

It may be mentioned that by a suitable arrangement of pulley blocks the strain on the winches in such cases may be considerably reduced.

No. 86. Central Kurkend Coal Company, Limited's Central Kurkend coal mine.

A pump and three ranges of pipes were supported in a sinking shaft, 239 feet deep, by a steel rope, one end of which was fastened in the head-gear, the other passing to a winch. A portion of the weight was carried on a baulk of timber at the surface, the remainder being on a steel rail 90 feet below the surface. The ends of the steel rail rested in hitches in the shaft walls and were built in with brickwork. The whole suspension system was tied together by six clamps, two at the surface, two just above the steel rail and one each, respectively, about 50 feet above and below the steel rail. These clamps had apparently been screwed up tight when the pipes were cold. When steam was turned on, expansion took place, and the brickwork securing the ends of the girder became loosened to such an extent that the vibration set up by the working of the pump dislodged a brick, which fell down the shaft, whilst the head fitter and another man were working on the pump platform. The latter was struck on the head and killed on the spot.

The accident appears to have been due to failure to appreciate the fact of the expansion of iron when subjected to heat.

SUFFOCATION BY GASES.

No. 91. Assam Railways and Trading Company, Limited's Tikak coal mine.

At this mine a seam, 75 feet thick and extremely liable to spontaneous combustion, is being worked in three successive stages on a system of "chambering." The workings are ventilated by a Schielé fan, 15 feet in diameter. At a point $1\frac{1}{2}$ miles in from the entrance to the workings a level road was being driven in the bottom coal to recover an area of coal which had been abandoned after an explosion just a year previously. Near the face of this road there is a small dip road or "chori", formerly connected with a "chamber" below, which had been exhausted two or three months before and dammed off. The rib between this level road and the "chamber" is 36 feet thick. The dam is said to have consisted of 14" brickwork, 3' sand and 9" brickwork plastered.

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On the day before the accident the European assistant foreman in charge noticed that the plaster on the face of the dam was cracked and gave orders for replastering. He stated that there was no sign of heat or gas. Early next morning a party, led by the head sirdar named Bahadur, and a mason, named Mahadev, went to the spot. Bahadur and Mahadev went down the "chori" to the dam 18 feet below and remained there for about three quarters of an hour. The plastering was nearly finished when their lamps were suddenly extinguished by blackdamp. Bahadur managed to get out on to the level, but went in again to assist Mahadev and both men lost their lives. The gas accumulated so rapidly that it was not until seven o'clock in the evening that it could be cleared by the air current and the bodies recovered. Subsequent to the accident more or less sudden inbursts of blackdamp occurred from time to time. Pronounced fissures were found traversing the coal near the dam, and in these blackdamp could always be detected.

Of the several theories put forward to account for these inbursts, the most probable is that the gas came through fissures from an old road in the bottom coal which was connected to old workings. From an old plan it was found that an old road, which was thought to be in the top coal workings, is actually in the bottom coal. This old road is probably very close to the face of the new road and it seems likely that the blackdamp came from it through fissures in the coal. The following points appear to call for remark:—(1) The plan was inaccurate. Had the existence of the old road been realized, precautions would probably have been taken to drain off the gas by boreholes. (2) Owing to leaky stoppings, the ventilation in the district was not sufficient to cope with a small inrush of blackdamp.

HAULAGE.

No. 100. Auckland Coal Company, Limited's Nudkhurki coal mine.

A train of 20 empty tubs was about to be lowered down a haulage slope. The deceased took out the sprag from the leading tub, shouted out an order to lower the train, and then proceeded down the incline to open the drop-gate 75 feet below. Unfortunately a coupling had been missed and the first three tubs ran wild and crushed deceased against the gate. He died next day. The accident might have been avoided if the drop-gate had been of a balanced type-capable of operation from one side of the line. It is, however, much better to dispense with drop-gates as a precaution against runaways and to use an appliance such as a "cut rail" or "kick up" operated from the top of the slope by means of a lever with a rod or wire. The former is preferable, as it can be made to lead the runaway tubs into a catch siding and so save broakage.

No. 108. Khas Jharia Coal Company, Limited's Khas Jharia coal mine.

Owing to the breakage of a rope capping five loaded tubs ran wild on a dip haulage slope. Deceased was run over and killed on the spot.

The rope had been at work for two years and showed such signs of wear that the load had been reduced from 10 to 5 tubs two months before the accident. The capping which broke was one of a pair of cappings which had been put on midway in the rope and which had worked for some six weeks. In such a position cappings are subject to great wear and liable to be torn open by catching in crossings, rollers, etc. Except as a temporary expedient, pending the running in of a splice, their use cannot be considered prudent.

Inquiry disclosed the fact that although the manager had indented for a new rope on the 28th March it was not ordered by the agent until the 5th May and only received at the mine on the 6th June. This delay should not have occurred. Owners and agents should see that managers are supplied with new material within a reasonable period of indent. A new rope should be ready in stock before the end of the life of an old rope.

No. 111. Vizianagram Mining Company, Limited's Kodur manganese mine.

Owing to the failure of an incline attendant to pull over the safety stop, after the arrival of a train at the top of a haulage slope, a loaded tub ran wild and a woman was killed. The accident would have been avoided if a catch siding or automatic stop chock had been in use. Inquiry also disclosed the fact that there was no drag or hook bar and that the buffer stop was inadequate.

No. 113. Lakorka Coal Company, Limited's Lakorka coal mine.

Whilst a train of fifteen tubs was being started from the top of a haulage slope a coupling hook fell off and four tubs ran wild. Deceased who had just entered the arching on his way underground was knocked down and died two hours later.

The accident would have been avoided if a catch siding or automatic stop chock had been in use.

Inquiry disclosed the fact that the manholes were not within the proper distances, and a prosecution was instituted against the manager. This case is still pending and will be referred to in section IV of the next Annual Report.

No. 115. Lutchipur Coal Company, Limited's Panchgatchia coal mine.

Whilst a train of five tubs was being lowered on a haulage slope, the front tub became uncoupled and ran wild. Deceased was run over and received injuries from which he died five hours later. The line was far from straight and the grade was so uneven that the tubs were checked and bumped against one another. There was a great deal of loose coal lying on the road. The tubs were of two or three different types and in poor repair. Some had closed drawbars and others drawbars ending in hooks. These were at different heights above the rails. The couplings consisted of three links and a hook and were much too long. The accident was due to the numerous defects detailed above and was clearly preventable.

No. 119. New Manbhumi Coal Company, Limited's Dhundabad coal mine.

A violent blast, produced by an extensive fall of roof, dislodged a rail 11' 6" long and weighing 52 lbs., which was supporting the shaft bottom protection sheets, and hurled it a distance of 32 feet. In its flight it struck a woman, who was filling a tub at the time, on the head and killed her outright.

The accident, which is illustrated by plan C, serves to bring into prominence the serious consequences to the life and value of a mine that almost inevitably follow the formation of small pillars in the first working or of pillars whose ultimate crushing strain is but slightly greater than the pressure exerted by the weight of the superincumbent strata.

In a district of the mine where the cover varies from 100 to 150 feet thick, and is composed of alternating shales and sandstones, the seam had been cut up into pillars some years ago. At the time of the accident these pillars ranged in size from 100 feet square to 30 feet square by 18 feet high. Goafing had recently been started and 19 pillars had been extracted in the usual manner, when weighting of the roof began to assert itself in a mild form. The work-people were withdrawn and precautions taken generally to protect the work-people in other parts of the mine from being exposed to the effects of a sudden and dangerous development of this condition.

After the lapse of a fortnight a change took place and imminent collapse seemed certain. All the work-people were removed from that side of the mine and told to work on the other side of No. 1 pit, 700 feet away. This order was obeyed. That night the roof over the goaf collapsed and so strained the adjoining roof that the pillars under it, numbering 103, were unable to with-

stand the added pressure and gave way, causing the roof to subside over an area of about 160,000 square feet and affecting the surface over a similar area, which resulted in damage being done to 57 huts.

Many persons in the mine were blown over and all the lamps were extinguished with the exception of one, by the aid of which the people found their way to the surface. Two men sitting under the protection sheets had a narrow escape.

Extensive pillar robbing had been practised in the past and so reduced some of the pillars that it was not safe to take them out. The fact that they had been so reduced in size assisted in the general collapse.

Large areas have been goafed in other parts of this mine. The subsequent falls have been confined to these areas and have not extended over the standing pillars. This no doubt led the manager to assume that the weight would be similarly restricted in this case also. The event however is one more proof that when pillars of small size are being goafed sudden subsidence over an area exceeding the area goafed should be anticipated, and in such cases, all persons should be ordered out of the mine when the goaf roof begins to show signs of collapse.

It is only fair to the present manager to state that neither the formation of the pillars nor the pillar robbing occurred in his time.

No. 127. Bansilal Ambireband Mining Syndicate's Kochkurie manganese mine.

This accident occurred on a tramway which is six miles in length. The rails weigh 14 lbs. to the yard and are laid to a gauge of 2 feet. Traction is by hand and the grade, though undulating, is mainly in favour of the load.

Deceased was one of a party of persons who borrowed a trolley from a loading foreman and were travelling on it after dusk without lights. At the bottom of an undulation in the grade the trolley collided with a train of four loaded tubs, which was being propelled in the opposite direction by eight tubmen, also without lights. The other passengers jumped clear, but the deceased was caught between the tubs and the trolley and received injuries from which he died two hours later.

Rules under section 21 of the Indian Mines Act, 1901, for the regulation of traffic on tramways in and about manganese mines are under consideration.

NOT INCLUDED IN STATISTICS.

No. 8. New Beerbhumi Coal Company, Limited's Borra coal mine.

This case is important to owners and managers who have abandoned shafts on their properties. A person of unsound mind ran out of his hut, and was pursued by his relatives. He came to the top of an abandoned shaft, 35 feet deep, lying in a remote part of the company's property. The top of this shaft was unfenced and he either fell or jumped down it. He was killed instantly. As the tops of all shafts are required by rule to be fenced, a prosecution was instituted against the manager, as referred to in section IV of this report.

No. 14. Babu Umed Bhai Patel's Egarcour coal mine.

This accident occurred in the Mugma section of the Raniganj coalfield, through the management neglecting to warn the occupants of a hut which had been undermined. Two pillars of coal had been extracted under a cover of 7 feet of coal and 15 feet of decomposed sandstone and soil, on which a hut, containing seven persons, was standing. Early in the morning, before all the occupants were awake, the cover subsided to a depth of 7 feet over an area of 1,600 square feet and the hut was precipitated into the depression and completely demolished. A child aged one year was killed outright, its mother sustained a simple

fracture of her arm and another child a simple fracture of the thigh. The rest escaped unhurt.

This is the first time goafing has been done in the Mugma district and its full effects were not realized.

Whenever goafing is done at a shallow depth collapse of the surface is inevitable. Notice of impending danger should always be given to the occupants of houses likely to be affected by subsidences, and where possible evacuation insisted on.

Section IV.—Prosecutions and additions to the Act.

(a) PROSECUTIONS.

The following prosecutions which have been completed were instituted during the year or were instituted after inspections made during the year :—

In the last Annual Report an account was given of a fatal accident by fall of roof at the Royal Bengal Coal Company's Kusumkanali coal mine, by which three persons were killed. It was stated that proceedings had been instituted against the owner and the agent for not supporting this roof and also for not fencing unused galleries. These omissions constituted breaches of rules 3 and 7 made under section 20 of the Indian Mines Act. The cases were eventually taken against the owner as agent and against the manager under sections 221 (e) and 3 (e) read with the above rules. In view of the fact that the accident had entailed serious loss upon the owner, the cases were not pressed. The agent was fined Rs. 20 or two months' simple imprisonment and the manager was fined Rs. 50 or two months' simple imprisonment.

The owner and manager of Babu Bireswar Roy's Ramkanali coal mine were prosecuted under section 22 (e) read with rule 7 made under section 20 of the Indian Mines Act for neglecting to fence unused galleries. The owner pleaded that he was unaware of the fact that these galleries were unfenced. He had however been previously warned. He was fined Rs. 30 or two months' simple imprisonment. The manager was fined Rs. 60 or three months' simple imprisonment.

The manager of the New Beerbhum Coal Company, Limited's Borrea coal mine was prosecuted under section 22 (1) (e) read with rule 19 made under section 20 of the Indian Mines Act. This case arose out of the fatal accident described on page 24 of this report. It was pointed out by the Court that it could not be proved that death was directly due to the breach of the rule. The complaint was therefore amended and taken under section 22 (3) (e). The judgment was as follows:—"In this case the facts are admitted. The accused was manager of the Borrea colliery and on the 19th March a man, said to be insane, was killed by falling or jumping down a shaft on the colliery which was unfenced. The manager is therefore liable under sections 14 and 22 (3) (e) for a breach of the rule requiring all shafts to be fenced, unless he exonerates himself under section 14. He has not attempted to do so, and in fact says that he did nothing in the matter before the accident because he was only aware of the existence of the shaft (which is disused, and unconnected with any other workings) by his plan and that he had never visited the shaft during his tenure of the post.

"The only question is then what degree of negligence is shown, and consequently what penalty should be imposed. The prosecution admit and even emphasise the fact that the manager, as far as his general work is known to them, is one of the most careful and competent men: the accused's statement (nothing in which is contradicted) shows that the shaft is one which has been disused for many years, is not connected with the mine proper, is in a lonely place, not near any habitation or road, and to the extreme north-west of

the colliery, 300 or 400 yards from the nearest surface working. He further says that he had a special man some time ago to fence all unprotected places, and that this shaft must, for reasons above given, I suppose, have been omitted by an oversight.

“The case shows that managers, however careful they may be in other respects, do not yet realise to the full their responsibility towards the general public, as opposed to their own employes : their attention is (no doubt) actually directed merely to the safety of their working and shafts in use : it may be admitted that only an insane person or an intending suicide would be likely to fall down a shaft of the kind described above, but the necessity for ensuring its safety so far as is possible remains. For this reason I do not think it is desirable to impose a merely nominal fine : but taking the professional character of the accused into consideration and the undoubted fact that the shaft in question was one which was likely to be overlooked, unless more systematic inspection of all parts of collieries were made than is at present the case, I fine him Rs. 30 under the section above mentioned.”

The owner of Munshi S. Woomerali's Egarcour coal mine was prosecuted under section 22 (3) (e) read with rules 4 (b), 9, 22 and 23 made under section 20 of the Indian Mines Act for failing to keep a daily report, plan of workings, ambulance appliances and all rules made under the Act, and also under section 13 (1) of the Act for working the mine without a qualified manager. He had been repeatedly warned. He pleaded guilty, and was fined Rs. 100 or one month's simple imprisonment.

The agent and manager of the Panjab and Bengal Coal Company, Limited's Burragarh coal mine were prosecuted under section 22 (3) (e) read with rules 7, 8 and 9 made under section 20 of the Indian Mines Act, for failing to fence unused galleries, for not providing signals and manholes on haulage planes and for not keeping an accurate plan of the workings. Both pleaded guilty. Each was fined Rs. 20 or one fortnight's simple imprisonment.

The managing owner and manager of the Bansdeopur Coal Company's Bansdeopur coal mine were prosecuted under section 23 (3) (e) read with rules 8, 19 and 20 made under section 20 of the Indian Mines Act, for failing to provide signals on haulage planes, for not fencing the top of an incline and for not fencing a winding engine and a hauling engine. The manager pleaded guilty, and was fined Rs. 50 or one month's simple imprisonment. The case against the owner was withdrawn.

A colliery mate working at Mohpani coal mine was prosecuted by the manager under section (22) (3) (e) read with rule 17 (b) made under section 20 of the Indian Mines Act for unlocking a safety lamp at a place other than the appointed lamp station, and was fined Rs. 10.

At the same coal mine a miner robbed a pillar. He was prosecuted under section 336 of the Indian Penal Code, and was fined Rs. 15.

Four permits granted to managers of small mines were cancelled during the year on account of mismanagement disclosed by inspections.

(b) ADDITIONS TO THE ACT.

Rules made under section 20 of the Indian Mines Act applicable to mines for manganese, mica and limestone were gazetted by the Government of India in the Department of Commerce and Industry in Notification No. 6436-152, dated the 2nd September 1911. These appear in Appendix IV, Statement 6. These rules are now bound up with rules applicable to all mines in one book. A similar book has been prepared for rules applicable to coal mines. Each may

be obtained from the Superintendent of Government Printing, India, 8 Hastings Street, Calcutta, at a price of two annas a copy.

Section V.—General Remarks.

HEALTH AND SANITATION.

A committee, known as the Jharia Sanitation Committee, controls operations connected with sanitation in the Jharia coalfield. The Deputy Commissioner of Manbhum is the Chairman, and the committee is composed of certain *ex-officio* members, representative colliery superintendents and colliery medical officers. Two sanitary inspectors are constantly employed. The chief work which devolved on the committee in 1911 was the combating of plague, the first case of which occurred on the 23rd September in the Jharia bazar. A special European medical officer was engaged, who took charge of all preventive measures within a radius of two miles from the bazar. A professional rat catcher was employed and rat catching was instituted on an extensive scale, and one of the sanitary inspectors was deputed to devote his whole time to the Jharia bazar. There has been no case reported from Jharia since the 26th December 1911, but the disease spread to the villages of Dhanbaid, Gobindpur and Chirkunda, the latter of which is in the Raniganj coalfield, but all of which are in the Dhanbaid Sub-Division. These villages are outside the scope of the work of the committee. Altogether there were 78 deaths, 12 of which occurred in Jharia, 3 in other parts of the coalfield, 20 at Dhanbaid, 18 at Gobindpur and 25 at Chirkunda and neighbourhood. The last case of all reported was on the 29th March 1912 at Chirkunda.

Eight meetings of the committee were held during the year. The expenditure incurred is borne by the Local Government, the Indian Mining Association and the Rajah of Jharia in equal shares. The committee will cease to exist when the Bengal Mining Settlements Act (Act II of 1912) is put into force.

An epidemic of pneumonia broke out at Sukli manganese mine in the Central Provinces and, owing to the frequency of attacks, the disease was suspected to be pneumonic plague. Microscopic examination tended to confirm this. By means of segregation and the burning of huts in which the disease made its appearance, it was soon stamped out.

An outbreak of cholera occurred in September at Jamadoba coal mine in the Jharia coalfield. A workman was attacked and was taken home, his death taking place the same day.

On inquiry it was found that this man had been drinking soda water purchased in the Bhaga bazar. The remaining contents of the bottle from which he had been drinking was analyzed by the Company's medical officer, Dr. Simpson.

The result of the analysis in Dr. Simpson's own words is as under :—

“The resultant analysis reveals a most terrible condition of affairs, and of all the unfiltered effluents of mines, tanks and rivers that I have examined, none have given such a result as this.”

The hookman evidently contaminated the mine water from which the Jamadoba filters received part of their water supply, as during the first week following the outbreak, wherever there was a filtered water hydrant, cholera broke out. When this was discovered, the filtered water was cut off, and the colliery people for about two weeks were supplied with water from wells. The filters were then thoroughly sterilized and treated with permanganate of potash, and for the two weeks during which the people were supplied with well water, the filtered water was allowed to run to waste so as to thoroughly disinfect the filters and pipes.

Altogether there were 46 seizures and 29 deaths, the last case being on the 15th October.

Since the outbreak only river water has been used in the filters. The water is pumped from the Damuda River, a distance of 2 miles from the filter plant, by electrically driven three throw pumps.

The plans drawn up by the Sanitary Engineer, Bengal, for a water supply to the Jharia coalfield have been completed and are under consideration.

There was an outbreak of cholera in the Kodarma mica field in April. From inquiries it was found that 141 deaths occurred at the mines. Most of the labour, however, returned to their villages and the general opinion among the leading mine officials is that the total death roll was not far short of one thousand.

There was an outbreak of cholera at the Rajhara coal mine in the Palamanu district, in Bengal, resulting in 10 deaths and at Kalichedu mica mine in the Nellore district in Madras, which is reported as slight.

Malarial fever has been in evidence among the miners at the Cape Copper Company, Limited's mines in Singhbhum; the Hingir-Rampur Coal Company, Limited's coal mine in Sambalpur; the Central Indian Mining Company, Limited's Junawani manganese mine in Nagpur; the North-Western Railway Company's Khost coal mine in Baluchistan and the North Anantapur Gold Mines, Limited's mines in Madras.

With the above exceptions the reports received on the health of miners are very satisfactory.

The total rainfall at Jealgora in the Jharia coalfield was 41.82 inches. At Sitarampur in the Raniganj coalfield it was 54.48 inches, being 3.39 inches in excess of the previous year. Rain fell here on 87 days, and was not so well distributed as in the previous year. On six days it exceeded two inches. At Giridih the rainfall was 50.51 inches, rain falling on 72 days.

AMBULANCE WORK.

As foreshadowed in the last Annual Report, the scheme for placing ambulance work throughout the Bengal coalfields on a permanent basis has become an accomplished fact. An influential Central Committee has been formed to direct and control the local centres. It is constituted as follows:—The Chief Inspector of Mines in India (President), Messrs. R. J. Browne and S. Heslop (Vice Presidents), the Collector of Burdwan, the Deputy Commissioners of Hazaribagh and Manbhum, the Sub-Divisional Officers of Asansol and Dhanbaid, the Inspectors of Mines in India, Messrs. T. Adamson, A. A. Agabeg, F. J. Agabeg, R. G. M. Bathgate, E. S. Bennertz, H. M. Bull, G. Crawford, Glen George, W. Hutton-Williams, J. S. Kean, P. S. Keelan, G. C. Lathbury, J. Mackintosh, W. McFarlane, G. Miller, R. Mitchell, C. Nairne, F. Owen, E. M. Patterson, W. J. Rees, A. S. Thomson and J. J. Turnbull.

Well attended meetings have been held to lay down the broad lines of organisation that should give effect to the determination of the industry to provide for the instruction in "First Aid" of the officials employed at the mines. It was agreed that the first necessity was the possession of funds, chiefly in order that the services of lecturers and examiners could be recognised and accordingly an appeal was made to all colliery owners for subscriptions. This met with a very generous response, the sum of Rs. 1,840 being received. I have pleasure in appending a list of the subscribers to the fund:—the Maharaja of Cossimbazar, the Raja of Jharia, East Indian Coal Company, Limited, Messrs. F. W. Heilgers & Co., H. V. Low & Co., Apcar & Co., Macneill & Co., Turner, Morrison & Co., Martin & Co., Mackinnon, Mackenzie & Co., Balmer Lawrie & Co., Shaw, Wallace &

Co., Andrew Yule & Co., Kilburn & Co., Bird & Co., Burn & Co., Sutikdih Coal Company, Limited, Bulliari Coal Company, Sitarampur Coal Company, Limited, Williamson, Magor & Co., Octavius Steel & Co., McLeod & Co., Baraboni Coal Concern's Chinchuria Colliery, Tata Iron and Steel Company, Limited, Agabeg Brothers, Babu J. R. Agarwalla's Fatehpur Colliery, Anderson, Wright & Co., Pandeybera Colliery Company, Bansdeopur Coal Company, Mr. Khora Ramji's Bulliari Coal Mines, Babu Bhola Nath Chatterji's Haripur Colliery and the Searsol Rajbati.

I trust this list will be augmented in future by the inclusion of the names of more private owners, as a considerable increase in the funds will be required if a knowledge of ambulance work is to be placed within the reach of all subordinate officials.

Through the kindness of the Commandant of the Chota Nagpur Light Horse, a grant-in-aid of Rs. 7 per head was sanctioned for all efficient members of the corps in the current year who obtain certificates of proficiency at the classes.

Mr. S. Heslop, past President of the Mining and Geological Institute of India and Superintendent of the New Beerbhum Coal Company, Limited, has very kindly offered a challenge shield to be competed for by teams from the various centres. This will have a good effect in arousing keenness and raising the standard of efficiency.

Ten classes have been started, *viz.*, two at Dishargarh, three at Charanpur, two at Jharia, one at Sijua, one at Raniganj and one at Mugma. Instruction is still in progress at Raniganj and Mugma where the classes are attended by 60 members. The other classes had a roll of 392 members of whom 122 sat for examination and 110 succeeded in gaining certificates of proficiency.

The examination of the class at Giridih since the issue of the last Annual Report resulted in the success of 22 candidates out of 25 examined.

A new and popular feature was introduced last session in giving instruction in the vernacular. Six lectures were delivered in Bengali and four in English.

Dr. W. P. O'Connor, Dr. F. T. Simpson, Dr. W. D. Williams, Baba B. G. Chatterji, Babu S. P. Gupta, Babu P. C. Biswas and Munshi S. Nurulatta kindly undertook the duties of lecturers, often at great personal inconvenience. Their efforts were much appreciated. Dr. E. Nicholl of the East Indian Railway Company's Medical Department conducted all the examinations and the successful candidates are to be congratulated on passing the severe tests he applied.

A good deal of the success attained is due to the special interest taken in the classes by Messrs. F. Owen, E. S. Bennertz and P. S. Keelan.

Preparatory classes under the control of the colliery managers, directed by sub-committees, are about to be started at the large collieries for the purpose of training sirdars and important workmen in the practical operations of stopping bleeding, fixing splints, tying bandages, carrying the injured and restoring the apparently drowned. The students will be admitted to the classes at the re-organised centres as soon as they have proved themselves efficient in this training.

SIBPUR COLLEGE MINING DEPARTMENT.

Mr. E. H. Robertson, the Professor of Mining Education at Sibpur College, has reported that the session of 1911-12 commenced with a total roll of sixteen students, of whom nine were studying Course I, three being special students (scholarship holders), and seven studying Course II, four being special students (scholarship holders). In Course I six students qualified to sit for the annual examination leading to Course II, and three only were successful, one being a special student. The other two special students, having passed in the mining subjects, were allowed to study in Course II, but, through failure in subsidiary subjects, could not qualify for the diploma.

At the diploma examination five were successful, one being a special student.

Various successes have been gained by old students during the past year, amongst which are the following:—General Managership of the Jharia Collieries, Limited, Managerships of the Burragarh Coal Company, Limited, the Angarpatra Coal Company, Limited, and the Gobindpur Coal Company, Limited; one student has been appointed prospector to a Native State, while others have been made or are acting managers of small collieries, or have obtained posts as surveyors. In the colliery managers' certificate examination, held this year one obtained a first class and two second class certificates.

Besides the usual routine work done by the students during the session, several analyses of different coals and essays of copper-bearing and other ores, and in one instance limestone, sent from different parts of India or Burma, were done and proved of utility to the various persons who sent them. The Department can undertake still more of this class of work, though of course, being students' work, no guarantee, time or otherwise, goes with it.

The lack of elementary education in the special students, who are holders of scholarships and who are recruited from the young employes in the mines, was brought last year to the notice of the Local Government in a report by the Professor of Mining. In a very few instances have the special students, though usually good at the mining subjects, been able to make up sufficient leeway in other subjects, such as mathematics, to qualify for the diploma. The Local Government and the Indian Mining Association, in whose joint gift the scholarships were, decided therefore to abandon them.

There were a considerably larger number of applications this year than formerly for these scholarships, and it is a significant fact that, on being informed that no scholarships were available, five of the applicants announced their intention of joining the college as special mining students without scholarships. Four, up to date, have done so, and have commenced attending the lectures. These young men have relinquished their means of livelihood for the next two years, and are paying their own way, in order to increase their efficiency in their walk of life. This is surely an indication that in the youth of the coalfields is awaking a strong and real desire for a sound education, and that if only the college were more accessible, considerably more, with probably a high average of keenness and intelligence, would come forward to take advantage of it.

A suggestion has been made that, in lieu of the special scholarships that have been abandoned, scholarships should be instituted in favour of students who have gained their diplomas, to enable them to go to England and spend two years as articled pupils in a mine. Such scholarships would only be awarded in the case of students, who have shown exceptional merit, and who are of a calibre that would profit by such a privilege. That such a scheme would be acceptable is borne out by the fact that two old Sibpur mining students have gone to England to enhance their qualifications, one having been sent by the company employing him, and one having gone at his own expense and obtained employment in a mine in Scotland as a working miner, while a third (the special student who gained his diploma this year), is on the point of sailing at his own expense to become articled to the manager of a colliery.

The above suggestion, which is not new, but was first mooted by Mr. W. H. Pickering, formerly Chief Inspector of Mines in India, should find favour in that scholarships, or "studentships," would be for practical experience only, and would be awarded only in cases of exceptional merit and promise.

The proposed removal of the mining department of Sibpur College, and its incorporation into a mining and technical institute at Asansol, or some other mining centre, is occupying attention at the present time, and appears to have obtained general commendation. The increased facilities of teaching a technical subject in the midst of a country full of examples of that subject are apparent to all; the fear of limitation of numbers due to want of accommodation would no longer exist; workers in the coalfields would have at hand a means of giving their sons a sound technical education, while the backbone of the institute would probably be the "special student" class,—men who do not fear to give up wholly or in part their employment, in order to qualify themselves for posts of higher responsibility.

MINING EDUCATION IN THE BENGAL COALFIELDS.

As stated in the last Annual Report, the lectures in the coalfields are now delivered by colliery managers who have been appointed by the Local Government for the purpose, on the recommendation of the Mining Educational Advisory Board.

The Board was formerly known as the Mining Advisory Board of the Civil Engineering College, Sibpur, but in 1911 its title was altered to that stated above, and it was reconstructed, its members now being as follows :—

- (1) The Chief Inspector of Mines in India, *ex-officio* Chairman ;
- (2) The Principal, Civil Engineering College, Sibpur ;
- (3) The Inspectors of Mines in India ;
- (4) The Professor of Mining Engineering, Civil Engineering College, Sibpur ;
- (5) Two representatives of the Indian Mining Association ;
- (6) The President of the Mining and Geological Institute of India, and
- (7) The Superintendent of Industries (*ex-officio* Secretary).

Certain powers were also conferred on it for the conduct of lectures and consequent examinations.

Two meetings of the Board were held during the year.

The lecturers appointed were as follows :—Jharia and Sijua Centres—Mr. S. McMurtrie, Charanpur Centre—Mr. H. C. Read and Dishargarh Centre—Mr. L. A. Jacobs.

The lecturers have reported that the total number of names on the registers for the session 1910-1911 was 237. The average number of students who attended the courses was a little greater than 20 per lecture, and 74 students (16 Europeans and 58 Indians) made 50 per cent. or more of the possible number of attendances, and thus became eligible candidates for the sessional examinations. These were held simultaneously at the four centres on the 2nd June 1911, the examiners being Professor E. H. Robertson and Mr. G. C. Leach. Of the 74 eligible candidates, 36 presented themselves and 18 (7 Europeans and 11 Indians) were successful in obtaining the necessary number of marks to qualify for certificates. With the exception of the total number of names, these figures are almost identical with those of the previous year, which was the last year in which the lectures were delivered by an official mining instructor, and in which there were 325 names altogether on the registers.

The examiners reported as follows :—

“ We are unable to state what the standard of past examinations has been and cannot therefore make any comparisons. Generally speaking, we consider that the examination has not revealed a very high standard of mining knowledge. The answers were wanting in detail, expression was faulty and the sketches were poor and few.

“ Arithmetical questions were in a great measure ignored, though they were not difficult which points to deficient elementary education.

“ These defects, we consider, would be remedied to a great extent by closer application to homework. However painstaking the lecturers may be, it is hardly to be expected that one hour's tuition a week will qualify a student for examination unless it is supplemented by private study, and this should be insisted on.

“ Notwithstanding the foregoing remarks we think there is no doubt that the classes are performing a very useful work in the coalfields.”

TRUE MERIDIAN LINES IN BENGAL COALFIELDS.

In the last Annual Report attention was drawn to true north lines, which had been laid down at six places in the Bengal coalfields. These have already proved of great service and, in order that those who do not live in their immediate neighbourhood may readily find them, their exact location is marked on plans E and F attached to this Report. I would again urge upon those

responsible for the accuracy of mine plans the necessity of having instruments checked periodically. They should be so checked at least once a year.

MINING AND GEOLOGICAL INSTITUTE OF INDIA.

The total membership of the Institute at the end of the year, including subscribers, was 290. Five meetings were held during the year, there being a large attendance at each. The Government prize for the best paper read during the year was divided between Messrs. C. H. McCale and S. McMurtrie. Branches, for the purpose of holding branch meetings for the reading and discussing of papers, have been formed for the Jharia and Raniganj coalfields, respectively.

BOARD OF EXAMINERS.

During the year a change occurred among the non-official members through the resignation of Mr. J. J. Turnbull, who was succeeded by Mr. R. J. Browne. The Board therefore consisted at the end of the year of:—The Chief Inspector of Mines in India (*ex-officio* President) and Messrs. S. Heslop and R. J. Browne. I take this opportunity of placing on record the valuable and appreciated service rendered to the Board by Mr. Turnbull, who was connected with it ever since its formation.

Five meetings were held by the Board during the year.

There were eight applicants for first class Indian certificates of competency in lieu of English certificates, all of whom were furnished with Indian certificates.

An examination for certificates of competency as colliery managers was held at Dhanbaid in the office of the Department of Mines on the 23rd and 24th February 1911, at which 31 candidates competed for first class certificates and 51 for second class certificates. Out of the above numbers, only 3 were successful in obtaining first class certificates and 6 in obtaining second class certificates.

The non-official examiners at the above examination were Messrs. G. F. Scott and R. J. Browne, Mr. R. R. Simpson being the official examiner.

MINING BOARD.

No meetings of the Mining Board were held during the year.

OFFICIAL DUTIES IN 1911.

Mr. G. F. Adams was Chief Inspector of Mines in India.

Mr. R. R. Simpson was Inspector of Mines for No. 1 Circle.

Mr. G. C. Leach was Inspector of Mines for No. 2 Circle. From the 1st January till the 7th March 1911 he had charge of No. 3 Circle in addition to his own duties. He had 14 days' privilege leave, from the 13th till the 26th September.

On the 8th March Mr. C. J. E. David was appointed Inspector of Mines for No. 3 Circle.

During the year the Circles of the Inspectors of Mines were rearranged, as shown in Appendix IV, Statement No. 1.

Fifteen inspections were made, for various reasons, at mines which are not regulated by the Indian Mines Act. These are excluded from Appendix I, Table 1.

I have the honour to be,

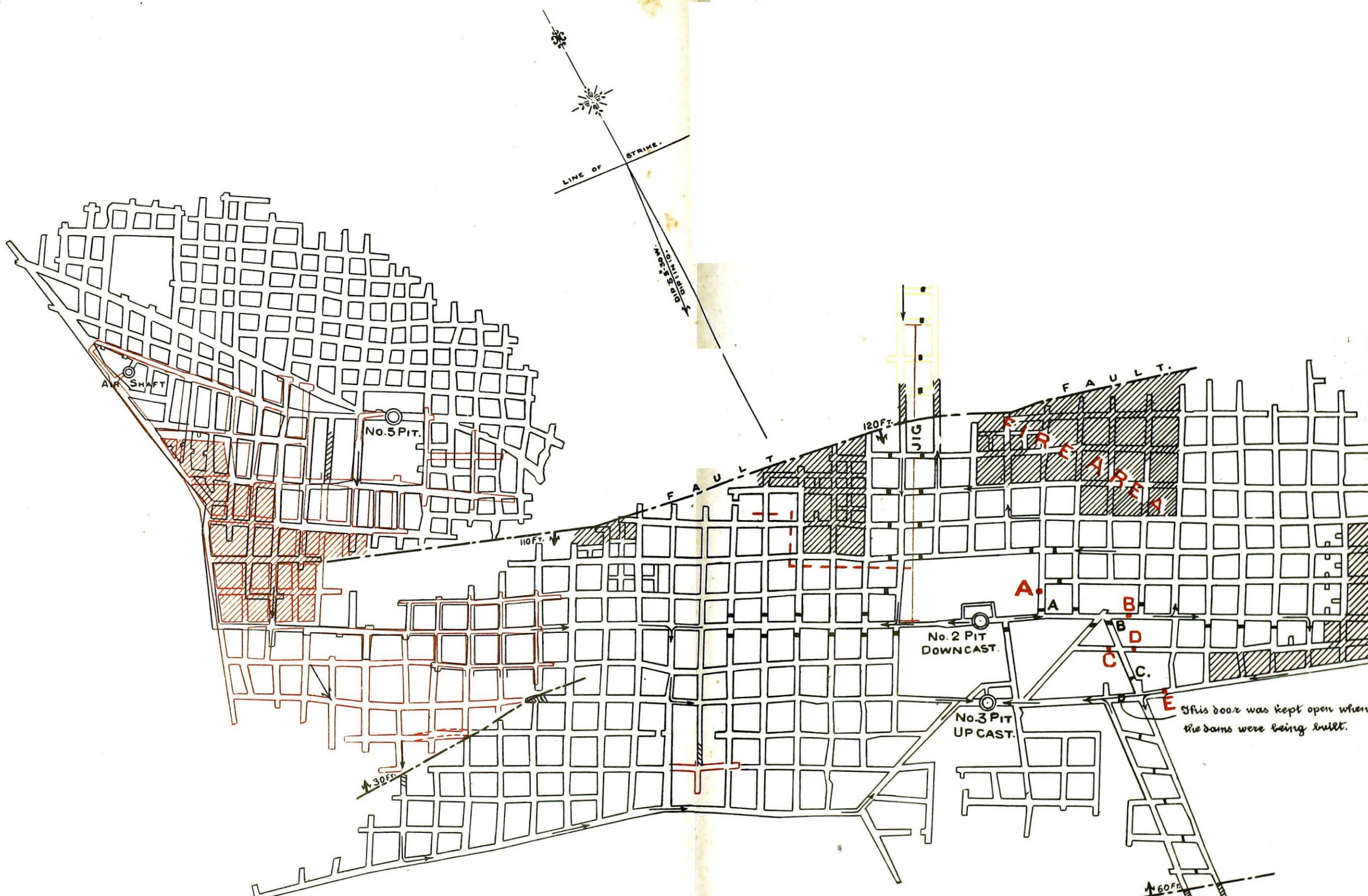
SIR,

Your most obedient servant,

G. F. ADAMS,

Chief Inspector of Mines in India.

PLAN ILLUSTRATING
EXPLOSION AT KENDWADIH COAL MINE
 SHOWING WORKINGS IN Nos. 11, 13 & 14 SEAMS
 SCALE 1 INCH=200 FEET.



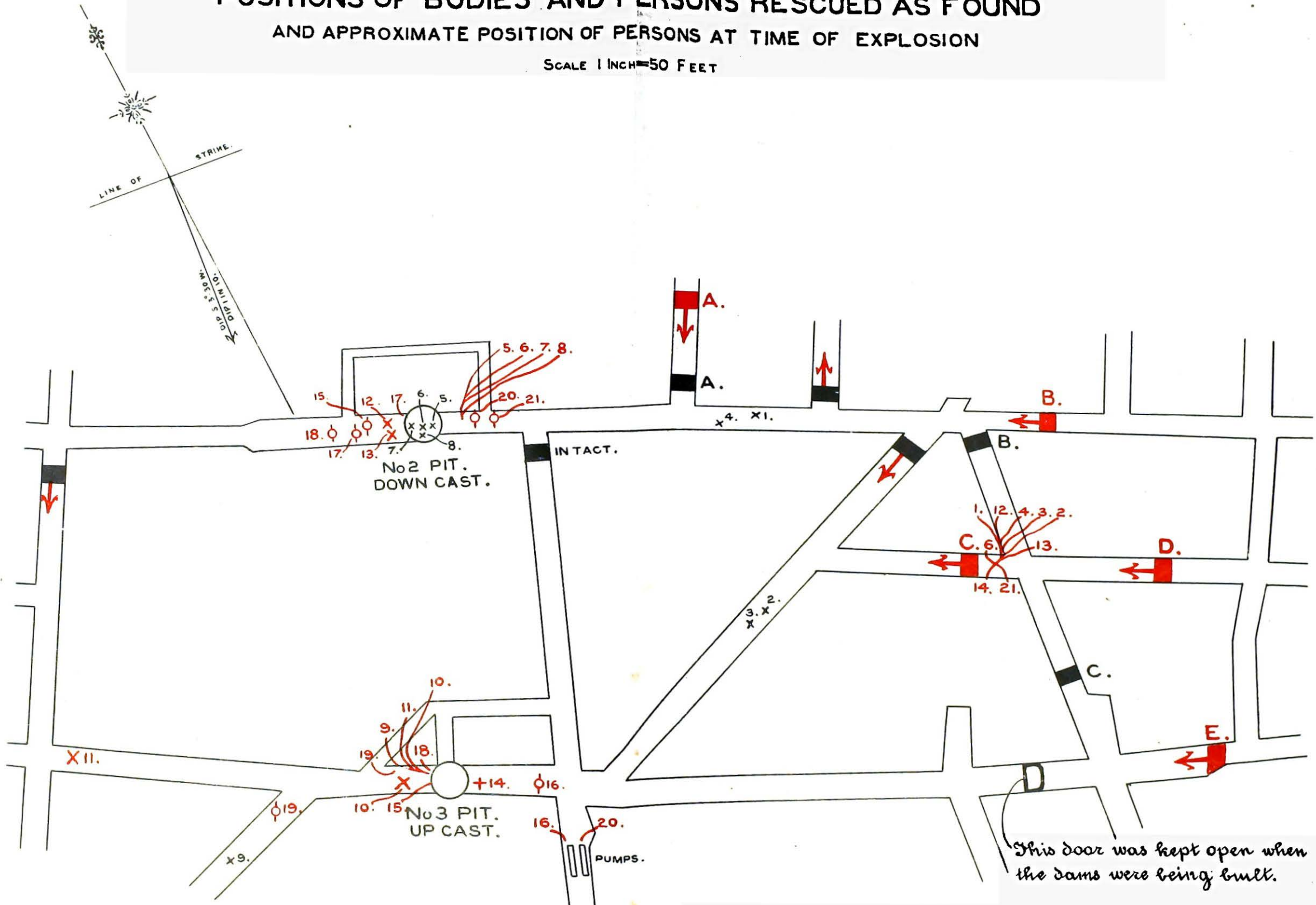
REFERENCES.

- No. 13 seam workings shown in black.
- No. 14 seam workings shown in red.
- No. 11 seam workings shown in yellow.

- Old stoppings.....
- New stoppings erected.....
- New stoppings which would have been erected.....
- General air current.....
- Drifts.....
- Old stoppings were all 15 inches thick.
- Area Goafed.....

PLAN ILLUSTRATING EXPLOSION AT KENDWADIH COAL MINE SHOWING STOPPINGS NEAR Nos 2 AND 3 PITS, DIRECTIONS OF FORCE, POSITIONS OF BODIES AND PERSONS RESCUED AS FOUND AND APPROXIMATE POSITION OF PERSONS AT TIME OF EXPLOSION

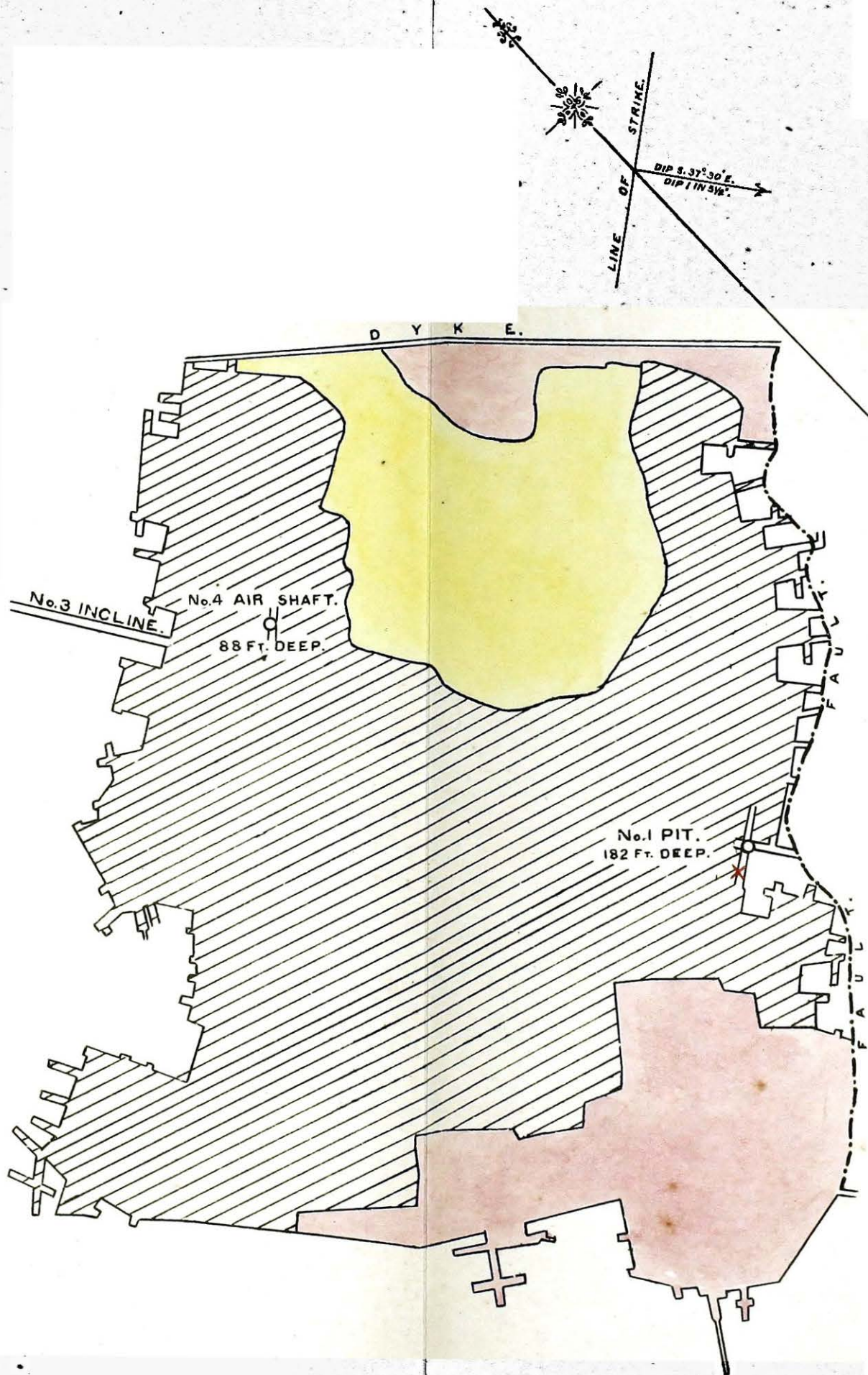
SCALE 1 INCH=50 FEET



REFERENCES.

- New fire stoppings shown in red. ■
- Old ventilation stoppings shown in black. ■
- A ■ 12'X8'X2' Brick in mud.
- B ■ 10'X8'X4' Brick in mortar.
- C ■ 13'X9'X2' Brick in mud.
- D ■ 13'X11'X4' Brick in mud.
- E ■ Kerosene tins filled with sand.
- A ■ 5 ft. high in gallery 10 ft. high. Taken out on the 7th.
- B ■ Taken out on the 8th.
- C ■ Taken out on the night of the 8th.
- Old stoppings were all 15 inches thick.
- Directions in which stoppings were blown. →
- Position of bodies. X 1 to X 9
- Position of persons rescued who died subsequently. + 10 to + 14.
- Position of persons rescued who recovered. φ 15 to φ 21.
- Approximate position of persons when explosion occurred as far as the evidence is available. 1. 2. 3. etc.

PLAN ILLUSTRATING
FATAL ACCIDENT BY AIR-BLAST
 AT
THE NEW MANBHUM COAL Co, LTD'S DHOONDABAD MINE.
 SCALE 1 INCH = 200 FEET.



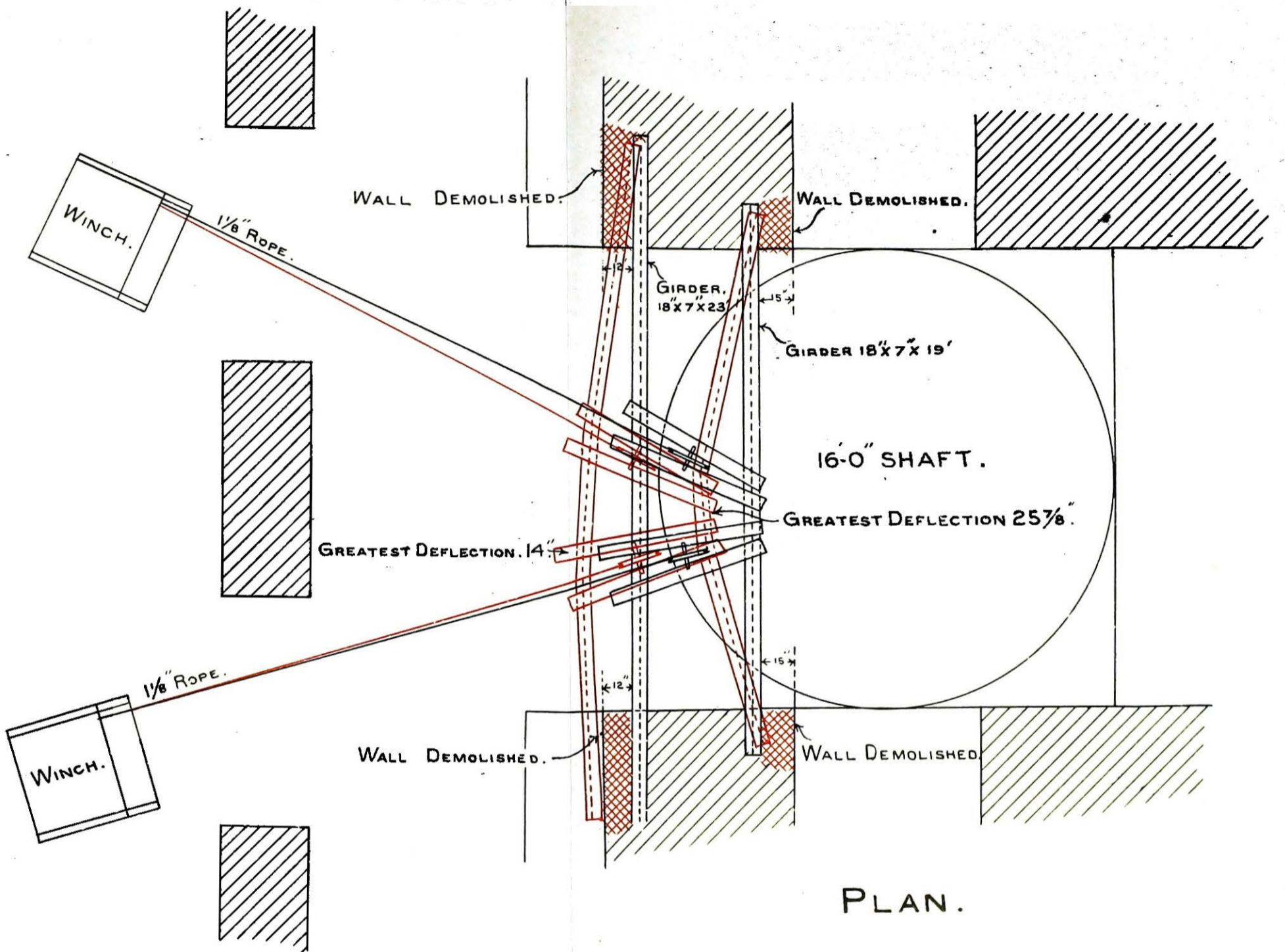
REFERENCES.

- Areas previously Goafed shown.....
- Area which collapsed and caused the accident shown.....
- Area still standing shown.....
- Where deceased was killed shown..... X

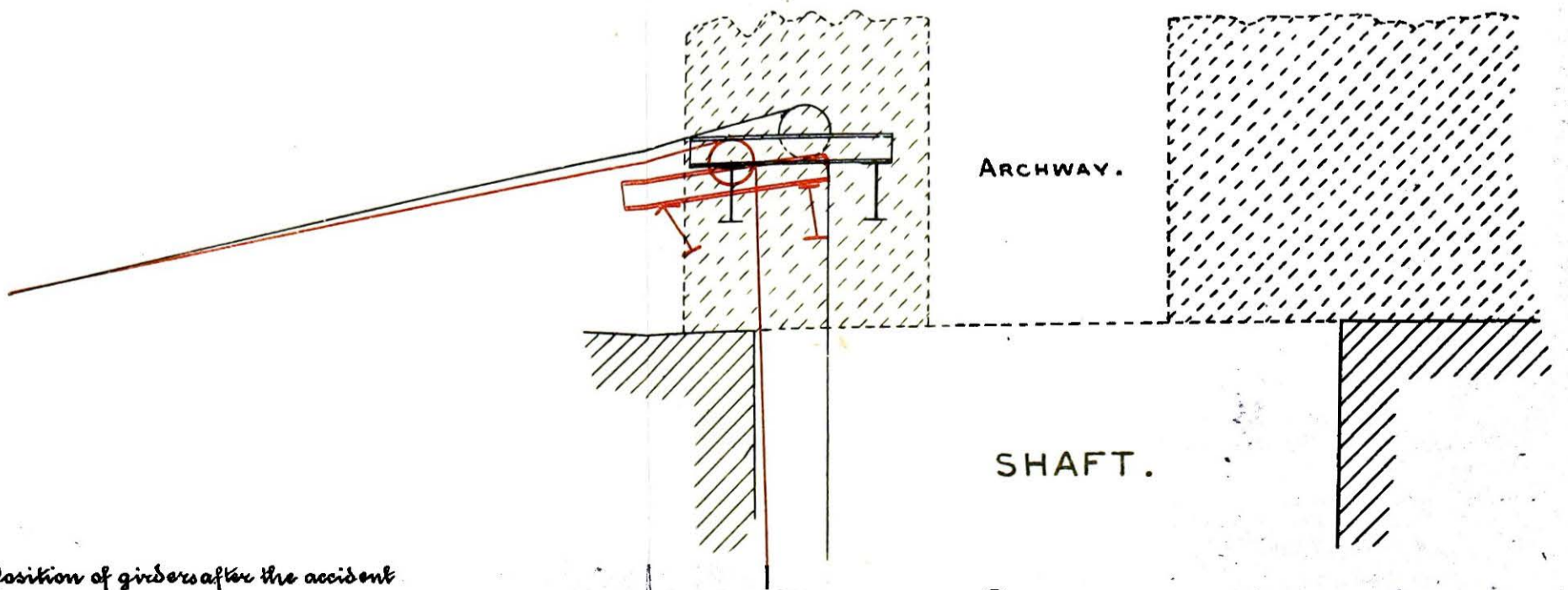
SALTORE COAL Co. LD.

No3 SHAFT.

SCALE 1 INCH = 5 FEET.



PLAN.



SHAFT.

SECTION.

Note. Position of girders after the accident shown in red

APPENDIX I.

STATISTICS OF MINES AND MINERALS.

Table No. 1.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1911.

PROVINCE.	District and mineral field.	Number of mines under the scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.		TOTAL OUTPUT.	AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.									
			Worked by mechanical power.	Not worked by mechanical power.	Number of mines inspected.	Number of inspections.		BELOW GROUND.				ABOVE GROUND.				Grand total below and above ground.	
								Adult males.	Adult females.	Children (under 12).	Total below ground.	Adult males.	Adult females.	Children (under 12).	Total above ground.		
							A.—COAL.										
							Tons.										
Bengal	Hazaribagh	Bokaro-Ramgarh	3	...	3	...	...	468	11	11	...	22	2	1	...	3	25
		Jharia	2	...	2	...	...	55	...	...	...	...	8	3	...	11	11
		Giridih	6	5	1	5	9	704,443	3,123	1,175	6	4,304	1,607	915	78	2,515	6,809
	Manbhum	Jharia	196	115	81	161	314	6,373,673	19,074	14,374	299	33,747	12,623	6,049	1,019	10,691	53,438
		Raniganj	55	10	45	48	93	451,273	2,350	936	2	3,288	926	493	22	1,441	4,729
	Bankura, Raniganj	2	...	2	1	1	7,057	33	20	...	53	6	7	...	13	66	
	Sonthal Parganas.	Raniganj	2	...	2	...	...	2,109	12	5	...	17	5	4	...	9	26
		Rajmahal	2	...	2	...	...	1,978	8	3	...	11	2	4	...	6	17
	Palamanu, Daltonganj	1	1	...	...	...	70,862	174	179	16	369	216	37	40	293	602	
	Birbhum, Raniganj	1	...	1	...	...	1,258	7	5	...	12	7	2	...	9	21	
	Burdwan, Raniganj	151	132	19	134	259	3,850,259	15,208	7,256	175	22,639	7,391	3,588	226	11,205	33,844	
	Sambalpur, Hingir-Rampur	1	1	...	1	1	5,669	116	...	...	116	119	11	...	130	245	
		TOTAL	422	264	158	350	677	11,468,904	40,115	23,984	498	64,577	22,912	11,114	1,380	35,406	99,983

APPENDIX I—contd.

STATISTICS OF MINES AND MINERALS—contd.

Table No. 1—contd.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1911.

PROVINCE.	District and mineral field.	Number of mines under the scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.		TOTAL OUTPUT. Tons.	AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.								Grand total below and above ground.
			Worked by mechanical power.	Not worked by mechanical power.	Number of mines inspected.	Number of inspections.		BELOW GROUND.				ABOVE GROUND.				
								Adult males.	Adult females.	Children (under 12).	Total below ground.	Adult males.	Adult females.	Children (under 12).	Total above ground.	
Central Provinces	Chhindwara, Pench Valley	2	2	...	2	2	63,030	195	144	7	346	86	27	11	124	470
	Narsinghpur, Mohpani	1	1	...	...	...	51,983	468	204	...	672	357	58	...	415	1,087
	Chanda, Ballarpur	1	1	...	1	2	96,603	585	...	...	585	150	...	...	150	735
	TOTAL	4	4	...	3	4	211,616	1,248	348	7	1,603	593	85	11	689	2,292
Panjab	Jhelum	8	1	7	...	...	26,982	873	...	...	873	454	...	11	465	1,338
	Shahpur	1	...	1	...	...	1,071	20	...	...	20	10	4	1	15	95
	Mianwali	1	...	1	...	...	2,522	43	...	...	43	88	1	...	89	132
	TOTAL	10	1	9	...	...	30,575	936	...	...	936	552	5	12	569	1,505
Eastern Bengal and Assam	Lakhimpur	8	6	2	7	14	291,893	944	267	...	1,211	464	250	40	754	1,965

Baluchistan	Sibi	4	1	3	1	8	43,410	527	...	...	527	279	...	31	310	837
	Loralai	1	...	1	1	1	188	8	...	...	8	3	...	...	3	11
	TOTAL	5	1	4	2	9	42,598	535	...	...	535	282	...	31	313	848
North-West Frontier Province	Hazara	1	...	1	...	...	140	5	...	...	5	...	...	...	...	5
	GRAND TOTAL (COAL) FOR 1911.	450	276	174	362	704	12,048,726	43,783	24,579	505	68,867	24,803	11,454	1,474	37,731	106,598	
	" " OF PRECEDING YEAR.	443	263	160	290	575	11,387,716	43,182	23,654	589	67,425	25,149	11,212	1,499	37,860	105,265	
	DIFFERENCE	+7	-7	+14	+72	+129	+661,010	+601	+925	-84	+1,442	-346	+242	-25	-129	+1,313	
							B.—MICA.										
							Cwts.										
Bengal	Monghyr	7	...	7	...	...	848	82	74	32	188	71	28	20	119	307
	Hazaribagh	404	13	391	75	77	18,601	3,964	1,507	226	5,637	1,643	1,595	1,174	4,412	10,109	
	Gaya	18	...	18	...	...	5,099	574	216	52	842	94	228	215	537	1,379
	TOTAL	429	13	416	75	77	24,088	4,620	1,797	310	6,727	1,803	1,851	1,409	5,068	11,795	
Madras	Nellore	51	2	49	34	34	7,046	1,295	936	84	2,815	271	419	493	1,183	3,498	
	Salem	1	...	1	...	...	77	20	...	...	20	3	...	10	18	33
	TOTAL	52	2	50	34	34	7,123	1,315	936	84	2,835	274	419	503	1,196	3,531	

APPENDIX I—contd.

STATISTICS OF MINES AND MINERALS—contd.

Table No. 1—contd.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1911.

PROVINCE.	District and mineral field.	Number of mines under the scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.		TOTAL OUTPUT.	AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.								Grand total below and above ground.	
			Worked by mechanical power.	Not worked by mechanical power.	Number of mines inspected.	Number of inspections.		BELOW GROUND.				ABOVE GROUND.					
								Adult males.	Adult females.	Children (under 12).	Total below ground.	Adult males.	Adult females.	Children (under 12).	Total above ground.		
Rajputana	Ajmer-Merwara	7	...	7	6	6	Cwts. 530	146	...	...	146	23	37	42	102	248
	GRAND TOTAL (MICA) FOR 1911.		488	15	473	115	117	31,686	6,081	2,733	394	9,208	2,105	2,307	1,954	6,366	15,574
	" " OF PRECEDING YEAR.		227	7	220	134	138	21,375	5,207	2,514	247	7,968	1,828	2,066	1,639	5,533	13,501
	DIFFERENCE . . .		+261	+8	+253	-19	-21	+10,311	+874	+219	+147	+1,240	+277	+241	+315	+833	+2,073
Central Provinces	C.—MANGANESE.																
	Nagpur	15	2	13	13	19	Tons. 148,479	1,627	1,252	11	2,890	419	258	26	703	3,593	
	Bhandara	9	...	9	2	4	77,990	375	266	...	641	456	372	10	838	1,479	
	Balaghat	6	...	6	3	9	110,794	1,201	833	59	2,093	270	95	5	370	2,463	
	Chhindwara	2	1	1	1	1	1,540	22	28	...	50	33	50	..	83	133	
TOTAL		32	3	29	19	33	338,803	3,225	2,370	70	5,674	1,178	775	41	1,994	7,668	
Madras	Vizagapatam	10	1	9	2	2	57,293	1,452	643	...	2,095	346	198	65	609	2,704	

Bombay	Panch Mahals	2	1	1	2	3	45,330	670	365	68	1,093	261	130	28	419	1,513
	GRAND TOTAL (MANGANESE) FOR 1911.	44	5	39	23	38	441,428	5,347	3,387	128	8,862	1,785	1,103	134	3,022	11,884
	" " OF PRECED- ING YEAR.	41	7	34	4	8	468,669	4,803	2,720	78	7,601	2,311	1,261	174	3,746	11,347
	DIFFERENCE	+3	-2	+5	+19	-30	-27,243	+544	+667	+50	+1,261	-526	-158	-40	-724	+537
	D.—LIMESTONE.															
	Tons.															
Central Provinces	Jabalpur, Katni	20	1	19	27	30	92,442	830	973	176	1,979	531	792	80	1,403	3,332*
Panjab	Hoshiarpur	1	...	1	...	...	250	40	...	...	40	50	...	...	50	90
	GRAND TOTAL (LIMESTONE) FOR 1911.	21	1	20	27	30	92,692	870	973	176	2,019	581	792	80	1,453	3,472
	" " OF PRECED- ING YEAR.	19	1	18	...	...	81,258	734	818	33	1,585	340	537	48	925	2,510
	DIFFERENCE	+2	...	+2	+27	+30	+11,434	+136	+155	+143	+434	+241	+255	+32	+528	+962
	E.—SALT.															
	Tons.															
Panjab	Shahpur	1	...	1	...	...	5,608	24	25	5	54	...	...	...	...	54
	Jhelum	2	...	2	...	...	108,156	371	324	49	744	83	...	...	83	777
	Mianwali	1	...	1	...	...	10,839	59	...	...	59	...	...	...	...	59
	GRAND TOTAL (SALT) FOR 1911.	4	...	4	...	...	124,603	454	349	54	857	83	...	...	83	890
	" " OF PRE- CEDING YEAR.	4	...	4	...	...	119,867	479	389	59	927	31	...	...	31	958
	DIFFERENCE . . . . .	...	...	...	...	...	+4,736	-25	-40	-5	-70	+2	...	...	+2	-68

* Includes figures for fuller's earth.

APPENDIX I—contd.

STATISTICS OF MINES AND MINERALS—contd.

Table No. 1—contd.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1911.

PROVINCE.	District and mineral field.	Number of mines under the scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.		TOTAL OUTPUT.	AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.								
			Worked by mechanical power.	Not worked by mechanical power.	Number of mines inspected.	Number of inspections.		BELOW GROUND.				ABOVE GROUND.				Grand total below and above ground.
								Adult males.	Adult females.	Children (under 12).	Total below ground.	Adult males.	Adult females.	Children (under 12).	Total above ground.	
Burma	Mogok				F.—GEMS.											
					(a) Rubies.		Carats. 222,968									
	Mogok	6	6	...	...	...	17,269	680	...	...	680	825	...	...	825	1,505
						(b) Sapphires.										
	Mogok				(c) Spinels.		47,976									
	TOTAL	6	6	...	...	...	288,213	680	...	...	680	825	...	...	825	1,505
Madras	Karnool	1	...	1	(d) Diamonds.		3	28	7	2	37	...	...	...	...	37
	GRAND TOTAL (Gems) FOR 1911.	7	6	1	...	...	288,216	708	7	2	717	825	...	...	825	1,542
	" " OF PRECEDING YEAR.	7	5	2	1	1	262,032	637	4	...	641	842	12	7	861	1,502
	DIFFERENCE	...	+1	-1	-1	-1	+26,184	+71	+3	+2	+76	-17	-12	-7	-36	+40

		G.—SLATE.														
							Tons.									
Bengal	Monghyr	6	...	6	1	1	1,014	45	23	...	68	108	17	27	152	220
Panjab	Kangra	5	...	5	7	7	4,112	108	...	...	108	199	63	61	323	431
	Gurgaon	3	...	3	1	1	2,009	46	...	29	75	89	...	6	95	170
TOTAL		8	...	8	8	8	6,131	154	...	29	183	288	63	67	418	601
GRAND TOTAL (SLATE) FOR 1911.		14	...	14	9	9	7,135	199	23	29	251	396	80	94	570	831
" " OF PRECEDING YEAR.		11	...	11	8	12	6,907	192	49	26	267	271	34	45	350	617
DIFFERENCE		+3	...	+3	+1	-3	+228	+7	-26	+3	-16	+125	+46	+49	+220	+204
H.—GOLD.																
Bombay	Dharwar	1	1	...	...	...	Ozs. 2,993	...	...	...	...	230	17	8	264	264
Madras	Anantapur	3	2	1	3	3	5,284	560	...	...	560	461	52	37	550	1,110
GRAND TOTAL (GOLD) FOR 1911.		4	3	1	3	3	8,277	560	...	...	560	700	69	45	814	1,374
" " OF PRECEDING YEAR.		4	4	..	3	3	3,269	636	...	...	636	703	147	37	887	1,523
DIFFERENCE		...	-1	+1	...	...	+5,008	-76	...	...	-76	-3	-78	+8	-73	-149
I.—IRON.																
Bengal	Singhbhum	1	...	1	...	...	Tons. 36,276	341	...	32	373	545	410	...	955	1,328
Central Provinces	Jabalpur	1	...	1	...	...	925	10	25	5	40	...	...	...	...	40
GRAND TOTAL (IRON) FOR 1911.		2	...	2	..	...	36,601	351	25	37	413	545	410	...	955	1,368
" " OF PRECEDING YEAR.		6	...	6	...	...	17,646	110	210	...	320	110	211	...	321	641
DIFFERENCE		-4	...	-4	...	...	+18,955	+241	-185	+37	+93	+435	+199	...	+634	+727

APPENDIX I—contd.

STATISTICS OF MINES AND MINERALS—contd.

Table No. 1—contd.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1911.

PROVINCE.	District and mineral field.	Number of mines under the scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.		TOTAL OUTPUT.	AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.									
			Worked by mechanical power.	Not worked by mechanical power.	Number of mines inspected.	Number of inspections.		BELOW GROUND.				ABOVE GROUND.				Grand total below and above ground.	
								Adult males.	Adult females.	Children (under 12).	Total below ground.	Adult males.	Adult females.	Children (under 12).	Total above ground.		
J.—WOLFRAMITE.																	
							Cwts.										
Burma	Mergui	1	1	..	...	...	160	...	...	...	...	...	...	...	...	...
	Tavoy	3	...	3	...	...	8,234	388	...	5	393	152	...	...	152	545
TOTAL		4	1	3	...	...	8,394	388	...	5	393	152	...	...	152	545
GRAND TOTAL (WOLFRAMITE) FOR 1911.		4	1	3	...	...	8,394	388	...	5	393	152	...	...	152	545
" " OF PRECEDING YEAR.		1	...	1	...	...	18	41	25	...	66	11	16	...	27	93
DIFFERENCE		+3	+1	+2	...	...	+8,376	+347	-25	+5	+327	+141	-16	...	+125	+452
K. MAGNESITE.																	
							Tons.										
Madras	Salem	1	...	1	...	...	3,490	150	105	33	288	24	10	5	39	327
	TOTAL OF PRECEDING YEAR		1	...	1	1	1	5,182	250	200	350	800	50	...	50	100	900
	DIFFERENCE	-1	-1	-1,692	-100	-95	-317	-512	-26	+10	-45	-61	-573

* Labour figures included with those for tin.

Baluchistan	Quetta-Fishia	4	1	3	4	5	Cwts. 5,380	8	...	...	8	1	...	...	1	9
	TOTAL OF PRECEDING YEAR	4	1	3	-	...	6,440	8	...	...	8	...	...	...	...	8
	DIFFERENCE . . . . .	...	..	...	+4	+5	-1,060	...	...	...	...	+1	...	...	+1	+1
Bengal	M.—COPPER ORE.															
	Singhbhum	1	1	...	1	4	Tons. 2,079	423	313	51	787	533	...	3	536	1,323
	TOTAL OF PRECEDING YEAR .	1	1	...	...	...	864	80	...	...	80	1,600	1,040	120	2,760	2,840
DIFFERENCE . . . . .	...	...	...	+1	+4	+1,215	+343	+313	+51	+707	-1,067	-1,040	-117	-2,224	-1,517	
Central Provinces	N.—FULLER'S EARTH.															
	Jabalpur	1	...	1	1	1	Tons. 118	...	...	...	...	...	...	...	...	...
	TOTAL OF PRECEDING YEAR .	1	...	1	...	...	84	...	...	...	...	...	...	...	...	...
DIFFERENCE . . . . .	...	...	...	+1	+1	+34	...	...	...	...	...	...	...	...	...
Central Provinces	O.—CLAY.															
	Jabalpur	3	1	2	1	1	Tons. 14,927	27	46	...	73	21	7	...	28	101
	TOTAL OF PRECEDING YEAR .	3	...	3	...	...	15,223	29	57	...	86	20	6	...	26	112
DIFFERENCE . . . . .	...	+1	-1	+1	+1	-296	-2	-11	...	-13	+1	+1	...	+2	-11	
Burma	P.—GALENA.															
	Mandalay	1	1	...	...	...	Cwts. ...	4	...	...	4	2	2	...	4	8

* Labour figures included with those for limestone.

APPENDIX I—contd.

STATISTICS OF MINES AND MINERALS—contd.

Table No. 1—contd.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1911.

PROVINCE.	District and mineral field.	Number of mines under the scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.		TOTAL OUTPUT.	AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.								Grand total below and above ground.
			Worked by mechanical power.	Not worked by mechanical power.	Number of mines inspected.	Number of inspections.		BELOW GROUND.				ABOVE GROUND.				
								Adult males.	Adult females.	Children (under 12).	Total below ground.	Adult males.	Adult females.	Children (under 12).	Total above ground.	
Madras	Kurnool	1	...	1	...	...	4	9	9	3	21	...	...	...	...	21
	GRAND TOTAL (GALENA) FOR 1911.	2	1	1	...	...	4	13	9	3	25	2	2	...	4	29
	" " OF PRECEDING YEAR.	1	...	1	...	...	460	1,270	...	...	1,270	635	716	...	1,351	2,621
	DIFFERENCE	+1	+1	...	...	...	-456	-1,257	+9	+3	-1,245	-633	-714	...	-1,347	-2,592
Bengal	Hazaribagh	1	...	1	...	...	3	6	...	...	6	7	...	...	7	13
Burma	Mergui	1	1	...	...	...	280	30	...	...	30	30	...	...	30	60*
	GRAND TOTAL (TIN) FOR 1911.	2	1	1	...	...	283	36	...	...	36	37	...	...	37	73
	" " OF PRECEDING YEAR.	2	1	1	...	...	1,103	27	...	...	27	44	...	...	44	71
	DIFFERENCE . . . . .	...	...	...	...	...	-820	+9	...	...	+9	-7	...	...	-7	+2

Central Provinces . . .	Jabalpur	2	...	2	1	1	R.—STREATITE. Cwts. 8,816		16	...	...	16	29	19	...	35	51
	Madras	Kurnool	1	...	1	1	1	3,320	15	12	11	38	...	...	...	...	38
	GRAND TOTAL (STREATITE) FOR 1911.		3	...	3	2	2	12,136	31	12	11	54	32	13	...	35	89	
	" " OF PREVIOUS YEAR.		4	...	4	1	1	3,468	36	20	..	56	31	30	3	64	120	
DIFFERENCE		-1	...	-1	+1	+1	+8,668	-5	-8	+11	-2	-9	-17	-3	-29	-31		
Madras								S.—GRAPHITE. Cwts. 1,076		10	1	..	11	2	12	...	14	25
	TOTAL of preceding year		1	...	1	...	...	5,171	11	4	...	15	5	11	...	10	31
	DIFFERENCE . . . . .		...	...	...	...	...	-4,095	-1	-3	...	-4	-3	+1	...	-2	-6
	Madras								T.—CORUNDUM. Cwts. 2,167		30	120	75	225	10	30	25	65	200
TOTAL preceding year . . . . .		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
DIFFERENCE		+1	...	+1	...	...	+2,167	+30	+120	+75	+225	+10	+30	+25	+65	+200	
Madras									U.—SAMARSKITE. Cwts. 24		2	2
	TOTAL preceding year . . . . .		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	DIFFERENCE		+1	+1	...	...	...	+24	+2	...	...	+2	...	...	...	...	+2

* Includes labour figures for wolframite,

APPENDIX I—contd.

STATISTICS OF MINES AND MINERALS—concl'd.

Table No. 1—concl'd.

Number of mines regulated by the Indian Mines Act, 1901, number of workers and output of minerals, during the year 1911.

PROVINCE.	District and mineral field.	Number of mines under the scope of the Act.	NUMBER OF MINES.		NUMBER OF MINES INSPECTED DURING THE YEAR.		TOTAL OUTPUT.	AVERAGE NUMBER OF PERSONS EMPLOYED DAILY IN AND ABOUT THE MINES.								Grand total below and above ground.
			Worked by mechanical power.	Not worked by mechanical power.	Number of mines inspected.	Number of inspections.		BELOW GROUND.				ABOVE GROUND.				
								Adult males.	Adult females.	Children (under 12).	Total below ground.	Adult males.	Adult females.	Children (under 12).	Total above ground.	
	GRAND TOTAL ((ALL MINERALS).	1,058	313	745	548	914	Tons. 12,771,797 Cwts. 61,150 Ounces. 8,277 Carats. 288,216	59,471	32,682	1,503	93,656	32,577	16,289	3,814	52,680	146,336
	GRAND TOTAL PRECEDING YEAR.	781	310	471	442	739	Tons. 12,103,439 Cwts. 87,575 Ounces. 3,269 Carats. 262,032	57,732	30,664	1,382	89,778	33,981	17,299	3,622	54,902	144,680
	DIFFERENCE	+277	+3	+274	+106	+175	Tons. +668,358 Cwts. +23,575 Ounces. +5,008 Carats. +26,184	+1,739	+2,018	+121	+3,878	-1,404	-1,010	+192	-2,222	+1,656

APPENDIX I—contd.

Table No. 2.
Number of mines opened and closed during the year ending 31st
December 1911.

Province.	District.	Number of mines opened.	Number of mines closed.
A.—COAL.			
BENGAL	Hazaribagh { Bokaro-Rangarh	3	1
	{ Giridih	1	...
	Manbhum { Jharis	14	10
	{ Raniganj	10	11
	Burdwan { Raniganj	10	14
	Sonthal Parganas { Raniganj	1	...
	{ Rajmahal . . . . .	...	1
TOTAL		39	37
PANJAB	Jhelum	2	2
EASTERN BENGAL AND ASSAM	Lakhimpur	1	...
TOTAL (COAL)		42	39
B.—MICA.			
BENGAL	Monghyr	3	1
	Hazaribagh	95	76
	Gaya . . . . .	...	4
TOTAL		98	81
MADRAS	Nellore	15	9
RAJPUTANA	Ajmer-Merwara	2	2
TOTAL (MICA)		115	92
C.—MANGANESE.			
CENTRAL PROVINCES	Bhandara	3	1
MADRAS	Vizagapatam	1	2
TOTAL (MANGANESE)		4	3
CENTRAL PROVINCES	Jabalpur	3	4
D.—LIMESTONE.			
PANJAB	Jhelum	1	...
E.—SALT.			
F.—GOLD.			
BOMBAY	Dharwar . . . . .	...	1
MADRAS	Anantapur	1	...
TOTAL (GOLD)		1	1
CENTRAL PROVINCES	Jabalpur	1	...
G.—IRON.			
BURMA	Tavoy	2	...
H.—WOLFRAMITE.			
MADRAS	Kurnool	1	...
I.—GALENA.			
BENGAL	Hazaribagh . . . . .	...	1
J.—TIN.			
CENTRAL PROVINCES	Jabalpur . . . . .	...	2
K.—STEATITE.			
MADRAS	Vizagapatam . . . . .	...	1
L.—GRAPHITE.			
MADRAS	Nellore	1	...
M.—SAMARSKITE.			
GRAND TOTAL		171	143

APPENDIX I—concl'd.

Table No. 3.

The following table shows the fluctuations in the output of the principal minerals raised from mines classed under the Indian Mines Act, 1901. The other minerals raised are gems, slate, gold, iron ore, magnesite, chromite, copper ore, tin, steatite, graphite, fuller's earth, clay, galena, wolframite, corundum and samarskite.

YEAR.	Coal.	Manganese.	Mica.	Limestone.	Salt.
	Tons.	Tons.	Cwts.	Tons.	Tons.
1902	6,790,507	144,037	21,360	30,091	87,361
1903	6,812,725	171,223	20,100	35,238	99,067
1904	7,561,338	138,733	21,320	50,847	107,413
1905	7,770,471	204,194	25,548	93,170	94,078
1906	9,112,663	436,442	50,438	48,836	118,023
1907	10,526,468	642,082	44,919	73,222	101,703
1908	12,149,020	494,942	46,208	101,569	93,779
1909	11,294,227	357,205	32,011	56,502	126,987
1910	11,387,716	468,669	21,375	81,258	119,867
1911	12,048,726	441,426	31,686	92,692	124,603

Table No. 4.

The following table shows the amount of coal raised, the average number of persons working daily and the death-rates during the years 1902 to 1911 in respect of coal mines under the Indian Mines Act, 1901.

YEAR.	Amount of coal raised.	Average number of persons working daily below and above ground.	Number of deaths below and above ground.	DEATH RATES.	
				Per 1,000,000 tons raised.	Per 1,000 persons working daily below and above ground.
1902	6,790,507	89,503	59	8.69	.66
1903	6,812,725	79,561	67	9.83	.84
1904	7,561,338	82,002	55	7.27	.67
1905	7,770,471	79,506	58	7.46	.72
1906	9,112,663	90,159	80	8.78	.89
1907	10,526,468	102,689	89	8.45	.86
1908	12,149,020	120,107	164	13.49	1.36
1909	11,294,227	109,291	119	10.53	1.08
1910	11,387,716	105,295	160	14.05	1.52
1911	12,048,726	106,598	148	12.28	1.38

Table No. 5.

Statement showing the output of coal, the number of persons employed and the number of tons of coal raised per person employed in and about the coal mines of the principal coal-producing countries of the world.

YEAR.	Country.	Tons of coal raised.	Persons employed.	Tons raised per person employed.
1910	United Kingdom	264,417,588	1,049,407	251
1909	United States	411,435,581	666,555	617
"	Germany	214,011,297	688,196	311
"	Austria	48,041,945	194,884	247
"	France	37,242,435	190,748	195
"	Belgium	23,146,111	143,051	162
"	Nova Scotia	5,217,915	12,083	432
"	British Columbia	2,400,600	6,418	374
"	Australia	8,185,593	26,938	303
"	Natal	1,786,583	9,117	195
"	Transvaal	3,235,407	8,560	377
"	Japan	14,810,441	152,515	97
"	New Zealand	1,911,247	4,191	456
1908	Russia	25,494,436	174,061	146
		1,061,337,179	3,326,724	319
1911	British India	12,048,726	106,598	113

APPENDIX II.
ACCIDENTS IN MINES.

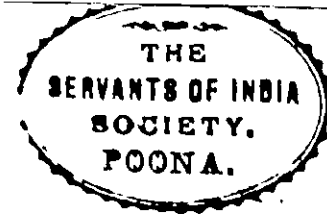


Table No. 1.

List of Fatal Accidents in mines regulated by the Indian Mines Act, 1901, during the year 1911.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age, and occupation of person killed.	Name of mineral worked.	Cause of accident and remarks.
EXPLOSIONS OF FIRE-DAMP—(17 deaths).						
1	12th April, 10 A.M.	Ramnagar Mine, Kulti P. O., Bengal.	Bengal Iron and Steel Co., Ld.	Lakhi Ghatwari, (f.), 12, Coal-carrier.	Coal .	In a mine where fire-damp had hitherto not been detected six persons entered a gallery with naked lights after it had been unworked for only four hours and ignited an accumulation of gas. All the persons sustained burns about the upper portions of their bodies and one, the deceased, a girl of 12 years of age, succumbed to her injuries 29 hours later. Inspection and inquiry made. <i>See Report, page 6.</i>
2	7th June, 5-30 P.M.	Gangutia Mine, Disbargarh P. O., Bengal.	Bengal Nagpur Coal Co., Ld.	Durga Dasadh, (m.), 26, Pump khalassi. Pirtam Dasadh, (m.), 22, Pump coolie.	Coal .	In making an attempt to retrace their steps to the surface through some abandoned workings, which they had passed through without authority earlier in the day, the two deceased, carrying naked lights, lost their way and entered a place full of gas when an explosion occurred which resulted in their deaths. Inspection and inquiry made. <i>See Report, page 8.</i>
3	9th November, 8-35 A.M.	Kendwadih Mine, Kusunda P. O., Bengal.	East Indian Coal Co., Ld.	1. Bandhu Meah, (m.), 35, Contractor. 2. Kastaria, (f.), 45, Kamin. 3. Mustoria, (f.), 35, Kamin. 4. Basharia, (f.), 15, Kamin. 5. Jaharni, (f.), 12, Kamin. 6. Jangli Meah, (m.), 30, Mason. 7. Nazimuddin Meah, (m.), 14, Coolie. 8. Sakni Fashin, (f.), 35, Kamin. 9. Foudi Shonor, (m.), 25, Trolleyman. 10. Jhagho Dasadh, (m.), 25, Hookman. 11. Budhan Barrahoi, (m.), 22, Coolie. 12. Sibcharan Barrahoi, (m.), 16, Coolie. 13. Imamom Meah, (m.), 45, Mason. 14. Bux Meah, (m.), 25, Mason.	Coal .	A fire broke out in an old goaf and, while sixteen men and five women were engaged in building brick stoppings to dam the fire off, an explosion occurred. Four men and all the women were killed outright, one man fell down the shaft when coming up and was killed, and four men succumbed to their injuries after being rescued. The remaining seven men recovered. Inspection and inquiry made. <i>See Report, page 9.</i>

APPENDIX II—contd.

Fatal Accidents, 1911—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age, and occupation of person killed.	Name of mineral worked.	Cause of accident and remarks.
FALLS OF ROOF AND SIDES—(94 deaths).						
(a) Falls of roof—(51 deaths).						
4	4th January, 1 P.M.	Kapasara Mine, Barakar P. O., Bengal.	Abdul Karim & Brothers	Fagu Mahato, (m.), 40, <i>Miner.</i>	Coal .	Deceased was warned of the danger of further undercutting some overhanging roof coal. It is presumed that he disregarded the warning and continued to undercut with the result that a piece, measuring 5' x 3½' x 1½', fell and killed him on the spot. Inspection and inquiry made.
5	8th January, 1 P.M.	Dandot Mine, Dandot P. O., Panjab.	North-Western Railway	Haitam, (m.), 28, <i>Miner.</i>	Coal .	While deceased was cutting coal in the side of a gateway, a fall of shale 9' long by 4' wide by 4" to 6" thick occurred and he was killed instantaneously.
6	11th January, 9 A.M.	Old West Ledo Valley Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Sumri Ghatwal, (f.), 30, <i>Coal-carrier.</i>	Coal .	Deceased was sitting eating food at the entrance to a "chamber," when she was struck by the fall of about one cwt. of coal from a height of four feet. She died in hospital ten days later from rupture of the spleen. Inspection and inquiry made.
7	17th January, 4 P.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Bakhsho, (m.), 40, <i>Miner.</i>	Coal .	While two miners were at work one of them felt a small stone drop from the roof on to his foot and shouted to deceased to come away. As he was crawling away a stone, 7' x 7' x 1' thick, fell from a height of two feet upon him. There were no marks of injuries. He probably died from suffocation.
8	23rd January, 1-30 P.M.	Chitidand Mine, Abbottabad P. O., Panjab.	Panjab Coal Co.	Ghulam Mahomed, (m.), 35, <i>Miner.</i>	Coal .	A short length of long wall face was declared unsafe by reason of a "slip" and was fenced, and all the miners in the neighbourhood were warned of the danger. Deceased, however, deliberately removed the fence when the official was in another part of the mine and commenced to cut coal. About an hour later a piece of shale, measuring 5' x 4' x 2' thick, knocked out a prop and fell from between the "slip" and the face upon him and killed him outright. Inspection and inquiry made.
9	8th February, 5-15 P.M.	Kendwadih Mine, Jamadoba P. O., Bengal.	Hariladih Coal Co., Ltd.	Lachman Gope, (m.), 34, <i>Timbering coolie.</i>	Coal .	Contrary to orders deceased returned to the edge of a goaf from which timber had just been withdrawn and was trapped by a pane of shale, 3' x 2½' x 4", falling on one of his feet and crushing it. He succumbed four hours later from shock. Inspection and inquiry made. <i>See Report, page 13.</i>
10	9th February, 8-30 P.M.	Kurkend Mine, Kusunda P. O., Bengal.	Central Kurkend Coal Co., Ltd.	Teku Rai, (m.), 25, <i>Coal-carrier.</i>	Coal .	On an alarm being given by a sirdar that the roof was weighting close to where two men were working, deceased, Teku, fled under the dangerous roof and was killed outright by a piece of falling coal. The other man fled towards the sirdar and escaped. Inspection and inquiry made.

11	23rd February, 5 A.M.	Tirap Mine, Margherita P. O., Assam.	Assam Railways & Trading Co., Ltd.	Parvu Bhuia, (m.), 25, <i>Coal-filler.</i>	Coal .	Deceased was buried by a fall of small coal which fell from a height of 9 feet from the side of a chamber in thick coal. He probably died of suffocation. Inspection and inquiry made.
12	1st March, 11 A.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Khudadad, (m.), 32, <i>Mine mate.</i>	Coal .	A mine carpenter had set a prop and was about to set another, when he heard the roof creak. He shouted to deceased, who was a mine mate and his superior, that the roof was bad, but deceased said it was not and told him to bring another prop. A fall occurred killing deceased. The carpenter escaped.
18	18th March, 4-30 A.M.	Sanctoria Mine, Dishargarh P. O., Bengal.	Bengal Coal Co., Ltd.	Nanda Manjhi, (m.), 30, <i>Miner.</i>	Coal .	Two small galleries intersecting a pillar had been joined during the night. The miners were then told to cut floor coal but deceased went back to the gallery and probably began to cut the side of it. A piece of roof coal, 5' long x 1' wide x 4'6" high, fell on him and killed him on the spot. Inspection and inquiry made.
14	28th March, 4 A.M.	Mohpani Mine, Mohpani P. O., Central Provinces.	Great Indian Peninsular Railway.	Passu Gond, (m.), 22, <i>Coal-cutter.</i>	Coal .	A piece of "ramble" or following stone, under which the miners hewed, instead of taking down, measuring 4' long x 3' wide x 6" to 14" thick, fell upon deceased, causing slight bruises externally. He succumbed however in five days to internal injuries.
15	1st April, 3 P.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Saudagar, (m.), 25, <i>Coolie.</i>	Coal .	Owing to recent heavy rains weakening the roof the roof-bar of a supporting set (made of old rails) had been bent by pressure. New sets were got ready but could not be placed until the bent corrugated sheets over the old roof-bars could be raised. The under-manager was supervising the cautious removal of fallen stones above the sheets and deceased was below filling the broken stones into trams when a fall of roof, 9 feet long by 7 feet wide by 10 feet high, occurred from a height of 11 feet. The roof burst through the covering sheets and killed him instantaneously.
16	1st April, 4 P.M.	Akhalpur Mine, Nandi P. O., Bengal.	Hariladih Coal Co., Ltd.	Noha Majhain, (f.), 80, <i>Dust-kamin.</i>	Coal .	Deceased had gone down with food for some of the other kamins and stayed on with them. A piece of dyke weighing about 2 cwts. fell on her. She was dead when picked up. There were no signs of injuries. She probably died from shock. Inspection and inquiry made.
17	8th April, 1 P.M.	Ramkanali Mine, Katrargarh P. O., Bengal.	Brojo Bhusan Trigunait	Asmantalla, (m.), 35, <i>Coal-cutter.</i> Tuna Sheik, (m.), 30, Kurban Sheik, (m.), 30, <i>Coal-carriers.</i>	Coal .	The deceased passed through a fence and began to rob coal from the corner of a pillar. Whilst doing so they were killed on the spot by a fall of roof stone, 10 inches thick, over an area measuring 38 feet in length by 4 to 15 feet in width. Weight about 17 tons. Inspection and inquiry made. <i>See Report, page 13.</i>
18	11th April, 4-30 P.M.	Namdang Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Budhai Kabar, (m.), 20, <i>Coal-filler.</i>	Coal .	Deceased was loading out coal from an "opening" in the middle seam, 60' x 27' x 16' high, when he was killed by the fall of about 60 lbs. of coal and dirt from the roof near the bolt-hole. Inspection and inquiry made.
19	2nd May, 8-45 A.M.	Bhutgoria Mine, Jamadoba P. O., Bengal.	Aldih Coal Co., Ltd.	Jogiram Gourah, (m.), 30, <i>Timber coolie.</i>	Coal .	Deceased was working for a sirdar and a propping carpenter who were propping round a pillar which was being removed. A stone, 6' x 2' x 1" thick, fell on him breaking over a prop which was under it. He was killed on the spot. Inspection and inquiry made.
20	6th May, 10 A.M.	Gopalichak Mine, Jharia P. O., Bengal.	Gopalichak Coal Co., Ltd.	Karu Manjhi, (m.), 40, <i>Miner.</i> Jobani Majhain, (f.), 32, <i>Carrier.</i>	Coal .	As the deceased miner was taking down some roof coal, standing on a "chair", a piece, 11' x 8' x 2' to 0', fell, overturning the chair. He and the woman carrying coal for him were killed on the spot. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1911—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age, and occupation of person killed.	Name of mineral worked.	Cause of accident and remarks.
FALLS OF ROOF AND SIDES—contd.						
(a) Falls of roof—contd.						
21	25th May, 7 A.M.	Simlabahal Mine, Jharia P. O., Bengal.	Bhalgora Coal Co., Ltd.	Chandbali Bilaspuri, (m.), 34, Coal-cutter.	Coal .	Deceased was employed in widening a narrow gallery and was caught by a fall of some two tons of coal from the roof. The coal fell from a triangular cavity, 12 feet square by 4" to 0" thick, formed by two slippery "joints." He received internal injuries and died about twelve hours later. Inspection and inquiry made.
22	1st June, 3 A.M.	Bhaga Mine, Jharia P. O., Bengal.	Jharia Colliery Co., Ltd.	Ghulam Husain, (m.), 30, Coal-cutter.	Coal .	A sirdar had fired two shots in roof coal for a gang of miners of which deceased was one. In spite of being warned he approached the place where the shots had been fired, and while he was there a fall of coal, 10' to 6' 6" x 8' x 7' thick, occurred, falling from a height of 8 feet. He was killed instantaneously. Inspection and inquiry made.
23	6th June, 5-30 P.M.	Chanch Mine, Barakar P. O., Bengal.	Bengal Coal Co., Ltd.	Doola Manjhi, (m.), 19, Miner.	Coal .	Deceased was cutting away without authority the side of a gallery that had been specially left to support a "slip," when a fall of roof, covering an area of 90 square ft. by 18 in. average thickness, occurred and killed him. The roof was much disturbed by small undisclosed slips. Inspection and inquiry made.
24	8th June, 2 P.M.	Dishargarh Mine, Dishargarh P. O., Bengal.	Equitable Coal Co., Ltd.	Somi Baurin, (f.), 30, Coal-carrier.	Coal .	While the deceased was sitting on the pit bottom road waiting to go up the shaft, about a ton of coal fell from the roof upon her. She died shortly afterwards. Inspection and inquiry made. <i>See Report, page 14.</i>
25	20th June, 2 P.M.	Lomehanchi Mine, Kodarna P. O., Bengal.	Chota Nagpur Mica Syndicate, Ltd.	Khedu Gope, (m.), 25, Miner.	Mica .	The manager had ordered work to be stopped in a mine for the monsoon season. A few days after deceased and another man went to work there. Deceased went into a small tunnel to shelter from the rain, and a fall of roof and side, 11' x 3' x 2', probably weakened by rain, fell and killed him instantaneously. Inspection and inquiry made.
26	27th June, 2 P.M.	Serampur Mine, Giridih P. O., Bengal.	East Indian Railway Co.	Samtalli Meah, (m.), 18, Mistri.	Coal .	While deceased was assisting a sirdar to set a sprag against the stone roof, a piece, 8' long x 1½' wide by 1' thick, fell from a height of 16' upon him. He died shortly after.
27	7th July, 12 Noon.	Serampur Mine, Giridih P. O., Bengal.	East Indian Railway Co.	Jugal Chamar, (m.), 23, Miner.	Coal .	During the process of clearing a bolt-hole of loose coal to set a cog, a fall of roof coal, measuring 16' x 7' x 5½', occurred killing the deceased on the spot and injuring another man. They had been warned of the danger by an official who heard the roof weighting as he approached the place, but they failed to stand clear in time. Inspection and inquiry made.
28	19th July, 2-30 P.M.	New East Ledo Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Bami Kayasta, (f.), 35, Shoveller.	Coal .	Deceased was shovelling coal down a road, 8 feet wide by 4 feet high, when about a ton of coal fell from between the props and buried her. General crush was afterwards noticed in this part of the mine and was the probable cause of the accident. She was killed instantaneously. Inspection and inquiry made.

80	3rd August, 7-30 A.M.	Barra Dhemio Mine, Sitarampur P. O., Bengal.	Barra Dhemio Coal Co., Ltd.	Badal Manjhi. (m.), 45, Miner.	Coal .	Four persons were making their way out of the mine, when a piece of shale, measuring 4' x 2½' tapering to 10" x 8" thick, fell from the roof of a gallery and struck deceased who was hurt internally so severely that he died 12 hours later. Another man was seriously injured but recovered. Inspection and inquiry made. <i>See Report, page 14.</i>
80	8th August, 7 A.M.	Jamadoba Mine, Jamadoba P. O., Bengal.	Indian Collieries Syndicate, Ltd.	Guiram Kora, (m.), 30, Coal-cutter. Fadni Koran, (f.), 25, Coal-carrier. Tribhuban Bhumij, (m.), 35 Coal-cutter.	Coal .	Deceased were extracting the last portion of a pillar in "broken" working, when a fall of roof shale, measuring 40 ft. square x 30' x 3' 6" thick, occurred. The timber was knocked out and they were knocked down and killed on the spot. One other man escaped. Inspection and inquiry made. <i>See Report, page 14.</i>
81	8th August, 1-30 P.M.	Kendwadih Mine, Jamadoba P. O., Bengal.	Hariladih Coal Co., Ltd.	Udal Bauri, (m.), 35, Coal-cutter.	Coal .	Deceased was found cutting coal in the face of a fenced off gallery and was sent out by the sirdar. Shortly after he returned and recommenced work and was killed by the fall of a slab of roof shale, weighing about half a ton and measuring 8' 3" x 2' 4" x 6". Inspection and inquiry made. <i>See Report, page 15.</i>
82	12th August, 7 P.M.	Sudamdih Mine, Bhujudih P. O., Bengal.	Sudamdih Coal Co., Ltd.	Bopan Hari, (m.), 40, Mohar Hari, (m.), 35, Coal-cutters.	Coal .	Deceased went through a fence and had no sooner begun to rob coal from a pillar, when about a ton of coal and stone fell from the roof and killed them on the spot. The gallery was 25 feet in height. Inspection and inquiry made. <i>See Report, page 15.</i>
83	14th August, 2 P.M.	Borra Mine, Sitarampur P. O., Bengal.	New Beerbhun Coal Co., Ltd.	Chand Mony Majhain, (f.), 14, Coal-carrier.	Coal .	In a coal roof full of pronounced "joints" running parallel with the sides of a gallery, a nicking 6' long had been made down the centre of the gallery which unlocked a slab of coal, measuring 6½' x 3' x 1' 9" thick, and allowed it to fall from a height of 9 feet. Deceased was loading up coal from under it at the time and was killed on the spot. Inspection and inquiry made.
84	9th September, 2-30 A.M.	Murulidih Mine, Mohoda P. O., Bengal.	Bengal Coal Co., Ltd.	Kulu Muanh, (m.), 10, Stone-cutter.	Coal .	Deceased was one of a gang of seven stone cutters who were building a pack wall. Whilst at work a stone, 7' x 2' x 2', fell from the roof. He was struck on the head and killed on the spot. Inspection and inquiry made. <i>See Report, page 15.</i>
85	12th October, 10 P.M.	Brahmanbarari Mine, Jamadoba P. O., Bengal.	East Indian Coal Co., Ltd.	Ashu Majhain, (f.), 22, Dust-loader.	Coal .	Deceased was injured by the fall of about a ton of coal from the roof of a gallery, 20 feet in height. She died on the following day. Inspection and inquiry made.
86	24th October, 1-30 A.M.	South Kustore Mine, Kustore P. O., Bengal.	Raniganj Coal Association, Ltd.	Dukhan Chamar, (m.), 35, Coal-cutter.	Coal .	Deceased was reducing a coal "knob" in a "broken" district when a fall took place in the goaf. The removal of lateral support thus caused swayed out the timber and broke down the "knob" and a portion of the roof. The fallen mass was from 5' to 10' long by 4' to 10' wide and 12' high, and would weigh about 20 tons. Whilst trying to make his escape he ran into a prop, was thrown back under the edge of the fall, and crushed to death. Inspection and inquiry made.
87	24th October, 2 P.M.	Tirap Mine, Margherita P. O., Assam.	Assam Railways and Trad- ing Co., Ltd.	Kanni Chamar, (m.), 30, Sirdar.	Coal .	Deceased was buried by the collapse of a timbered road near the entrance to a "chamber". A miner had shouted that the coal was about to fall, but deceased shouted back that there was no danger. Inspection and inquiry made. <i>See Report, page 16.</i>
88	6th November, 1-30 P.M.	West Lodo Valley Mine, Margherita P. O., Assam.	Assam Railways and Trad- ing Co., Ltd.	Bohari Ahir, (m.), 20, Basket-filler.	Coal .	Whilst deceased was filling coal in a "chamber," 12' high, a fall of about 6 cwts. of stone came away. He sustained a compound fracture of a leg and died in hospital on the following day. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1911—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral worked.	Cause of accident and remarks.
FALLS OF ROOF AND SIDES—contd.						
(a) Falls of roof—concld.						
39	9th November, 12 Noon.	West Gopalichak Mine, Kusunda P. O., Bengal.	Gopalichak Coal Co., Ltd.	Marat Dhoi, (m.), 25, Coal-cutter.	Coal .	Deceased left his proper working place and commenced to cut roof coal elsewhere, although warned by other miners to desist. A mass of 6 tons of coal, measuring 7' x 20' x 2' 6", fell from the roof 10 feet above. He was killed on the spot. A sirdar had visited the place twice during the shift, but at those times deceased was in his proper working place. Inspection and inquiry made.
40	25th November, 2-30 P.M.	Gamrala Mine, Pind Dadan Khan P. O., Panjab.	Thakur Dass Ramji Dass	Mirza Khan, (m.), 21, Hakam Khan, (m.), 40, Mohamed Khan, (m.), 15, Miners.	Coal .	On a long wall face which had recently been declared unsafe by an official and fenced, the deceased commenced to cut coal after breaking down the fence. They worked for about two hours when a slab of roof shale, measuring 10½' x 2½' x 2' thick, fell upon them killing two of them on the spot and fracturing the skull of the third, who died six hours later. The fall occurred between the front line of chocks and the face in a width of only three feet. Inspection and inquiry made.
41	10th December, 1-30 A.M.	Gopalichak Mine, Jharra P. O., Bengal.	Gopalichak Coal Co., Ltd.	Pairn Meah, (m.), 35, Bunsi Dosadh, (m.), 34, Miners.	Coal .	Deceased were working at a coal pillar in an area from which the pillars were being extracted. A fall of some 12 tons of side and roof coal took place, and knocked out the timber. They were caught and killed on the spot. Inspection and inquiry made. <i>See Report, page 16.</i>
42	15th December, 6 A.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Umra, (m.), 38, Miner.	Coal .	Two shot holes had been drilled into the roof and charged ready for blasting. A piece of roof stone, 5' long by 2' wide by 14" thick, fell from an unseon slip upon deceased. He died five days later. The drilling of the holes probably loosened the stone.
43	20th December, Midnight.	Chanich Mine, Barakar P. O., Bengal.	Bengal Coal Co., Ltd.	Panu Manjhi, (m.), 26, Coal-cutter.	Coal .	Deceased entered a fenced gallery to rob the side of a pillar, after he had struck a few blows with his pick a mass of sandstone, measuring 16' x 9' x 2' thick, fell from a height of 8½ feet upon him and killed him outright. A pick and a basket were found by the side of his body. Inspection and inquiry made.
44	22nd December, 5 A.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Abdul Mahomed, (m.), 28, Miner.	Coal .	A small sharp piece of roof stone fell upon deceased, cutting his forehead. He went home and many hours after went to hospital to be treated. The base of the skull proved to have been fractured and death followed.
45	29th December, 6 A.M.	Upper Ledo Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Ramani, (f.), 24, Coal-carrier.	Coal .	The miners were about to cease work at the end of the day, when a sudden crush occurred in an "opening" or "chamber" without warning. They ran out but deceased was caught by a fall of two tons of coal and killed. Two other persons were injured but have recovered. A sirdar was present. Inspection and inquiry made.

(b) Falls of sides—(48 deaths).

46	10th January, 9-30 A.M.	Brahmanbarari Mine, Jamadoba P. O., Bengal.	East Indian Coal Co., Ld.	Jogi Ram Dass, (m.), 36, <i>Coal-cutter.</i>	Coal	Deceased went beyond a fence and began to cut coal from the corner of a pillar. As soon as he had undercut as far as a smooth "joint," a mass of about 5 tons of coal fell away and killed him on the spot. Inspection and inquiry made.
47	11th January, 9 A.M.	Benahir Mine, Jharia P. O., Bengal.	Standard Coal Co., Ld.	Sukharia Chamarin, (f.), 35, <i>Coal-carrier.</i>	Coal	Floor coal was being cut in a gallery already 30 feet high. A miner wrongfully undermined the corner of a pillar with the result that a mass of 10 tons of coal fell from a slippery "joint." He escaped, but deceased, who was passing the place at the time, was struck and received injuries from which she died two days later. Inspection and inquiry made. <i>See Report, page 16.</i>
48	1st March, 5-30 P.M.	Burragarh Mine, Jharia P. O., Bengal.	Panjab and Bengal Coal Co., Ld.	Kunji Kurmi, (m.), 20, <i>Coal-cutter.</i>	Coal	Deceased remained behind when the rest of the workmen had finished work, and went into an unused gallery, where he began to cut overhanging coal from the side of a pillar. Whilst doing so a mass of coal, 7' x 4' x 30" to 10", weighing about 2 tons, fell upon him causing injuries from which he died two hours later. Inspection and inquiry made.
49	11th March, 2-30 P.M.	Kusunda Mine, Kusunda P. O., Bengal.	Kusunda and Nayadi Collieries, Ld.	Sohori Bhunia, (f.), 35, <i>Coal-carrier.</i>	Coal	Deceased and another woman were carrying coal in a district which was being gonfed, when about 2 cwts. of coal fell from an area of about 2' x 3' at the top of the corner of a pillar and from a height of 14 feet. They were struck by the falling coal. Deceased sustained cuts on her body and an internal strain, due to falling, from which she died nine days afterwards. Inspection and inquiry made.
50	27th March, 11-30 P.M.	Kondwadih Mine, Jamadoba P. O., Bengal.	Hariladib Coal Co., Ld.	Feringhi Toli, (m.), 45, <i>Coal-cutter.</i>	Coal	Whilst deceased and another miner were undercutting at the dip side of a pillar in a "broken" district a wedge of coal, 9' x 6' x 40" to 0", and weighing about two tons, fell away from a "joint" and struck them. He was killed on the spot and the other miner sustained a severe injury to one of his feet. Inspection and inquiry made. <i>See Report, page 17.</i>
51	4th April, 1 P.M.	Chandametta Mine, Pench Valley P. O., Central Provinces.	Pench Valley Coal Co., Ld.	Bails Garpagaran, (f.), 52, <i>Coal-filler.</i>	Coal	As deceased and a miner were raising a basket of coal, a piece of side coal, 8 feet long by 5½ feet high by 2½ feet thick, fell upon them and injured them both. Deceased died twenty-four days afterwards from the effect of the injuries received. Inspection and inquiry made.
52	4th April, 10-30 P.M.	Kantapahar Mine, Panuria P. O., Bengal.	Barakar Coal Co., Ld.	Lobin Manjhi, (m.), 25, <i>Miner.</i>	Coal	Deceased started to rob the corner of a pillar close to the end of the haulage road and consequently close to the tubs. A piece of overhanging coal, 2' x 2' x 1½', fell from a height of 7 feet and crushed his left leg. The leg was amputated, but he died after the operation from shock. Inspection and inquiry made.
53	6th April, 4-30 P.M.	Murwara Mine, Murwara P. O., Central Provinces.	J. N. Mitter	Dhanna, (m.), 15, <i>Coolie.</i>	Limestone	Deceased went into a limestone quarry to fetch some water. A fall occurred from the side of the quarry and struck him. He was thrown into the water and drowned.
54	26th April, 8-30 P.M.	Charuki Mine, Domchanch P. O., Bengal.	F. F. Chrestien & Co.	Saniehari Moshairni, (f.), 40, Pachia Moshairni, (f.), 10, Tetri Turin, (f.), 80, <i>Earth-carriers.</i> Baro Jola, (m.), 20, <i>Miner.</i>	Mica	As deceased were carrying mica to an unworked part of the mine, where it was to be sorted, the hanging wall (schist) collapsed for a length of 25 feet and a height of 24 feet, killing Pachia, Tetri, and Baro immediately. Saniehari died on the way to hospital. The schist that fell averaged about 2 feet in thickness. Inspection and inquiry made. <i>See Report, page 17.</i>

APPENDIX II—contd.

Fatal Accidents, 1911—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral worked.	Cause of accident and remarks.
FALLS OF ROOF AND SIDES—contd.						
(b) Falls of sides—contd.						
55	1st May, 1 A.M.	Baraboni Mine, Asansol P. O., Bengal.	Baraboni Coal Concern, Ltd.	Mungla Bux, (m.), 48, <i>Coal-cutter.</i>	Coal	Deceased with others was told to get a piece of coal off a side which had been left hanging after a pillar had been got in an old road, which the manager was opening out to get at some pillars. Instead of attacking it at the side he tried to put a shot hole in front and the mass, which was 7' x 4' x 2' 6" high, fell from a height of ten feet on him and killed him at once. Inspection and inquiry made.
56	4th May, 5 P.M.	Khas Jharia Mine, Jharia P. O., Bengal.	J. R. Agarwalla	Lakhu Bauri, (m.), 32, <i>Coal-cutter.</i>	Coal	Deceased had just commenced to rob coal from the side of a fenced gallery, when he was caught by a fall of side coal, measuring 33 feet in length by 11 feet in height and 4' to 0" thick, and weighing 26 tons. Inspection and inquiry made.
57	17th May, 8-30 A.M.	Bhaga Mine, Jharia P. O., Bengal.	Jharia Colliery Co., Ltd.	Thakar Das Bauri, (m.), 30, <i>Coal-cutter.</i>	Coal	Whilst robbing coal in an unused gallery deceased was killed by the fall of some 50 tons of coal from the side of a pillar. The fall was 17' long by 24' high and 4' to 2' thick. Inspection and inquiry made.
58	3rd June, 1-30 P.M.	Kantapahari Mine, Panuria P. O., Bengal.	Barakar Coal Co., Ltd.	Talu Manjhi, (m.), 35, <i>Miner.</i>	Coal	Deceased was put to work on a small pillar in a pillar cutting area about half an hour previous to the accident. Instead of beginning at the rise side of the pillar as he had been instructed to do, he went, in spite of the protestations of his wife and two other miners, who were working on the next pillar, to the bottom of the pillar to get a loose piece of overhanging coal. Almost immediately the piece, weighing about a ton, fell from a height of about 5 feet and a portion falling on him killed him instantly. Inspection and inquiry made.
59	25th June, 5-30 A.M.	Borraagarh Mine, Jharia P. O., Bengal.	Panjab and Bengal Coal Co., Ltd.	Bonomali Kora, (m.), 30, <i>Coal-cutter.</i> Saraboni Korin, (f.), 25, <i>Coal-carrier.</i>	Coal	Whilst cutting side coal, deceased were killed by the fall of a slab of coal, 3' x 6' x 1' 6", which fell on them from a height of 7½ feet. Inspection and inquiry made. <i>See Report, page 18.</i>
60	22nd July, 4 P.M.	Nodiha Mine, Ukhara P. O., Bengal.	Gosta Behari Lall Singh and others.	Bistu Bauri, (m.), 40, Ajir Shah, (m.), 16, Babulal Sheik, (m.), 30, <i>Sinkers.</i>	Coal	Four men had just gone down to work in the bottom of a pit, which was being converted into an incline, when the side wall collapsed, burying the three deceased and partially burying the fourth man. The latter was rescued but the others were killed. Inspection and inquiry made. <i>See Report, page 18.</i>
61	3rd August, 1 P.M.	Ekra Khas Mine, Bansjora P. O., Bengal.	Maharaja M. C. Nandi	Sukor Rajwar, (m.), 40, <i>Coal-cutter.</i>	Coal	Deceased went beyond a fence into an unused gallery and, whilst robbing a pillar, was killed by the fall of a ton of side coal, measuring 4' 6" x 4' 6" x 1' 3". Inspection and inquiry made. <i>See Report, page 18.</i>

62	5th August, 2-30 A.M.	Simlabahal Mine, Jharia P. O., Bengal.	Bhaigora Coal Co., Ltd.	Lineu Bilaspuri, (m.), 24, Coal-cutter.	Coal .	Deceased was cutting coal in a gallery 10½ feet high, which was being driven through a pillar, when a mass of coal, 7' high × 3'—1' wide × 20' thick, fell away from smooth "joints" in the top 7 feet in the corner of the face. He was killed on the spot. Inspection and inquiry made.
63	8th August, 10 P.M.	Bhowra Mine, Jamadoba P. O., Bengal.	Eastern Coal Co., Ltd.	Jitto Gorai, (m.), 40, Miner.	Coal .	Deceased was working in the lower section of the seam when a triangular mass of coal, 38' × 15' × 23' high, fell from the corner of a pillar in the upper section workings. The coal partition between the two workings was broken through and deceased was overwhelmed and died from suffocation, whilst efforts to rescue him were in progress. About 100 tons of coal fell. Inspection and inquiry made.
64	15th August, 7-30 A.M.	Lower Tikak Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Ramu Gasbi, (m.), 27, Hagari Koch, (m.), 40, Miners. Siki Tamli, (f.), 20, Coal-carrier, Fagu Manjhi, (m.), 35, Miner.	Coal .	Whilst deceased were at work in a "chamber," 63' long × 41' wide × 14' high, a mass of some 40 tons of coal fell away from the higher side and buried them. They were killed instantly. Inspection and inquiry made.
65	25th August, 6 P.M.	Panchgatchia Mine, Sitarampur P. O., Bengal.	Lutchipur Coal Co., Ltd.	Thanu Gope, (m.), 14, Coolie.	Coal .	Deceased was cutting away the corner of a pillar that he had previously undercut, when it came away from a "slip." In stepping back to avoid being struck he fell over a heap of coal he had stacked immediately behind him and received a few abrasions. He died from shock seven hours later. Inspection and inquiry made. See Report, page 18.
66	15th September, 4-30 P.M.	Tharghatia Mine, Ganwan P. O., Bengal.	Johur Mull and Suundur Mull.	Jibia Rajwarin, (f.), 26, Coal-carrier.	Mica .	Deceased was one of a line of men passing up earth from one to the other. A piece of the side of the quarry weighing about 10 tons, fell upon him and killed him.
67	24th September, 7 A.M.	Lodna Mine, Jharia P. O., Bengal.	Lodna Colliery Co., Ltd.	Jugal Bauri, (m.), 26, Miner. Chikonta Bauri, (m.), 13, Carrier.	Coal .	A miner was illegally robbing coal in an old gallery which was fenced off, when about a ton of coal, measuring 7' × 4' × 1', fell from the corner of a pillar and killed deceased who carried coal for him. The miner absconded. Inspection and inquiry made.
68	25th September, 11-30 P.M.	Bhuskajuri Mine, Asansol P. O., Bengal.	Bhuskajuri Coal Co., Ltd.	Agni Korin, (f.), 24, Coal-carrier.	Coal .	The elder of the two deceased was told to cut floor coal. It was evident that he had left this work and commenced to cut away a corner of a pillar a few feet away. A fall chiefly of side coal, but partly of roof coal, of about 7 cwt., fell from a height of 12 feet. They were both dead when found. Inspection and inquiry made.
69	26th September, 2-30 P.M.	Jamadoba Mine, Jamadoba P. O., Bengal.	Indian Collieries Syndicate, Ltd.	Somnath Kurmi, (m.), 40, Coal-cutter.	Coal .	Deceased was carrying coal for a miner, who was illegally robbing a pillar in an old fenced off gallery, when she was killed by the fall of about a ton of coal from the corner of a pillar. Inspection and inquiry made.
70	12th October, 2-45 P.M.	Sendra Mine, Bansjora P. O., Bengal.	Sendra Coal Co., Ltd.	Boni-Baurin, (f.), 50, Coal-carrier.	Coal .	Deceased was robbing a pillar on a travelling road, when a mass of coal, 10' long × 5' high × 2' thick, weighing about 3 tons, fell from the side upon him. He died six days later. Inspection and inquiry made. See Report, page 19.
71	17th October, 11-30 P.M.	Aldih Mine, Sitarampur P. O., Bengal.	Aldih Coal Co., Ltd.	Turi Majhain, (f.), 21, Coal-carrier.	Coal .	Deceased was loading coal which had been robbed from the side of a pillar, when a slab of coal, measuring 4' × 2' × 2', and weighing about half a ton, fell from the side. She was knocked down and received internal injuries from which she died a few hours later. Inspection and inquiry made.
72	9th November, 4 A.M.	Sitalpur Mine, Dishargarh P. O., Bengal.	Bengal Coal Co., Ltd.		Coal .	A piece of coal, measuring 20½' long × 7' high × 2" tapering to 3" thick, fell from the side of a pillar, as deceased was carrying coal past it. "Weighting" was heard by the husband, who was near at hand, and he shouted a warning to her, but she was unable to get clear in time and was knocked down. She died immediately on arrival at the surface. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1911—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age, and occupation of person killed.	Name of mineral worked.	Cause of accident and remarks.
FALLS OF ROOF AND SIDES—contd.						
(b) Falls of Sides—concl'd.						
73	18th November, 4 P.M.	Kurhbari Mine, Giridih P. O., Bengal.	East Indian Railway Co.	Kinu Meah, (m.), 18, <i>Coal-cutter.</i>	Coal	A piece of coal, measuring 20' × 6½' × 2' thick, fell from the side of a pillar, situated at the edge of a large goaf, and entrapped deceased, as he was trying to reach a place of safety. He died two and a half hours later from shock and concussion of the brain. Inspection and inquiry made.
74	24th November, 5 A.M.	Tetturia Mine, Katrasgarh P. O., Bengal.	New Tetturia Coal Co., Ld.	Nana Manjhi, (m.), 40, <i>Miner.</i>	Coal	Deceased went through a fence and began to rob coal from a pillar. A mass of coal, 11' long by 10' high by 18" thick, fell from the side and killed him on the spot. Inspection and inquiry made.
75	24th November, 8 P.M.	Bhulanbarari Mine, Jharia P. O., Bengal.	Bhulanbarari Coal Co., Ld.	Minu Chamar, (m.), 30, <i>Coal-cutter.</i>	Coal	Deceased went into an old gallery and began to rob coal from the corner of a pillar. A slab of coal, about 3' × 2' × 1" thick, fell on his head from a height of 8 feet. He sustained an injury to his neck and died some hours later. Inspection and inquiry made. <i>See Report, page 19.</i>
76	28th November, 5 P.M.	Parsatari Mine, Fatehpur P. O., Bengal.	Ram Krishna Tewari	Ancha Mushar, (m.), 20, <i>Miner.</i> Chetia Gopin, (f.), 16, <i>Coolie.</i>	Mica	A pane of decomposed pegmatite, measuring 8 feet square by 12 inches thick, became detached from the side of an open excavation 18 feet high and fell upon several persons, who were working below. The two deceased were completely buried and, before they could be extricated, were smothered. Inspection and inquiry made. <i>See Report, page 19.</i>
77	27th December, 5-30 P.M.	Dharmaband Mine, Katrasgarh P. O., Bengal.	H. A. Pringle	Charga Manjhi, (m.), 35, <i>Coal-cutter.</i>	Coal	After the other coolies had left the mine, deceased remained behind and attempted to cut coal in a place away from his working place, against orders. A stone, 3' × 3' × 2' 6" thick, suddenly fell and killed him on the spot. Inspection and inquiry made.
78	28th December, 3 A.M.	Kusunda Mine, Kusunda P. O., Bengal.	Kusunda and Nayadi Collieries, Ld.	Munbar Rai, (m.), 35, <i>Coal-cutter.</i>	Coal	Deceased was helping to get coal from a pillar. Another miner began to rob the opposite pillar and, while doing so, caused a mass of coal, 12' to 6' long by 7' high by 3' thick, to fall from a slip upon deceased, who was loading a basket with coal, killing him on the spot. Inspection and inquiry made.
IN SHAFTS—(18 deaths).						
Whilst ascending and descending by machinery—(1 death).						
79	7th May, 10 P.M.	Jamgram Mine, Panuria P. O., Bengal.	Barakar Coal Co., Ld.	Madhu Rai, (m.), 30, <i>Miner.</i>	Coal	Deceased fell out of the sinking bucket shortly after leaving the bottom, to ride up a pit 432' deep. There is not sufficient evidence to prove the cause, but it is supposed the banksman did not give the signal "men riding" to the winding engine khalassai and the latter raised the bucket sharply, giving it a jerk, which threw deceased out. Inspection and inquiry made.

Falling into the shafts from the surface—(1 death).						
80	22nd April, 12-45 P.M.	Badrachak Mine, Sijua P. O., Bengal.	Badrachak Coal Mining Co., Ltd.	Charan Koiri, (m.), 24, <i>Munshi.</i>	Coal	Deceased by some unknown means fell down a fenced shaft, 183 feet deep, and died shortly after he was brought to the surface. Inspection and inquiry made.
Falling from part of the way down—(2 deaths).						
81	9th May, 8 P.M.	Gladstone Mine, Mohulia P. O., Bengal.	Cape Copper Co., Ltd.	Mongla, (m.), 16, <i>Drill boy.</i>	Copper	Deceased was taking a message from No. 2 to No. 1 level and, slipping on a ladder, fell and fractured his skull. No one actually saw him fall. Inspection and inquiry made.
82	18th June, 9-30 A.M.	Sijua Mine, Sijua P. O., Bengal.	Sijua Coal Co., Ltd.	Jitu Manjhi, (m.), 35, <i>Coal-cutter.</i>	Coal	Deceased was supposed to have been pillar robbing in old workings and to have put out his lamp to escape detection. He crossed a substantial rail fence and fell down a staple shaft, 23 feet deep, sustaining injuries from which he died two days later. Inspection and inquiry made.
Things falling from the surface—(3 deaths).						
83	19th May, 11-30 A.M.	Katras Mine, Katrasgarh P. O., Bengal.	Nowagarh Coal Co., Ltd.	Hiru Meah, (m.), 27, <i>Pump khalassi.</i>	Coal	Deceased was standing on a pump platform and was struck on the head by a brick, which fell from the walling at the top of the shaft. The brick was dislodged by coolies, who were attempting to pull up a rope ladder hanging down the wall of the shaft. Inspection and inquiry made.
84	6th July, 12-15 A.M.	Saltore Mine, Disbargarh P. O., Bengal.	Saltore Coal Co., Ltd.	Mati Lal Roy, (m.), 29, <i>Fitter mistri.</i> Tenia Kahar, (m.), 35, <i>Pump khalassi.</i>	Coal	While the two deceased were attending to a sinking pump at a depth of 487 feet, the girders supporting the pump at the surface buckled and partially demolished the brickwork in which they were set. Some of the brick work fell down the shaft and struck the men, killing one outright and injuring the other so badly that he died two days later. Inspection and inquiry made. <i>See Report, page 20.</i>
Things falling from part of the way down—(3 deaths).						
85	9th January, 1 A.M.	Titilmuri Mine, Sijua P. O., Bengal.	Titilmuri Coal Co., Ltd.	Budhan Rai, (m.), 28, <i>Miner.</i>	Coal	Deceased was loading a bucket with coal in the shaft, when he was struck by a piece of stone, weighing about 2 lbs., which fell from the side of the shaft. He was killed instantaneously. Inspection and inquiry made.
86	13th January, 7 A.M.	Kurkend Mine, Kusunda P. O., Bengal.	Central Kurkend Coal Co., Ltd.	Sidani Malla, (m.), 22, <i>Pump khalassi.</i>	Coal	Three ranges of steam and water pipes were partially supported in a shaft by steel girders carried in hitches in the shaft walls and built in with brickwork. At the bottom of the shaft a pump was suspended. Owing to vibration set up in the pipes by the working of the pump and to the expansion of the pipes, when under steam, the brickwork became loose and a brick fell down the shaft, whilst deceased and another man were engaged in attending to the pump. He was struck on the head and killed on the spot. Inspection and inquiry made. <i>See Report, page 21.</i>
87	9th April, 8 P.M.	South Kustore Mine, Kustore P. O., Bengal.	Raniganj Coal Association, Ltd.	Amir Meah, (m.), 35, <i>Stone-cutter.</i>	Coal	While deceased was at work at the bottom of the shaft, a stone fell from somewhere in the shaft and broke his skull. He died shortly after being brought to the surface. The exact point in the shaft from which the stone fell could not be ascertained, nor could its size, as it was not identified. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1911—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age, and occupation of person killed.	Name of mineral worked.	Cause of accident and remarks.
IN SHAFTS—consolid.						
Miscellaneous—(8 deaths).						
88	30th April, 5-30 A.M.	Loyabad Mine, Bansjora P. O., Bengal.	Barakar Coal Co., Ltd.	Mohar Chamar, (m.), 30, Coal-cutter.	Coal .	Owing to a mistake by the surface hookman the cage was raised from the bottom, whilst men were lifting a derailed tub in the cage. The tub fell out upon the men and deceased was so severely injured that he died twelve days afterwards. Inspection and inquiry made.
89	18th May, 12 A.M.	Gladstone Mine, Mohulia P. O., Bengal.	Cape Copper Co., Ltd.	Satrugghan, (m.), 26, Underground coolie.	Copper .	Deceased was sented on the skip filling it. While thus engaged, the signal to hoist was given by some unauthorized person and he was crushed between the skip and the hanging wall and killed. Inspection and inquiry made.
90	29th October, 5 P.M.	Ballarpur Mine, Ballarpur P. O., Central Provinces.	Government of India	Durjun Zuri, (m.), 45, Coolie.	Coal .	Deceased was on a temporary scaffold under one of the cages at the top of a shaft, fixing a guide block, when the cage descended from a height of 8 feet and crushed him so severely that he died six days afterwards. The winding engineman stated he received instructions to lower the cages but the evidence of all on the pit top went to disprove this.
SUFFOCATION BY GASES—(2 deaths).						
91	10th December, 8 A.M.	Tikak Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Bahadur Kora, (m.), 43, Sirdar. Mohadew Bauri, (m.), 35, Brick mistri.	Coal .	Whilst engaged in plastering a fire dam, deceased were overcome by a sudden inburst of carbon dioxide, which probably came from old workings through fissures in the coal, and suffocated. Their bodies were recovered that evening. Inspection and inquiry made. See Report, page 21.
BY EXPLOSIVES—(7 deaths).						
92	5th January, 7-15 A.M.	North Anantapur Mine, Morrison P. O., Madras.	North Anantapur Mines, Ltd.	Nichiyil Naidu, (m.), 25, Valan, (m.), 30, Coolies.	Gold .	The blaster had fired seven shots. He noticed that a socket was left where one of the shot holes had been and put a stone over it, warning the workmen not to touch it. Nichiyil Naidu put a jumper into the hole in which some explosive remained. It went off, killing him instantaneously and injuring Valan so severely that he died on the following day. Inspection and inquiry made.
93	20th July, 4-40 P.M.	Pagaye Mine, Tavoy P. O., Burma.	Rangoon Mining Co., Ltd.	Iaw Se, (m.), 34, Miner.	Wolframite.	Three shot holes in an adit had been charged and the charges lit. Deceased imagined all three charges had gone off and entered the adit. He was knocked over by the third charge which went off at that moment. He died from the injuries received thirteen days afterwards.
94	26th September, 1 P.M.	North Anantapur Mine, Morrison P. O., Madras.	North Anantapur Mines, Ltd.	Guntumathi Narappa, (m.), 25, Siruval Subbrayadu, (m.), 28, Hand jumper coolies.	Gold .	Deceased were drilling a hole in a stope and drilled into either a miss-fired shot or a socket containing blasting gelatine which exploded. Guntumathi Narappa was killed outright and Siruval Subbrayadu died from shock five days later. Inquiry made.

95	19th October, 4 P.M.	Gladstone Mine, Mohulia P. O., Bengal.	Cape Copper Co., Ld.	Raggie, (m.), 22, <i>Shot-firer.</i>	Copper	Deceased fired a round of seven shots in a heading; one went off long before the others and afterwards deceased was found lying by the side of the heading 60 feet from the shots with his left hip blown in. He was semi-conscious but died in about an hour. He had been injured by the first shot. There was evidence that he afterwards crawled to where he was found. Inspection and inquiry made.
96	12th November, 4-30 P.M.	Junawani Mine, Ramtek P. O., Central Provinces.	Central India Mining Co., Ld.	Bala, (m.), 25, <i>Mining coolie.</i>	Manganese	While deceased and another miner were tamping a shot hole, it suddenly exploded injuring both of them. Deceased died from his injuries the following day.
IRRUPTIONS OF WATER OR FALLING INTO WATER—(1 death).						
97	24th May, 3 P.M.	Rocklands Mine, Podulkur P. O., Madras.	R. V. Venkata Subbiah Iyer.	Badugu Chinna Polu, (f.), 10, <i>Mica kamin.</i>	Mica	Deceased was found drowned in 12 feet of water in a quarry, which was temporarily closed, when all the other coolies had gone to a neighbouring mine to be paid. It is surmised she went to drink and fell in and was drowned. Inspection and inquiry made.
HAULAGE—(19 deaths).						
98	12th January, 10 P.M.	New Tetturia Mine, Katragarh P. O., Bengal.	New Totturia Coal Co., Ld.	Fujdar Numia, (m.), 30, <i>Tub-checker.</i>	Coal	While walking up an incline deceased was overtaken and run over by a train of tubs, which was being hauled from the workings. Inspection and inquiry made.
99	13th January, 2-15 P.M.	South Kustore Mine, Kustore P. O., Bengal.	Raniganj Coal Association, Ld.	Gangaram Gonesh Chamar, (m.), 28, <i>Coal-cutter.</i>	Coal	Deceased was killed by a train of tubs, which ran wild from the surface, owing to the carelessness of the hookman. Inspection and inquiry made.
100	17th February, 2 P.M.	East Nudkburki Mine, Nowagarh P. O., Bengal.	Auckland Coal Co., Ld.	Joti Rowani, (m.), 28, <i>Banksman.</i>	Coal	Twenty empty tubs were standing on the brow of an incline, with the leading tub spragged. Deceased took out the sprag, gave an order for the tubs to be started and then proceeded down the incline to open the dropgate. Unfortunately the three leading tubs were not coupled to the rest and they ran wild, crushing deceased against the gate. He died next day. Inspection and inquiry made. <i>See Report, page 22.</i>
101	7th March, 4 P.M.	Dhundabad Mine, Sitarampur P. O., Bengal.	New Manbhum Coal Co., Ld.	Niria Kole, (f.), 22, <i>Coal-carrier.</i>	Coal	Deceased was travelling up a road rising 1 in 13 without a light, while a loaded tub, under the control of two men, was descending. Before she could make good her escape the tub crushed her against the side of the road, where the width narrows down at a dyke from 9' to 4½'. She died almost immediately. Inspection and inquiry made.
102	5th April, 3 A.M.	Dandot Mine, Dandot P. O., Panjab.	North-Western Railway	Saif, (m.), 24, <i>Miner.</i>	Coal	As four empty tubs were about to be lowered down an incline, the last tub but one became derailed. An attempt to replace it on the rails resulted in the hook between it and the two front tubs coming out. These two tubs ran wild and caught deceased at a distance of 200 feet down the incline. He died in a few hours.
103	6th April, 4-30 P.M.	Borrea Mine, Sitarampur P. O., Bengal.	New Beerbhum Coal Co., Ld.	Mangal Manjhi, (m.), 15, <i>Coal-trammer.</i>	Coal	A loaded tub crushed out a piece of coal, that had been placed by deceased beneath one of its wheels to hold it on a grade of 1 in 12, and ran wild. He was tramping another tub in front of it and was crushed between the tubs. He died shortly afterwards. Inspection and inquiry made.
104	8th April, 6-30 P.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Ram Lal, (m.), 34, <i>Chargeman.</i>	Coal	While inspecting the winding dip by riding up on the hook and chains in front of a set of full trams, deceased appears to have lost his balance at a change of slope and fallen off, and was killed by being crushed between the trams and the side of the road.

APPENDIX II—contd.

Fatal Accidents, 1911—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age, and occupation of person killed.	Name of mineral worked.	Cause of accident and remarks.
IN SHAFTS—consolid.						
Miscellaneous—(8 deaths).						
88	30th April, 5-30 A.M.	Loyabad Mine, Bansjora P. O., Bengal.	Barakar Coal Co., Ltd.	Mohar Chamar, (m.), 30, Coal-cutter.	Coal .	Owing to a mistake by the surface hookman the cage was raised from the bottom, whilst men were lifting a derailed tub in the cage. The tub fell out upon the men and deceased was so severely injured that he died twelve days afterwards. Inspection and inquiry made.
89	18th May, 12 A.M.	Gladstone Mine, Mohulia P. O., Bengal.	Cape Copper Co., Ltd.	Satrughan, (m.), 26, Underground coolie.	Copper .	Deceased was seated on the skip filling it. While thus engaged, the signal to hoist was given by some unauthorized person and he was crushed between the skip and the hanging wall and killed. Inspection and inquiry made.
90	29th October, 5 P.M.	Ballarpur Mine, Ballarpur P. O., Central Provinces.	Government of India	Durjan Zuri, (m.), 45, Coolie.	Coal .	Deceased was on a temporary scaffold under one of the cages at the top of a shaft, fixing a guide block, when the cage descended from a height of 3 feet and crushed him so severely that he died six days afterwards. The winding engineman stated he received instructions to lower the cages but the evidence of all on the pit top went to disprove this.
SUFFOCATION BY GASES—(2 deaths).						
91	10th December, 8 A.M.	Tikak Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Bahadur Kora, (m.), 43, Sirdar. Mohadew Bauri, (m.), 35, Brick mistry.	Coal .	Whilst engaged in plastering a fire dam, deceased were overcome by a sudden inburst of carbon dioxide, which probably came from old workings through fissures in the coal, and suffocated. Their bodies were recovered that evening. Inspection and inquiry made. <i>See Report, page 21.</i>
BY EXPLOSIVES—(7 deaths).						
92	5th January, 7-15 A.M.	North Anantapur Mine, Morrison P. O., Madras.	North Anantapur Gold Mines, Ltd.	Nichiyil Naidu, (m.), 25, Valan, (m.), 30, Coolies.	Gold .	The blaster had fired seven shots. He noticed that a socket was left where one of the shot holes had been and put a stone over it, warning the workmen not to touch it. Nichiyil Naidu put a jumper into the hole in which some explosive remained. It went off, killing him instantaneously and injuring Valan so severely that he died on the following day. Inspection and inquiry made.
93	20th July, 4-40 P.M.	Pagaye Mine, Tavoy P. O., Burma.	Rangoon Mining Co., Ltd.	Law Se, (m.), 34, Miner.	Wolframite .	Three shot holes in an adit had been charged and the charges lit. Deceased imagined all three charges had gone off and entered the adit. He was knocked over by the third charge which went off at that moment. He died from the injuries received thirteen days afterwards.
94	26th September, 1 P.M.	North Anantapur Mine, Morrison P. O., Madras.	North Anantapur Gold Mines, Ltd.	Guntumathi Narappa, (m.), 25, Siruval Subbrayadu, (m.), 28, Hand jumper coolies.	Gold .	Deceased were drilling a hole in a stope and drilled into either a miss-fired shot or a socket containing blasting gelatine which exploded. Guntumathi Narappa was killed outright and Siruval Subbrayadu died from shock five days later. Inquiry made.

95	19th October, 4 P.M.	Gladstone Mine, Mohulia P. O., Bengal.	Cape Copper Co., Ld.	Raggie, (m.), 22, <i>Shot-firer.</i>	Copper	Deceased fired a round of seven shots in a heading; one went off long before the others and afterwards deceased was found lying by the side of the heading 60 feet from the shots with his left hip blown in. He was semi-conscious but died in about an hour. He had been injured by the first shot. There was evidence that he afterwards crawled to where he was found. Inspection and inquiry made.
96	12th November, 4-30 P.M.	Junawani Mine, Ramtek P. O., Central Provinces.	Central India Mining Co., Ld.	Bala, (m.), 25, <i>Mining coolie.</i>	Manganese	While deceased and another miner were tamping a shot hole, it suddenly exploded injuring both of them. Deceased died from his injuries the following day.
IRRUPTIONS OF WATER OR FALLING INTO WATER—(1 death).						
97	24th May, 3 P.M.	Rocklands Mine, Podulkur P. O., Madras.	R. V. Venkata Subbiah Iyer.	Badugu Chinna Polu, (f.), 10, <i>Mica kamin.</i>	Mica	Deceased was found drowned in 12 feet of water in a quarry, which was temporarily closed, when all the other coolies had gone to a neighbouring mine to be paid. It is surmised she went to drink and fell in and was drowned. Inspection and inquiry made.
HAULAGE—(19 deaths).						
98	12th January, 10 P.M.	New Tetturia Mine, Katrasgarh P. O., Bengal.	New Tetturia Coal Co., Ld.	Fujdar Namia, (m.), 30, <i>Tub-checker.</i>	Coal	While walking up an incline deceased was overtaken and run over by a train of tubs, which was being hauled from the workings. Inspection and inquiry made.
99	13th January, 2-15 P.M.	South Kustore Mine, Kustore P. O., Bengal.	Raniganj Coal Association, Ld.	Gangaram Gonesh Chamar, (m.), 28, <i>Coal-cutter.</i>	Coal	Deceased was killed by a train of tubs, which ran wild from the surface, owing to the carelessness of the hookman. Inspection and inquiry made.
100	17th February, 2 P.M.	East Nudkburki Mine, Nowagarh P. O., Bengal.	Auckland Coal Co., Ld.	Joti Rowani, (m.), 28, <i>Banksman.</i>	Coal	Twenty empty tubs were standing on the brow of an incline, with the leading tub spragged. Deceased took out the sprag, gave an order for the tubs to be started and then proceeded down the incline to open the droppgate. Unfortunately the three leading tubs were not coupled to the rest and they ran wild, crushing deceased against the gate. He died next day. Inspection and inquiry made. <i>See Report, page 23.</i>
101	7th March, 4 P.M.	Dhundabad Mine, Sitarampur P. O., Bengal.	New Manbhum Coal Co., Ld.	Niria Kole, (f.), 22, <i>Coal-carrier.</i>	Coal	Deceased was travelling up a road rising 1 in 13 without a light, while a loaded tub, under the control of two men, was descending. Before she could make good her escape the tub crushed her against the side of the road, where the width narrows down at a dyke from 9' to 4½'. She died almost immediately. Inspection and inquiry made.
102	5th April, 3 A.M.	Dandot Mine, Dandot P. O., Panjab.	North-Western Railway	Saif, (m.), 24, <i>Miner.</i>	Coal	As four empty tubs were about to be lowered down an incline, the last tub but one became derailed. An attempt to replace it on the rails resulted in the hook between it and the two front tubs coming out. These two tubs ran wild and caught deceased at a distance of 200 feet down the incline. He died in a few hours.
103	6th April, 4-30 P.M.	Borrea Mine, Sitarampur P. O., Bengal.	New Beerbhum Coal Co., Ld.	Mangal Manjhi, (m.), 15, <i>Coal-trammer.</i>	Coal	A loaded tub crushed out a piece of coal, that had been placed by deceased beneath one of its wheels to hold it on a grade of 1 in 12, and ran wild. He was tramping another tub in front of it and was crushed between the tubs. He died shortly afterwards. Inspection and inquiry made.
104	8th April, 6-30 P.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Ram Lal, (m.), 34, <i>Chargeman.</i>	Coal	While inspecting the winding dip by riding up on the hook and chains in front of a set of full trams, deceased appears to have lost his balance at a change of slope and fallen off, and was killed by being crushed between the trams and the side of the road.

APPENDIX II—contd.

Fatal Accidents, 1911—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age, and occupation of person killed.	Name of mineral worked.	Cause of accident and remarks.
HAULAGE—contd.						
105	15th April, 7-30 P.M.	Bhowra Mine, Jamadoba P. O., Bengal.	Eastern Coal Co., Ld.	Fagu Koiri, (m.), 40, <i>Hookman.</i>	Coal	Deceased was removing a sprag from the wheel of a tub and was caught between this tub and a train of six tubs which was slowly moving to a standstill. He sustained internal injuries from which he died eight hours later. Inspection and inquiry made.
106	28th April, 2 A.M.	Katras Mine, Katrasgarh P. O., Bengal.	Nowagarh Coal Co., Ld.	Juman Meah, (m.), 55, <i>Tub-pusher.</i>	Coal	Deceased was pushing an empty tub up a slope on the surface, when a loaded tub was allowed to run uncontrolled from the siding. A collision occurred and he was knocked down, receiving injuries from which he died fourteen hours later. Inspection and inquiry made.
107	13th May, 6-30 A.M.	Kondwadih Mine, Kusunda P. O., Bengal.	East Indian Coal Co., Ld.	Bisun Singh, (m.), 30, <i>Peon.</i>	Coal	Deceased was found dead beneath a train of derailed coal tubs, on which it is probable he had been riding, against general orders. Inspection and inquiry made.
108	3rd June, 6 P.M.	Khas Jharia Mine, Jharia P. O., Bengal.	Khas Jharia Coal Co.	Dasarath Singh, (m.), 30, <i>Underground hookman.</i>	Coal	Owing to the breakage of a rope capping, five loaded tubs ran wild on a dip haulage road. Deceased was run over and killed on the spot. Inspection and inquiry made. <i>See Report, page 22.</i>
109	20th June, 3 P.M.	Jamadoba Mine, Jamadoba P. O., Bengal.	Indian Collieries Syndi- cate, Ld.	Bishu Musahar, (m.), 27, <i>Bottom hookman.</i>	Coal	A derailment occurred on a road dipping 1 in 9 and worked by endless haulage. Whilst the derailed tub was being lifted on to the rails, the haulage was restarted, owing to the giving of an unauthorised signal by some person unknown. Another tub bumped up against the derailed tub and the impact caused its clip to open and release the tub which ran wild. Deceased was knocked down and killed by the runaway tub at a point 200 feet further down the slope. Inspection and inquiry made.
110	4th July, 10-30 P.M.	Bhowra Mine, Jamadoba P. O., Bengal.	Eastern Coal Co., Ld.	Kartik Singh, (m.), 40, <i>Hookman.</i>	Coal	Deceased was knocked down by a train of tubs which ran wild owing to the breakage of a drawbar. He died from injuries received eighteen hours later. Inspection and inquiry made.
111	21st July, 12 noon.	Kodar Mine, Chipurupalli P. O., Madras.	Vizianagram Mining Co., Ld.	Kanama, (f.), 15, <i>Coolie.</i>	Manganese	A set of six loaded tubs had been drawn up an incline and the <i>the</i> con <i>con</i> been undone. Owing to the carelessness of the incline attendant in not pulling over safety stops, a loaded tub ran down the incline and jumping the buffer stop at the bottom fell about 100 feet away. Deceased was either struck by the tub or died of shock brought on by fright. The doctor said he examined her but could find no marks. Inspection and inquiry made. <i>See Report, page 23.</i>

112	4th August, 7-30 P.M.	Raniganj Mine, Raniganj P. O., Bengal.	Bengal Coal Co., Ltd.	Umesh Bauri, (m.), 18, <i>Underground trammer.</i>	Coal .	Deceased was pushing a loaded tub, which was spragged, down an inclined plane, when he was run into from behind by another tub and had one of his legs caught between the buffers and broken. Evidence is not clear as to whether the other tub ran wild from the top of the incline or was pushed by another trammer. There was no stop-block at the top of the inclined plane. He died two days later. Inspection and inquiry made.
113	31st August, 9-20 P.M.	Lakorka Mine, Katrasgarh P. O., Bengal.	Lakorka Coal Co., Ltd.	Bhudeb Charan Mukherji, (m.), 27, <i>Pit sircar.</i>	Coal .	Whilst a train of 15 tubs was being started from the top of the haulage slope, a coupling hook fell off and four tubs ran wild. Deceased, who had just entered the arching on his way underground, was knocked down and sustained injuries from which he died within two hours. Inspection and inquiry made. <i>See Report, page 23.</i>
114	7th October, 8-30 A.M.	Chowrasi Mine, Disbargarh P. O., Bengal.	Equitable Coal Co., Ltd.	Budhu Manjhi, (m.), 25, <i>Coal-cutter.</i>	Coal .	Deceased was killed by a train of five tubs which, owing to a missed coupling, ran wild from the top of a haulage slope. The hookman responsible for the coupling together of the tubs absconded immediately. Inspection and inquiry made.
115	15th October, 2-30 A.M.	Panohatchia Mine, Sitarampur P. O., Bengal.	Lutchipur Coal Co., Ltd.	Chamari Gwala, (m.), 50, <i>Hookman.</i>	Coal .	Whilst a train of five empty tubs was being lowered on a haulage incline, the front tub became uncoupled and ran wild to the bottom, where deceased was run over and received injuries from which he died five hours later. Inspection and inquiry made. <i>See Report, page 23.</i>
116	27th October, 6-15 P.M.	Sendra Mine, Bansjora P. O., Bengal.	Sendra Coal Co., Ltd.	Amrit Chamar, (m.), 37, <i>Underground hookman.</i>	Coal .	Owing to excess of slack rope being paid out, a train of seven empty tubs ran wild for a distance of some 50 feet down a grade of 1 in 4.3. The jerk thus caused broke the rope. The released train ran into the mine. Deceased was run over and killed 200 feet further down the slope. The banksman had tied up the wire actuating the emergency stop-block and was directly responsible for the fatality. He absconded immediately. Inspection and inquiry made.
SUNDRIES UNDERGROUND—(5 deaths).						
117	23rd February, 4-0 A.M.	North Anantapur Mine, Morriston P. O., Madras.	North Anantapur Mines, Ltd.	Chemesa Pillai, (m.), 20, <i>Hand jumper coolie.</i>	Gold .	Deceased and three other men were engaged in driving a rise to connect with a winze, working on a wooden staging 15 feet from the ground. One of the timbers supporting the staging broke, it is surmised, by ground falling on top of it, and the staging was thrown to the ground and deceased died from injuries thus received. Inspection and inquiry made.
118	6th April, 1 P.M.	Mayo Mine, Khewra P. O., Panjab.	Govt. of India	Rakhi, (f.), 45, <i>Carrier.</i>	Salt .	Deceased was on her way out of the mine and had allowed her light to go out. In order to get to the travelling way she had to cross the tram line, and, as she was doing so, she was knocked down by a salt truck which was coming out. She died that night.
119	15th July, 0-20 A.M.	Dhundabad Mine, Sitarampur P. O., Bengal.	New Manbhurn Coal Co., Ltd.	Hira Manjhain, (f.), 23, <i>Coal-carrier.</i>	Coal .	An air blast produced by an extensive fall of roof dislodged a rail, 11' 6" long and weighing 52 lbs., which was supporting the shaft bottom protection sheets and hurled it a distance of 32 feet. In its flight it struck the deceased on the head and killed her outright. Inspection and inquiry made. <i>See Report, page 23.</i>
120	1st December, 8 A.M.	Kurkend Mine, Kusunda P. O., Bengal.	Central Kurkend Coal Co., Ltd.	Dassia Turin, (f.), 17, <i>Coal-carrier.</i>	Coal .	Whilst carrying a heavy basket full of coal, deceased tripped and fell on a tram line. She sustained an injury to the spine and died a few hours later. Inspection and inquiry made.
121	5th December, 7 A.M.	Ranidih Mine, Mohoda P. O., Bengal.	East Indian Mining Syndicate.	Sukri Kahar, (f.), 13, <i>Coolie.</i>	Coal .	With the object of killing vermin deceased, when underground, poured kerosene oil from a lighted lamp on her head. Her hair caught fire and she was so severely burnt that she died on the following day. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1911—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age and occupation of person killed.	Name of mineral worked.	Cause of accident and remarks.
ABOVE GROUND.						
By surface machinery—(3 deaths).						
122	20th April, 9-50 A.M.	Sanctoria Mine, Dishargarh P. O., Bengal.	Bengal Coal Co., Ltd.	Madan Khan, (m.), 62, <i>Engine cleaner.</i>	Coal .	Although warned by the engineman to desist, deceased persisted in continuing to clean the engine after it had been started. He was caught by the indicator crank and jammed in the engine, being killed instantaneously. Inspection and inquiry made.
123	8th June, 8 A.M.	Jamadoba Mine, Jamadoba P. O., Bengal.	Indian Collieries Syndicate, Ltd.	Hari Meah, (m.), 25, <i>Tub-runner.</i>	Coal .	Deceased was one of a number of men who were attempting to reverse the direction of travel of an endless haulage rope by pulling at the fly wheel of the engine. Steam was shut off at the time. After turning the fly wheel about half way round the weight of the tubs on the rope caused it to return with a jerk to its original position. Deceased was thrown into the gearing and received injuries from which he died two days later. Inspection and inquiry made.
124	21st June, 8-30 A.M.	Blugaband Mine, Jharia P. O., Bengal.	Borrea Coal Co., Ltd.	Deo Narayan Lala, (m.), 24, <i>Tub-checker.</i>	Coal .	Whilst sheltering from rain in a surface hauling engine house, deceased's clothes were caught in the gearing and he was dragged in between the spur wheel and pinion. Killed instantaneously. Inspection and inquiry made.
On surface railways and tramways belonging to the mine—(7 deaths).						
125	1st February, 8-30 P.M.	Bhuskajuri Mine, Asansol P. O., Bengal.	Bhuskajuri Coal Co., Ltd.	Jugal Bhuia, (m.), 14, <i>Tramming coolie.</i>	Coal .	A loaded tub was being emptied by deceased on a trestle tramway, 9 feet high, when another tub collided with it, with the result that deceased was pitched on to the ground below and, alighting on his head, sustained compression of the brain. He died seven days later. Inspection and inquiry made.
126	9th February, 1 P.M.	Craddock Mine, Pench Valley P. O., Central Provinces.	Central Pench Valley Coal Co., Ltd.	Rangu Gond, (m.), 45, <i>Coolie.</i>	Coal .	Deceased was riding, without orders, on a tub frame, down a slight gradient, and collided with a tub loaded with rails and sleepers, his head striking the end of a rail on the loaded tub. He was killed instantly.
127	16th March, 7 P.M.	Kochkurie Mine, Ramtek P. O., Central Provinces.	Bansil Ambirchand Mining Syndicate.	Govind Ram, (m.), 45, <i>Cashier.</i>	Manganese .	Deceased was trolleying at dusk on the tram line and the trolley he was on ran into or was run into by four empty ore tubs coming the other way. He had one of his legs cut off and died about two hours afterwards from shock. Inspection and inquiry made. <i>See Report, page 24.</i>
128	31st July, 7-30 A.M.	Tikak Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Bodri Gwala, (m.), 40, <i>Sweeper.</i>	Coal .	Whilst travelling down the incline on the surface, deceased, who was partly blind, deaf, and of unsound mind, was run over and killed by a train of coal tubs. Inspection and inquiry made.

129	3rd September, 10 A.M.	Kodur Mine, Chipurupalli P. O., Madras.	Vizianagram Mining Co., Ld.	Lenka Bungari, (m.), 50, <i>Coolie.</i>	Manganese	The coupling between the second and last tubs of a set of three unhooked and the front two tubs went on ahead. Deceased had one foot on the second tub and one on the last one and when they parted he fell between them and was run over. One of his ankles was badly crushed. The foot was amputated the next day, but he died after the operation. Inspection and inquiry made.
130	8th November, 2-30 A.M.	Bagdigi Mine, Jharia P. O., Bengal.	C. J. Smith	Jhari Mahato, (m.), 22, <i>Surface-trammer.</i>	Coal	Deceased was sleeping about 3 feet away from a tram line on the surface, at night, when a loaded tub derailed and fell upon him killing him on the spot. Inspection and inquiry made.
131	21st November, 9-15 A.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Mahomed Aswar, (m.), 18, <i>Fireman.</i>	Coal	As deceased was walking a few feet in front of a colliery locomotive sprinkling dust on the lines because they were slippery, he slipped and fell, and the locomotive passed over him. He died in a few minutes.
Miscellaneous on surface—(6 deaths.)						
132	14th January, 9 P.M.	Khuldiha Mine, Giridih P. O., Bengal.	Bengal Coal Co., Ld.	Gondo Gope, (m.), 40, <i>Winding engine khalassi.</i>	Coal	Deceased's body was found in a boiler feed water tank. His clothes were on the edge and it is presumed that he fell in while washing himself. The tank was fenced by a single wire. Inspection and inquiry made.
133	15th January, 6 A.M.	Bhuggudih Mine, Dhanbaid P. O., Bengal.	Bengal-Nagpur Coal Co., Ld.	Bisna Burhi, (m.), 20, <i>Depôt coolie.</i>	Coal	Deceased was found dead floating in a boiler feed water tank, 12' 0" x 8' 6", which had 7 feet of water in it. He had probably climbed over the fence surrounding it on the previous (Sunday) evening to bathe. Inspection and inquiry made.
134	17th January, 3 P.M.	Hiria Mine, Kodarma P. O., Bengal.	S. K. and K. K. Sahana .	Bhatu Meah, (m.), 18, <i>Splitter.</i>	Mica	Deceased and three other men had made a hole in a mica waste heap about 5 feet deep. The side collapsed and buried them. The three others were rescued alive, but deceased died from suffocation.
135	1st May, 9 P.M.	Kurkend Mine, Kusunda P. O., Bengal.	Central Kurkend Coal Co., Ld.	Obad Bawrin, (f.), 40, <i>Coal-carrier.</i>	Coal	Deceased was filling her lighted lamp with kerosine oil from a bottle, when the bottle caught fire. The fire spread to her clothes and she was badly burnt, dying two days afterwards. Inspection and inquiry made.
136	6th July, 8-30 A.M.	South Kujama Mine, Jharia P. O., Bengal.	Bagdiggi-Kujama Col- lieries Co., Ld.	Punit Bhua, (m.), 55, <i>Surface labourer.</i>	Coal	Deceased was struck on the neck by a falling ladder, and expired six hours later. Inspection and inquiry made.
137	1st December, 4-30 P.M.	Kabulgitti Mine, Kabulgitti P. O., Bombay.	Kabulgitti Gold Mines	Beldhadi Sankia, (m.), 30, <i>Coolie.</i>	Gold	As the timber boomstay beam of a head gear was being lowered, a snatch block broke, and the beam swung round and fell, knocking down deceased who was running away at the time. He died seventeen hours afterwards.

APPENDIX II—contd.

Fatal Accidents, 1911—contd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age, and occupation of person killed.	Name of mineral worked.	Reason for exclusion.	Cause of accident and remarks.
DEATHS NOT INCLUDED IN THE STATISTICS—(23 deaths).							
1	6th January, 3-45 P.M.	Pathargada Mine, Bhujudih P. O., Bengal	Kohinoor Coal Co., Ltd.	Ramgutti Kurmin, (f.), 4.	Coal	Not employed	Deceased was alone in a hut, which caught fire, and was burned to death. Inspection and inquiry made.
2	19th January, 9 A.M.	Vanora Khas Mine, Charanpur P. O., Bengal.	Maharaja M. C. Nandi	Paloon Koiri, (m.), 3.	Coal	Not employed	While loaded tubs were being shunted on a surface tram line, situated within 20 feet of some dwellings, the deceased strayed upon the line and was run over. Inspection and inquiry made.
3	28th January, 4 P.M.	Jotejanaki Mine, Chowkidanga P. O., Bengal.	Banerji Santan	Nanda Bauri, (m.), 55, <i>Colliery contractor's thatcher.</i>	Coal	Not employed at mine.	Deceased, with another man, was crossing a bridge over which trams run, from the pit. They had been engaged in thatching some coolies' huts and were returning from work. While on the bridge, thinking they heard a tram coming, they ran, and deceased tripped and fell over the end of the bridge into the jore below and broke one of his legs just above the ankle. He died a month later. Inspection and inquiry made.
4	3rd February, 1-55 A.M.	Tumsar Road Tramway, Bhandara P. O., Central Provinces.	Central India Mining Co., Ltd.	Haria Chamar, (m.), 22, <i>Tub cleaner.</i>	Manganese	Not a mine tramway.	Deceased was sleeping near a coal fire on a surface railway. His clothes caught fire and he was burnt so severely that he died three days later.
5	1st March, 10 A.M.	Shivrajpur Mine, Shivrajpur P. O., Bombay.	Shivrajpur Syndicate, Ltd.	Sunder Rama, (f.), 1½.	Manganese	Not employed	The deceased child crawled away unnoticed from the place where she was put down by her mother and which was about 25 yards off and went to sleep with her right arm and leg over the rail. A full tub pushed by the father and uncle of deceased ran over her and she had her arm and leg cut off dying from shock ten days after. Inspection and inquiry made.
6	18th March, 6 A.M.	Kenda ² Mine, Chowkidanga P. O., Bengal.	Fulchand Marwari	Mukhu Majhain, (f.), 17, <i>Underground loading kamin.</i>	Coal	Suicide	Deceased had been off work for 3 or 4 days complaining of feeling ill in her head. She went out of her house when her husband went to the bazar and threw herself into a pit. She was seen and pulled out, but died. Inspection and inquiry made.
7	19th March, Unknown.	Jamuria Mine, Nandi P. O., Bengal.	Equitable Coal Co., Ltd.	Fagu Manjhi, (m.), 48.	Coal	Not employed	Deceased was found drowned in a boiler feed water tank, 40 feet square and 12 feet high. There was 6 feet of water in the tank, which was properly fenced. It is presumed he fell in in a fit. Inspection and inquiry made.
8	19th March, 10 A.M.	Borrea Mine, Sitarampur P. O., Bengal.	New Beerbhun Coal Co., Ltd.	Okhoy Gope, (m.), 4½.	Coal	Not employed	According to the evidence of his nephew, deceased had been mad for about a year. He ran out of the house and, when running past an abandoned pit, 35 feet deep, which was unfenced, he fell into it. Whether by accident or design is unknown. He was dead when got out. Inspection and inquiry made. <i>See Report, page 24.</i>

9	27th March, 5 A.M.	Salanpur Mine, Sitarampur P. O., Bengal.	Borrea Coal Co., Ltd.	Piari Marwarin, (f.), 30.	Coal	Not employed	Deceased, while suffering great pain, deliberately climbed the protection wall of an old shaft and jumped into about 60 feet of water. Her body was recovered three days later. Inspection and inquiry made.
10	16th April, 7-30 P.M.	Kendwadih Mine, Kusunda P. O., Bengal.	East Indian Coal Co., Ltd.	Bhogia Dosadhin, (f.), 30.	Coal	Not a mine accident.	Deceased died from burns received while endeavouring to rescue property from a burning hut. Inspection and inquiry made.
11	—May,	Jairamdanga Mine, Asansol P. O., Bengal.	New Beerbhum Coal Co., Ltd.	Unknown, (f.), 45.	Coal	Not employed.	Deceased was found at the bottom of No. 6 pit, which is disused. She had quarrelled with her son and it was presumed afterwards committed suicide by throwing herself down the shaft. The shaft was well fenced. Inspection and inquiry made.
12	5th June, 8 A.M.	Kujama Mine, Jharia P. O., Bengal.	L. H. Dass & Co.	Dadia Nuth, (m.), 33, <i>Pump khalassi.</i>	Coal	Not a mine accident.	Deceased was lowered in a basket by a rope to the bottom of an old well, 71 feet deep, for the purpose of examining it. After remaining a few moments he was hauled up again, but fell from the rope when he had been drawn about half way up. He was rescued, but died shortly afterwards from injuries due to the fall. Two days later a lamp was extinguished when lowered to a depth of 26 feet. From this it is evident that deceased was overcome by breathing air containing an excess of carbonic acid gas. Inspection and inquiry made.
13	22nd June, 8 P.M.	Kujama Mine, Jharia P. O., Bengal.	G. K. Dosa & Co.	Bhagbania Bhunia, (f.), 4.	Coal	Not employed	Deceased was blind and partly deaf, and, falling into a small stream near the coolie lines, she was drowned. Inspection and inquiry made.
14	4th July, 6 A.M.	Egarcoor Mine, Chirkunda P. O., Bengal.	Umed Bhai Patel	Radha Merchi, (m.), 1	Coal	Not employed	Following the extraction of pillars under a thin cover, about 1,600 square feet of surface, upon which a hut was standing, subsided to a depth of 7 feet and reduced the hut to ruins. Seven persons were extricated from the ruins, one of whom, a child, aged 1 year, was dead. Two others were injured. Inspection and inquiry made. <i>See Report, page 24.</i>
15	6th July, Unknown.	Katras Mine, Katrasgarh P. O., Bengal.	Nowagarh Coal Co., Ltd.	Guyaram Dhobi, (m.), 36.	Coal	Dhobie	Whilst in a state of intoxication, he fell into an old shaft fenced by a wall only 30 inches high. Inspection and inquiry made.
16	19th August, 8 P.M.	Bagdiggi Mine, Jharia P. O., Bengal.	C. J. Smith	Rogunath Kahar, (m.), 26, <i>Domestic servant.</i>	Coal	Not employed on the mine. Suicide.	Deceased had committed a theft and, whilst attempting to evade pursuit, jumped into an old quarry and was drowned. Inspection and inquiry made.
17	21st August, 12 Noon.	Kusunda Mine, Kusunda P. O., Bengal.	Kusunda and Nayadi Collieries, Ltd.	Bidhu Muchin, (f.), 20.	Coal	Not employed	Deceased was found drowned in a boiler feed water tank which was properly fenced. Inspection and inquiry made.
18	5th September, 12-30 P.M.	Sanctoria Mine, Dishargarh P. O., Bengal.	Bengal Coal Co., Ltd.	Mungri Dosadhin, (f.); 37.	Coal	Not employed	In the absence of any eye-witnesses deceased fell into a boiler feed water tank containing water 11' 6" deep. It was evident that she had climbed through the protection fence to fetch drinking water. Inspection and inquiry made.
19	6th October, 9 A.M.	Rajhara Mine, Rajhara P. O., Bengal.	Bengal Coal Co., Ltd.	Harakmonia Koirin Mahata, (f.), 70.	Coal	Not employed	Deceased was walking along a surface tram line and was run over by the first of six empty tubs which were being pushed by a locomotive towards the pits. She died on the way to the hospital.

APPENDIX II—concl'd.

Fatal Accidents, 1911—concl'd.

Serial number.	Date and hour of accident.	Name and situation of mine.	Name of owner.	Name, sex, age, and occupation of person killed.	Name of mineral worked.	Reason for exclusion.	Cause of accident and remarks.
DEATHS NOT INCLUDED IN THE STATISTICS—concl'd.							
20	21st October, 11 A.M.	Alkusa Mine, Kustore P. O., Bengal.	Raniganj Coal Association, Ld.	Pattiya Dosani, (f.), 38, Coal-loader.	Coal	Not a mine accident.	Whilst wagons were being hand shunted, deceased attempted to cross the line and was crushed between two wagons, sustaining internal injuries from which she died five hours later. Inspection and inquiry made.
21	28th October, 12-30 P.M.	Benahir Mine, Jharia P. O., Bengal.	Standard Coal Co., Ld.	Gajwa Dosadh, (m.), 5	Coal	Not employed	Deceased was run over by a loaded tub which was allowed to run uncontrolled down a slope. He received injuries from which he died on the following day. Inspection and inquiry made.
22	5th December, 9-15 P.M.	West Gopalichak Mine, Kusunda P. O., Pengal.	Gopalichak Coal Co., Ld.	Bundia Musalmani, (f.), 13, Surface labourer.	Coal	Not a mine accident.	Deceased was drawing water from a well and by some unknown means fell in and was drowned. Inspection and inquiry made.
23	10th December, 12 Noon.	Jamuria Mine, Nandi P. O., Bengal.	Equitable Coal Co., Ld.	Machoea-Singh, (m.), 33, Labourer.	Coal	Not a mine accident.	Deceased with three other men was lifting a double headed-rail 18 ft. long, down from a height of 7'-6", when he slipped and the rail fell and, in falling, hit him on the head, fracturing his skull. He died three days afterwards. Inspection and inquiry made.

APPENDIX II—contd.

Table No. 2.

Statement of fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901, during the year 1911.

PROVINCE.	District and mineral field.	Total average number of persons employed daily.	FATAL ACCIDENTS.			SERIOUS ACCIDENTS.			DEATH RATE PER 1,000 PERSONS EMPLOYED.					
			Number of separate fatal accidents.	NUMBER OF DEATHS.		Number of serious non-fatal accidents.	NUMBER OF PERSONS SERIOUSLY INJURED.		Below ground.	Above ground.	Below and above ground.			
				Below ground.	Above ground.		Total deaths.	Below ground.				Above ground.	Total number of persons injured.	
A.—COAL.														
Bengal	Hazaribagh {	Bokaro-Ramgarh	25	...	...	...	...	...	...	...	...	...	...
		Giridih	6,899	4	3	1	4	5	4	1	5	69	38	57
		Jharia	11	...	...	...	...	...	...	...	...	...	...	...
		Manbhum, Jharia	53,438	60	75	6	81	31	20	11	31	2.22	30	1.51
		" Rániganj	4,729	5	6	...	6	5	3	2	5	1.82	...	1.26
		Bankura "	66	...	...	...	...	...	...	...	...	...	...	...
		Birbhum "	21	...	...	...	...	...	...	...	...	...	...	...
		Burdwan "	83,844	23	25	2	27	33	29	6	35	1.10	17	.79
		Sonthal Parganas, Raniganj	26	...	...	...	...	...	...	...	...	...	...	...
		" Rajmahal	17	...	...	...	...	...	...	...	...	...	...	...
	Palamanu, Daltonganj	662	...	...	...	...	...	...	...	...	...	...	...
	Sambalpur, Hingir-Rampur	245	...	...	...	...	...	...	...	...	...	...	...
	TOTAL	99,983	92	109	9	118	74	56	20	76	1.68	.25	1.18	
Central Provinces	{	Ohhindwara, Pench Valley	470	2	1	1	2	...	...	...	...	2.89	8.06	4.25
		Narsinghpur, Mohpani	1,087	1	1	...	1	2	2	...	2	1.48	...	.92
		Chanda, Ballarpur	735	1	1	...	1	1	1	...	1	1.70	...	1.36
		TOTAL	2,292	4	3	1	4	3	3	...	3	1.87	1.45	1.74
Panjab	{	Jhelum	1,353	4	6	...	6	3	3	...	3	6.87	...	4.48
		Shahpur	35	...	...	...	...	...	...	...	...	...	...	...
		Mianwali	132	...	...	...	...	...	...	...	...	...	...	...
		TOTAL	1,505	4	6	...	6	3	3	...	3	6.41	...	3.98
Eastern Bengal and Assam	Lakhimpur	1,965	10	12	1	13	5	5	...	5	9.90	1.32	6.61	
Baluchistan	{	Sibi, Khoet	837	7	6	1	7	3	2	1	3	11.38	3.22	3.36
		Loralai, Loralai	11	...	...	...	...	...	...	...	...	...	...	...
		TOTAL	848	7	6	1	7	3	2	1	3	11.21	3.19	3.25
North-West Province.	Frontier	Hazara	5	...	...	...	...	...	...	...	...	...	...
GRAND TOTAL (COAL)		106,598	117	136	12	148	88	69	21	90	1.97	.31	1.36	

APPENDIX II—contd.

Table No. 2—contd.

Statement of fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901, during the year 1911.

PROVINCE.	District and mineral field.	Total average number of persons employed daily.	FATAL ACCIDENTS.			SERIOUS ACCIDENTS.			DEATH RATE PER 1,000 PERSONS EMPLOYED.				
			Number of separate fatal accidents.	NUMBER OF DEATHS.		Number of serious non-fatal accidents.	NUMBER OF PERSONS SERIOUSLY INJURED.		Below ground.	Above ground.	Below and above ground.		
				Below ground.	Above ground.		Total deaths.	Below ground.				Above ground.	Total number of persons injured.
Bengal	Mongiyar	307	...	...	...	...	...	...	...	...	...	...
	Hazaribagh	10,109	5	8	1	9	2	8	...	8	1.40	.22	.89
	Gaya	1,379	...	...	...	...	...	...	...	...	...	...	...
	TOTAL	11,795	5	8	1	9	2	8	...	8	1.18	.19	.76
Madras	Nellore	3,498	1	1	...	1	...	...	...	...	.43	...	.23
	Salem	33	...	...	...	...	...	...	...	...	...	...	...
	TOTAL	3,531	1	1	...	1	...	...	...	...	.42	...	.23
Rajputana	Ajmer-Merwara	248	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (MICA)	15,574	6	9	1	10	2	8	...	8	.97	.15	.64
Central Provinces	C.—MANGANESE.												
	Nagpur	3,593	2	1	1	2	1	...	1	1	.34	1.42	.55
	Bhandara	1,479	...	...	...	...	8	...	8	8	...	...	...
	Balaghat	2,463	...	...	...	...	2	1	1	2	...	...	...
	Chhindwara	133	...	...	...	...	...	...	...	...	...	...	...
TOTAL	7,668	2	1	1	2	11	1	10	11	.17	.50	.26	
Madras	Vizagapatam	2,704	2	1	1	2	...	...	...	...	.47	1.64	.73
Bombay	Panch Mahals	1,512	...	...	...	...	1	1	...	1	...	...	...
	GRAND TOTAL (MANGANESE)	11,884	4	2	2	4	12	2	10	12	.22	.66	.33
Central Provinces	D.—LIMESTONE.												
	Jabalpur-Katni	3,382	1	1	...	1	...	...	...	...	.50	...	.20
	Hoshiarpur	90	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (LIMESTONE)	3,472	1	1	...	1	...	...	...	...	.49	...	.28
Panjab	E.—SALT.												
	Shahpur	54	...	...	...	...	...	...	...	...	...	...	...
	Jhelum	777	1	1	...	1	13	13	...	13	1.34	...	1.28
Mianwali	59	...	...	...	...	2	...	2	2	...	...	...

APPENDIX II—contd.

Table No. 2—contd.

Statement of fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901, during the year 1911.

PROVINCE.	District and mineral field.	Total average number of persons employed daily.	FATAL ACCIDENTS.			SERIOUS ACCIDENTS.			DEATH RATE PER 1,000 PERSONS EMPLOYED.				
			Number of separate fatal accidents.	NUMBER OF DEATHS.		Number of serious non-fatal accidents.	NUMBER OF PERSONS SERIOUSLY INJURED.		Below ground.	Above ground.	Below and above ground.		
				Below ground.	Above ground.		Total deaths.	Below ground.				Above ground.	Total number of persons injured.
F.—GEMS.													
Bihar	Mogok (Rubies, etc.)	1,505	...	...	...	...	2	...	2	2	...	...	...
Madras	Kurnool (Diamonds)	37	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (GEMS)	1,542	...	...	...	...	2	...	2	2	...	...	...
G.—SLATE.													
Bengal	Monghyr	220	...	...	...	...	...	...	...	...	...	...	...
Punjab	Kangra	431	...	...	...	...	...	...	...	...	...	...	...
	Gurgaon	170	...	...	...	...	...	...	...	...	...	...	...
	TOTAL	601	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (SLATE)	821	...	...	...	...	...	...	...	...	...	...	...
H.—GOLD.													
Bombay	Dharwar	264	1	...	1	1	...	...	...	...	...	3.78	3.78
Madras	Anantapur	1,110	3	5	...	5	2	3	...	3	8.93	...	4.50
	GRAND TOTAL (GOLD)	1,374	4	5	1	6	2	3	...	3	8.93	1.22	4.36
I.—IRON.													
Central Provinces	Jabalpur	40	...	...	...	...	...	...	...	...	...	...	...
Bengal	Singhbhum	1,328	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (IRON)	1,368	...	...	...	...	...	...	...	...	...	...	...
J.—WOLFRAMITE.													
Assam	Tavoy	545	1	1	...	1	...	...	...	...	2.54	...	1.83
	Mergui	...	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (WOLFRAMITE)	545	1	1	...	1	...	...	...	...	2.54	...	1.83
K.—MAGNESITE.													
Madras	Salem	327	...	...	...	...	...	...	...	...	...	...	...
L.—CHROMITE.													
British India	Quetta-Fishin	9	...	...	...	...	1	1	...	1	...	...	...

APPENDIX II—contd.

Table No. 2—contd.

Statement of fatal and serious accidents in and about mines regulated by the Indian Mines Act, 1901, during the year 1911.

PROVINCE.	District and mineral field.	Total average number of persons employed daily.	FATAL ACCIDENTS.			SERIOUS ACCIDENTS.			DEATH RATE PER 1,000 PERSONS EMPLOYED.				
			Number of separate fatal accidents.	NUMBER OF DEATHS.		Number of serious non-fatal accidents.	NUMBER OF PERSONS SERIOUSLY INJURED.		Below ground.	Above ground.	Below and above ground.		
				Below ground.	Above ground.		Total deaths.	Below ground.				Above ground.	Total number of persons injured.
			M.—COPPER ORE.										
Bengal	Singhbhum	1,323	3	3	...	3	1	4	...	4	381	...	2.96
			N.—FULLER'S EARTH.										
Central Provinces	Jabalpur . . . . .	...	...	...	...	...	...	...	...	...	...	...	...
			O.—CLAY.										
Central Provinces	Jabalpur	101	...	...	...	...	...	...	...	...	...	...	...
			P—GALENA.										
Burma	Mandalay	8	...	...	...	...	...	...	...	...	...	...	...
Madras	Kurnool	21	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (GALENA) .	29	...	...	...	...	...	...	...	...	...	...	...
			Q.—TIN.										
Bengal	Hazaribagh	13	...	...	...	...	...	...	...	...	...	...	...
Burma	Mergui (Maliwan)	60	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (TIN) .	73	...	...	...	...	...	...	...	...	...	...	...
			R.—STEATITE.										
Central Provinces	Jabalpur	51	...	...	...	...	...	...	...	...	...	...	...
Madras	Kurnool	38	...	...	...	...	1	...	1	1	...	...	...
	GRAND TOTAL (STEATITE)	89	...	...	...	...	1	...	1	1	...	...	...
			S.—GRAPHITE.										
Madras	Vizagapatam	25	...	...	...	...	...	...	...	...	...	...	...
			T.—CORUNDUM.										
Madras	Trichinopoly	290	...	...	...	...	...	...	...	...	...	...	...
			U.—SAMARSKITE.										
Madras	Nellore	2	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (ALL MINERALS).	146,336	137	158	16	174	124	100	36	136	1.68	.30	1.18

APPENDIX II—c



Table No. 3.

Statement of fatal accidents in mines regulated by the Indian Mines Act, 1901, during the year 1911, classified according to the age and sex of the workers.

MINERAL.	PROVINCE AND MINERAL FIELD.	Number of separate fatal accidents.	NUMBER OF DEATHS.								TOTAL BELOW AND ABOVE GROUPS.	
			BELOW GROUPS.				ABOVE GROUPS.					
			Adult males.	Adult females.	Children (under 13).	TOTAL.	Adult males.	Adult females.	Children (under 13).	TOTAL.		
COAL	Baluchistan	7	6	—	—	6	1	—	—	1	7	
	Bengal	Giridih	4	3	—	—	3	1	—	—	1	4
		Jharis	60	60	16	—	75	5	1	—	6	81
		Raniganj	28	23	8	—	31	2	—	—	2	33
	TOTAL (BENGAL)	92	86	28	—	109	8	1	—	9	118	
	Central Provinces	4	2	1	—	3	1	—	—	1	4	
	Eastern Bengal and Assam	10	8	4	—	12	1	—	—	1	13	
Panjab	4	6	—	—	6	—	—	—	—	6		
TOTAL COAL	117	108	28	—	136	11	1	—	12	148		
MICA	Bengal	5	4	3	1	8	1	—	—	1	9	
	Madras	1	—	—	1	1	—	—	—	—	1	
	TOTAL MICA	6	4	3	2	9	1	—	—	1	10	
MANGANESE	Central Provinces	2	1	—	—	1	1	—	—	1	2	
	Madras	2	—	1	—	1	—	1	—	1	2	
	TOTAL MANGANESE	4	1	1	—	2	1	1	—	2	4	
LIMESTONE	Central Provinces	1	1	—	—	1	—	—	—	—	1	
SALT	Panjab	1	—	1	—	1	—	—	—	—	1	
GOLD	Bombay	1	—	—	—	—	1	—	—	—	1	
	Madras	3	5	—	—	5	—	—	—	—	5	
	TOTAL GOLD	4	5	—	—	5	1	—	—	1	6	
WOLFRAMITE	Burma	1	1	—	—	1	—	—	—	—	1	
COPPER	Bengal	3	3	—	—	3	—	—	—	—	3	
GRAND TOTAL, ALL MINERALS		137	123	33	2	158	14	2	—	16	174	

APPENDIX II—concl'd.

Table No. 4.

Statement of fatal accidents in mines regulated by the Indian Mines Act, 1901, during the year 1911, classified according to cause of accident.

MINERAL WORKED.	Number of separate fatal accidents.	NUMBER OF PERSONS KILLED.										DEATH RATE PER 1,000 PERSONS EMPLOYED.			
		Explosions of fire-dump.	Falls of roof.	Falls of side.	In shafts.	By explosives.	Suffocation by gases.	Irritations of water or falling into water.	Haulage.	Miscellaneous below ground.	Surface.	Total deaths.	Below ground.	Above ground.	Below and above ground.
Coal	117	17	50	35	11	...	2	...	18	3	12	148	1.97	.31	1.38
Mica	6	...	1	7	...	...	...	1	...	...	1	10	.97	.15	.64
Manganese	4	...	...	...	...	1	...	...	1	...	2	4	.22	.66	.33
Limestone	1	...	...	1	...	...	...	...	...	...	...	1	.49	...	.28
Salt	1	...	...	...	...	...	...	...	...	1	...	1	1.16	...	1.12
Gold	4	...	...	...	...	4	...	...	...	1	1	6	8.93	1.22	4.36
Wolframite	1	...	...	...	...	1	...	...	...	...	...	1	2.54	...	1.88
Copper	3	...	...	...	2	1	...	...	...	...	...	3	3.81	...	2.26
Total 1911	137	17	51	43	13	7	2	1	19	5	16	174	1.68	.30	1.18
Total preceding year.	117	27	52	32	20	8	...	6	16	9	16	186	1.89	.29	1.29
Difference	+20	-10	-1	+11	-7	-1	+2	-5	+3	-4	...	-12	-21	+1	-11

APPENDIX III.

PROSECUTIONS UNDER THE MINES ACT.

Statement of prosecutions instituted under the Indian Mines Act, 1901,
during the year 1911.

PROVINCE.	District.	Number of prosecutions.	Number of persons prosecuted.	Number convicted.	Numbers of rules and sections of the Act, contravened.	REMARKS.
Bengal	Manbhum	1	1	1	Section 20, Rules 3 and 7.	
	Do.	1	1	1	Ditto.	
	Do.	1	1	1	Section 20, Rule 7.	
	Do.	1	1	1	Ditto.	
	Burdwan	1	1	1	Section 20, Rule 19.	
	Manbhum	1	1	1	Section 20, Rules 4 (b), 9, 22, and 23 and section 13 (1).	
	Do.	1	1	1	Section 20, Rules 7, 8 and 9.	
	Do.	1	1	1	Ditto.	
	Do.	1	1	withdrawn	Section 20, Rules 8, 19 and 20.	
	Do.	1	1	1	Ditto.	
Central Provinces	Do.	1	1	1	Ditto.	
	Mohpani	1	1	1	Section 20, Rule 17 (b).	Prosecution of workman by manager.

APPENDIX IV.

MISCELLANEOUS.

Statement No. 1.

List of Inspection Circles.

No. 1 Circle.	No. 2 Circle.	No. 3 Circle.
(a) All mines in the district of Manbhum, which are situated west of a line drawn from Adra Junction at mile 175 of the Bengal Nagpur Railway to Gobindpur at mile 169 on the Grand Trunk Road and continued across the district in each direction, and all mines in the district of Palamau.	(a) All mines in the districts of Burdwan and Bankura to the west of a line drawn from mile 131 on the East Indian Railway main line near Asansol to mile 141 on the Ondal loop near Gaurangdi, and continued across the districts in each direction; and all mines in the district of Manbhum east of a line drawn from Adra Junction at mile 175 on the Bengal-Nagpur Railway to Gobindpur at mile 169 on the Grand Trunk Road, and continued across the districts in each direction, and all mines in the districts of Hazaribagh, Gaya, Monghyr, Darjeeling and Ranchi.	(a) All mines in the districts of Burdwan and Bankura to the east of a line drawn from mile 131 on the East Indian Railway main line near Asansol to mile 141 on the Ondal loop near Gaurangdi, and continued across the districts in each direction, and all mines in the districts of the Sonthal Parganas, Birbhum, Singhbhum and Sambalpur.
(b) All mines in Assam.	(b) All mines in Baluchistan.	(b) All mines in the Presidency of Bombay.
(c) All mines in Burma.	(c) All mines in the United Provinces.	(c) All mines in the Central Provinces.
	(d) All mines in the Panjab.	(d) All mines in the Presidency of Madras.
	(e) All mines in Ajmer-Merwara.	

APPENDIX IV—*contd.*

MISCELLANEOUS.

Statement No. 2.

List of holders of certificates as managers of coal mines in British India.

(a) Certificates granted to holders of English certificates of competency.

FIRST CLASS.

NAME.	No. of Indian certificate.	Date of Indian certificate.	No. of English certificate.	Date of English certificate.
Turnbull, John	155	25th March 1911 .	3511	30th December 1909.
Hines, Gordon Ewart	156	15th December 1911 .	3496	30th October 1909.
Lang, George Lawrence	157	Ditto.	3503	30th December 1909.
Fidoe, John Walter	158	Ditto.	3659	29th June 1910.
Entwistle, George	159	Ditto.	3078	8th January 1908.
Bridgett, Harry	160	Ditto.	2369	13th May 1904.
Wight, Llewelyn	161	Ditto.	3472	4th October 1909.
Loveband, Charles James Glenfield	162	Ditto.	2011	26th May 1902.

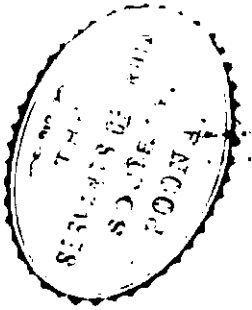
(b) Certificates of competency.

FIRST CLASS.

NAME.	No. of certificate.	Date of certificate.	REMARKS.
Mitchell, Lionel Patrick	57	25th March 1911.	
Cox, Henry Moncrieff	58	Ditto.	
Dutt, Aswini Kumar	59	Ditto.	

SECOND CLASS.

Chatterji, Hirendro Nath	58	25th March 1911.	
Bhattacharji, Manmatha Nath	59	Ditto.	
Mukherji, Mohini Mohan	60	Ditto.	
Banerji, Govindra Chandra	61	Ditto.	
Guisse, Archibald Henry Charles	62	Ditto.	
Power, Clarence Eustus	63	Ditto.	

APPENDIX IV—*contd.*

MISCELLANEOUS.

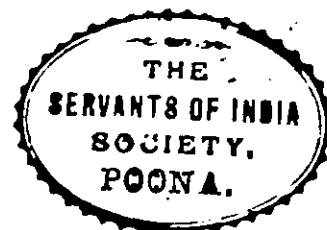
Statement No. 3.

List of Universities and Colleges in England and India approved by the Governor-General in Council for the purposes of Rules 32 and 33 under the Indian Mines Act, 1901.

Name of Institution and Degree or Diploma.	Date.
University of Birmingham in respect of its Degree of B.Sc. in Mining and Diploma in Mining.	11th June 1904.
University College of Bristol in respect of its Senior Diploma in Mining.	16th September 1904.
University of Cambridge in respect of its Diploma in Mining Engineering.	6th June 1905.
University of Durham in respect of its Degree of B.Sc. in Mining	21st December 1903.
Durham College of Science in respect of its Diploma in Mining	29th June 1904.
University of Glasgow in respect of its Degree and Diploma in Mining.	28th September 1904.
Glasgow and West of Scotland Technical College in respect of its Diploma in Mining.	28th June 1904.
University of Leeds in respect of its Degree of B. Sc. in Mining and Diploma in Mining.	21st November 1904.
University of London in respect of its B.Sc. Degree in Mining for Internal Students, subject to the Degree being endorsed by the University with a certificate of four months' practical experience in a mine.	9th June 1905.
University of London in respect of its B.Sc. Degree in Mining for External Students, subject to the Degree being endorsed by the University with a certificate of four months' practical experience in a Mine.	7th August 1906.
Royal School of Mines in respect of its Associateship in Mining	24th March 1904.
University of Oxford in respect of its Diploma B. for Colliery Engineers (in Scientific Engineering and Mining subjects).	11th February 1905.
University College of Sheffield in respect of its Diploma in Mining.	15th July 1904.
University College of South Wales and Monmouthshire in respect of its Diploma in Mining.	19th April 1904.
Wigan Mining and Technical College in respect of its Diploma in Mining.	26th August 1904.
Civil Engineering College, Sibpur, in respect of its Diploma in Mining.	22nd February 1907.
Merchant Venturers' Technical College, Bristol, in respect of its Diploma in Mining Engineering.	5th October 1905.
Victoria University of Manchester in respect of its Degree and Certificate of Mining.	14th February 1906.
University College of Nottingham in respect of its Diploma in Mining Engineering.	28th March 1906.
University of Sheffield in respect of its Degree of Bachelor of Engineering. (Mining).	30th June 1906.
Heriot-Watt College in respect of its certificate in Mining Engineering.	16th January 1908.
Calcutta University in respect of its Degree of Bachelor of Engineering in the branch of Mining Engineering.	24th September 1910.

APPENDIX IV—*contd.*

MISCELLANEOUS.



Statement No. 4.

SIBPUR COLLEGE.

THE MINING CLASSES.

CIRCULAR.

These classes :
General explanation
 in the principles of
 coal or metal mines,
 qualify them to a
 Mines Act, VIII of

The course at
 end of the second
 in mining at Sibpur

the attached syllabus and the diploma examination takes place

The classes are open to both regular students and special

Regular students—Are those who have qualified for admission into the sub-overseer examination of the Civil Engineering College, or an equivalent test of other colleges.

Their age limits are 17 years minimum and 19 years maximum on admission.

Special students.—Persons resident in Bengal, who have been employed upon mines, will be admitted as special students under the following conditions:—

- (a) that they have completed at least two years' practical work upon a mine; and
- (b) that they have passed (i) the B. Final Examination, (ii) the Matriculation or Entrance Examination of any Indian University, or (iii) any test equivalent to the Middle School Examination of the Code for European Schools.

There is no limit of age for such special students.

All applications for admission from outside candidates should be posted so as to reach the Principal's office by 1st April.

Regular students should apply in the proper form available from the Principal's office.

Special students must provide, (a) proof of educational attainments, and (b) a statement showing the nature and extent of their employment upon mines and the period thereof, supported by certificates from the mine managers under whom they have worked.

SCHOLARSHIPS AWARDED BY THE GOVERNMENT OF BENGAL.

For regular students.—Two scholarships of Rs. 12 monthly and three of Rs. 6 are provided. These will be awarded on the results of the sub-overseer examination by the Director of Public Instruction on the recommendation of the Principal. Students trained at the Civil Engineering College or any affiliated technical school in Bengal are eligible for these scholarships. If they are on the Reduced fee list, they will be charged full tuition fees.

For special students.—Two scholarships of Rs. 150 monthly for European candidates and two of Rs. 50 monthly for Indian candidates, each tenable for two years, are offered. These will be awarded annually by the Director of Public Instruction on the recommendation of the Mining Advisory Board.

These scholarships are available for candidates who have had at least two years' actual experience of colliery work. They must have passed the Calcutta University Entrance Examination or an equivalent. For Europeans the Middle School Examination of the Code for European Schools or equivalent is accepted.

There is no limit of age.

Application for these scholarships should be made to the Principal of the Civil Engineering College, when applying for admission.

There is no residential accommodation available at the college for special students, scholarship-holders or otherwise: they must make their own arrangement for board and lodging, and must attend the college daily from 8 A. M. A mid-day meal will be supplied if desired at the college at a definite monthly charge to be fixed by the Principal.

SCHOLARSHIPS AWARDED BY THE GOVERNMENT OF EASTERN BENGAL AND ASSAM.

For regular students.—Three of the value of Rs. 15, one being reserved for each of the following classes, namely, European, Muhammadan and Hindu, confined to students domiciled in Eastern Bengal and Assam.

APPENDIX IV—*contd.*

MISCELLANEOUS.

Statement No. 4—*contd.*

For special students qualified as above.—One of Rs. 30 for an European. Two of Rs. 20—one for a Muhammadan and one for a Hindu. The rates for special students are fixed on the understanding that they will reside at the college hostel. If accommodation is not available, Government are prepared to consider an increase. Applications for these scholarships to be made to the Director of Public Instruction of Eastern Bengal and Assam.

The session begins each year on or about the first Monday in May. The college closes for the long vacation about the first week of August and re-opens about the end of October. Special students must pass all college test examinations and must appear at the diploma examination held at the end of the course.

The following fees will be charged from special students:—

Caution money deposit.—Rs. 5, which will be returned on leaving the college after deducting any charge-dues owing.

Tuition fee.—Rs. 3 monthly payable for 12 months in the year.

Mid-day meal.—Rs. 10 monthly for Europeans, and Rs. 5 for Indians.

All fees become due on the 15th of the month.

Regular students, who must be residents, will be charged in full the fees noted in the Rules of the Apprentice Department.

A camp of practical mining and surveying will be held for six weeks in the cold weather of each session in the colliery districts.

SYLLABUS OF MINING COURSES.

COURSE I.

Geology applied to mining.—(One lecture per week.)

Classification of rocks: characteristic fossils and economic products of the principal systems.

Structure of rock; foldings, faults, cleavage, formation of mineral veins.

Principles of geological surveying: methods employed in constructing geological maps and sections. Special reference to the geology of India.

Mining Engineering.—(Two lectures per week.)

Boring by hand and power machines.

Sinking and lining shafts; various methods employed in special cases.

Systems of haulage, underground and aboveground, aerial ropeways.

Hoisting, headgear, ropes, safety appliances.

Mining legislation.

Section A.—(One lecture per week.)

Methods of working coal, shafts, pillars, preliminary work, and various methods of working the seams. Special reference to thick coal working as practised in England and different parts of the world.

Shot-firing; coal-cutting by machinery.

Surface subsidence and under-sea working.

Timbering and other supports.

Coal mine plans and sections, connecting surface and underground surveys.

Section B.—(One lecture per week.)

Prospecting for and methods of working mineral veins.

Alluvial mining and open workings.

Hydraulic mining; dredging for gold; ore-beds and deep leads, overhand and underhand stopping.

Hand and power drilling; blasting, timbering.

Metal mine plans.

COURSE II.

Descriptive Mineralogy.—(One lecture per week.)

Physical properties of minerals; description of various ores and fuels; methods of determination.

Prospecting operations.

Mining Engineering.—(Two lectures per week during first-half of session.)

Drainage of mines; adits, levels; pumping machinery; dams; boring against old workings.

Ventilation of mines; natural and artificial ventilation; splitting and regulating air-currents; types of fans; water-gauge and anemometer.

Power-application in a mine; discussion of relative merits of steam, water, compressed air, electricity and oil, as sources of applied power.

Section A.—(One lecture per week.)

Description of gases found in coal mines; colliery explosions; safety lamps; instruments for detecting fire-damp; treatment of men overcome by foul air.

APPENDIX IV—*contd.*

MISCELLANEOUS.

Statement No. 4—*concl'd.*

Arrangement of surface works at a colliery; sorting and screening coals; coal-washing, briquette making, coking and bye-products.

Section B.—(One lecture per week).

Surface works of metal mines, sorting, crushing, sizing, and concentration of various ores. Modern ore-dressing machinery, and slime tables.

Special reference to treatment of gold, silver, copper, lead and zinc.

Cyanide and Chlorine treatment of slimes.

Statement No. 5.

The Mining Educational Advisory Board desire that colliery managers will kindly publish this information in their collieries, and use their influence to maintain a regular attendance of the students.

MINING INSTRUCTION IN BENGAL.

RANIGANJ AND JHARIA COAL-FIELDS.

Lectures will be delivered throughout the session at the following centres:—

1. Lecture room near Sijua station on Tuesdays at 6-30 P.M.
Lecturer—Mr. B. Starks Field.
2. Lecture room near the Jharia Club on Mondays at 5-30 P.M.
Lecturer—Mr. J. Wilson, B.Sc.
3. Lecture room at Messrs. Apcar and Company's Charanpur Colliery on Fridays at 5-30 P.M.
Lecturer—Mr. H. C. Read, B.Sc., (BIRM.)
4. Lecture room near Dishargarh Club on Wednesdays at 5-30 P.M.
Lecturer—Mr. L. A. Jacobs, B.Sc., (DUN.)

The course of instruction, consisting of not less than 25 lectures, will commence the first week in November and end in the following May. At the end of the course an examination will be held, and candidates who pass the examination will receive a certificate recording their success. No candidate will, however, be permitted to sit for examination, unless he has attended 50 per cent. of the lectures.

All Europeans and English-speaking Indians are cordially invited to attend.

Particulars of the Sibpur College Mining Classes and of the scholarship connected therewith may be obtained from the Principal of the College. Instruction is given in Methods of Mining, General Engineering, Mechanics, Surveying, Science, Mineralogy and Workshop practice. On completion of the course (4 years for beginners and 2 years for those having previous mining experience and requisite educational qualifications), a diploma is granted to successful students. The Mining Educational Advisory Board has the duty of annually selecting candidates for four scholarships tenable at the college (2 of Rs. 50 for Indians and 2 of Rs. 150 for Europeans). The Board gives preference to suitable candidates who have previously attended lectures at the mining centres under the Board's control.

The following Sub-Committees have been appointed for each centre.

RANIGANJ DISTRICT.

Dishargarh Centre.

Mr. G. C. Leach (Chairman).
 „ Glen George.
 „ J. Mackintosh.
 „ Geo. Miller.
 „ F. Owen.
 Babu M. N. Roy (Begunia).
 „ H. P. Mukherji (Chota Dhemo).
 „ D. C. Tarafdar.
 The Local Lecturer (Secretary).

Charanpur Centre.

Mr. C. J. E. David (Chairman).
 „ S. Heslop.
 „ R. Mitchell.
 „ E. M. Patterson.
 „ A. Russell.
 Babu Rajoni Prokash Chuckerbutti.
 The Local Lecturer (Secretary).

APPENDIX IV—*contd.*

MISCELLANEOUS.

Statement No. 5—*contd.*

JHARIA DISTRICT.

<i>Jharia Centre.</i>	<i>Sijua Centre.</i>
The Chief Inspector of Mines (Chairman).	Mr. R. R. Simpson (Chairman).
Mr. T. Adamson.	„ A. Agabeg.
„ R. G. M. Bathgate.	„ E. S. Bennertz.
„ R. J. Browne.	„ W. Hutton-Williams.
„ A. S. Thomson.	Babu Sourindra Nath Dutta.
Babu Bhupati Mukherji.	„ Surendra Nath Sarkar.
„ Sita Nath Dutta.	The Local Lecturer (Secretary).
The Local Lecturer (Secretary).	

SYLLABUS OF THE COURSE OF INSTRUCTION.

THE course will treat principally of the more practical operations in actual mining, with special reference to India, and the principles underlying such operations will be thoroughly discussed. Special attention will be paid to the various methods of working thick seams. Sketches illustrating the lectures will be distributed free of charge.

At the close of each lecture, questions will be set for home work.

FIRST YEAR COURSE 1910-11 AND 1912-13.

1. *Geology*.—General structure of the crust of the earth: descriptions of fault, dyke-outcrop, dip, strike, unconformity, etc.; composition and properties of coal; special reference to the coal measures in India: Importance of recording results of observations.

2. *Exploration*.—Advantages of borings; driving through faults, washouts, dykes, methods of maintaining the direction and gradient of such drivages.

3. *Boring and winning*.—Different systems of boring; choice of methods; cost of boring; winning coal by inclines, adits, shafts and crosscuts.

4. *Sinking*.—Site of colliery; position of shafts, excavation and shape; blasting with use of safety fuse and electric battery; explosives and detonators, their safe storing and handling; sinking and how to deal with difficulties: apparatus and tools used; lining shafts and scaffolding; pit-banking arrangements.

5. *Opening out and methods of working, surveying*.—Shafts, pillars; arching or supporting the pit bottom; quarrying; pillar and stall; double road stall; long wall; panel systems.

6. *Timbering and supporting*.—Fixing of props and double timber; chocks or cogs; special methods of timbering to withstand pressure from the roof, sides and floor; securing dangerous holes in the roof due to heavy falls; use of iron or steel girders; stowing and packing; arching.

7. *Gases met with in coal-mines*.—Their experimental preparation by chemicals and illustration of their physical and physiological properties; methods of detecting; explosion and gob fires.

8. *Ventilation*.—Natural and artificial methods; coursing the air; use of stoppings, brattices, doors, air-bridges, regulators; measuring the quantity of air, use of thermometer, barometer, water-gauge, anemometer; the friction of air in mines and the elementary theory of splitting.

9. *Safety lamps*.—Theory of the safety lamp, Sir Humphrey Davy's experiment; the Davy lamp, the Clanny and Thomas and Williams lamps, the Marsaut and Mueseler lamps; fire-lamp detectors.

SECOND YEAR COURSE 1911-12.

1. *Mechanical engineering of collieries*.—Winding engines, discussion of the different types, calculation of the dimensions of cylinders, length of stroke, diameter of drum, etc.; strength of winding ropes and chains, detaching hooks, capping winding ropes, care and examination of ropes.

2. *Pumping*.—Importance of a good system; measurement of quantities of water; lifting and forcing pumps; pumps for sinking; temporary and permanent pumps; calculation of dimensions of pumps to perform a given duty, strength of pipes, methods of supporting; different types of joints.

3. *Hauling*.—Tramways; tubs and waggons; conveyance by self-acting inclines; single-rope haulage; main and tail; endless rope; endless chain; calculations concerning inclines, sizes of haulage engines, ropes, etc.; signalling; capping of haulage ropes.

4. *Methods of working and ventilation*.—Revision of First year Course work, followed by a fuller treatment of these subjects.

APPENDIX IV—*contd.*

MISCELLANEOUS.

Statement No. 5—*concl'd.*

5. *Surface arrangements.*—Boilers; Cornish, Lancashire, and water-tube types; boiler fittings, injectors, and steam-pipes, etc.; boiler explosions, incrustation, corrosion, and priming; calculations on boilers. Heapsteads; arrangement of roads around pit bank; simple screening and sizing.

6. *Transmission of power* by steam, compressed air, and electricity; discussing the relative merits of each system.

7. *Text-books recommended.*—Peel's or Kerr's Elementary Mining; O'Donoghue's Mining Arithmetic.

A. DU PRÉ DENNING,

Supdt. of Industries, etc.,

Secretary to the Mining Educational Advisory Board,

Writers' Buildings, Calcutta.

Statement No. 6.

No. 6436—152.

GOVERNMENT OF INDIA.

DEPARTMENT OF COMMERCE AND INDUSTRY.

NOTIFICATION.

GEOLOGY AND MINERALS.

Simla, the 2nd September 1911.

In exercise of the powers conferred by Section 20 of the Indian Mines Act, 1901 (VIII of 1901), the Governor-General in Council is pleased to make the following rules, for the whole of British India, in respect of mica, manganese, and limestone mines, other than mines which have been exempted from the operation of the Act under Section 29 thereof.

PART I.

MANAGEMENT.

1. When a change occurs in the name or address of the manager of a mine, notice of change of name and address of the change shall be sent within one month, by the owner, agent or manager, to the Chief Inspector of Mines in India and also to the Magistrate of the district.

2. For every mine a book, to be called the Inspection Book, shall be kept, in which Inspecting Officers shall record their observations. The owner, agent or manager shall also write or cause to be written at the commencement of the book—

- (a) the name of the mine,
- (b) the name and address of the owner of the mine and of the agent (if any),
- (c) the name and address of the manager of the mine,
- (d) the name of the competent person or persons appointed under Rule 3, and
- (e) the system of signals provided in accordance with Rule 12.

3. The manager or some competent person or persons appointed in writing, by the owner, agent or manager for the purpose shall, at least once in every 24 hours, inspect every part of a mine in or through which any person has to work or pass, and, if more than 20 persons are employed in the mine simultaneously, shall without delay write or cause to be written a report of such inspection in a book, to be called the Daily Report Book. Every such report shall be signed by the person making the inspection.

APPENDIX IV—*contd.*

MISCELLANEOUS.

Statement No. 6—*contd.*

4. Where any person required by these rules, or by any special rule made under Section 21 of the Indian Mines Act, 1901, to make any report is unable to write, he shall be present when his report is written for him, and shall have it read over to him, and shall attach his thumb-mark to it. The person writing the report shall also sign his name at the end, together with a statement that it has been read over to the person for whom it was written.

5. All books which are required to be kept under these rules, together with a copy of the Indian Mines Act and of all rules applicable to the mine, shall be kept at an office or other building as near as conveniently may be to, and used in connection with the working of the mine, and shall be produced on the request of an Inspector of Mines, a Magistrate, or any person authorised in that behalf by the local Government.

PART II.

SHAFTS AND OUTLETS.

6. (a) At every mine, other than an open quarry, where more than 20 persons are employed below ground, or where in the opinion of the local Government it is necessary, there shall be at least two shafts or outlets, not nearer to one another than twenty feet, affording separate means of ingress and egress available to all the persons employed in the mines.

(b) Proper arrangements shall be made for persons to descend to and ascend from the mine at each of such shafts or outlets. If apparatus is necessary, it shall be kept on the works belonging to the mine and shall be constantly available for use.

(c) The foregoing provisions of this rule with respect to shafts and outlets shall not apply—

(i) while a shaft is being sunk or an outlet being made;

(ii) to any working for the purpose of making a communication between two or more shafts or outlets.

(d) In cases where there are special difficulties which make compliance with the foregoing provisions of this rule not reasonably practicable, the mine may be exempted therefrom by the local Government, subject to such conditions as it may think fit to impose.

PART III.

VENTILATION.

7. An adequate amount of ventilation shall be constantly produced in every mine, to such an extent that the shafts, tunnels and working places of the mine, and the travelling roads leading thereto, shall be in a fit state for working and passing therein.

PART IV.

EXPLOSIVES AND SHOT-FIRING.

Storage of explosives in mines prohibited.

8. No explosive substance shall be stored in the mine.

9. No explosive substance shall be taken into the mine except in secured cases or boxes, containing not more than 5 lbs. each, and a person shall not have in use, or keep for use, at one time in any one place within the mine, more than one of such cases or boxes. The place in the mine at which any such case or box is in use or is kept for use, unless solid ground directly intervenes, shall not be less than thirty feet from a place at which any other such case or box is in use or kept for use.

Provided that an Inspector of Mines may, in special cases and by order in writing, permit, subject to such limitations as he may prescribe, the use at one time in one place of more than one of such cases or boxes.

10. No detonator shall be carried or kept in the same case or box with any other explosive material.

Detonators.

APPENDIX IV—contd.

MISCELLANEOUS.

Statement No. 6—contd.

- 11. No person shall use any iron or steel implement in the process of charging or stemming for blasting.
Iron or steel implements.
- 12. Blasting shall not be commenced until such warning as will prevent danger to the persons working in the mine and its vicinity has been given, by an efficient system of signals or by other means arranged by the manager. Notice shall similarly be given as soon as blasting is finished.
Warning to be given before and after blasting.
- 13. If a shot has, or appears to have, missed fire, no person shall approach the place until at least one hour has elapsed, unless the attempt to fire the shot has been made by electrical means when this interval may be reduced to fifteen minutes after the battery has been disconnected.
Misfires.
- 14. After a hole has been charged and made ready for firing, no person shall remove or attempt to remove anything therefrom.
Removal of things from holes which have been charged.
- 15. A new shot-hole shall not be commenced in any portion of a shot-hole left by a previous shot.
New shot holes.
- 16. If a shot has missed fire, no new hole shall be commenced within twelve inches from the hole in which the misfire occurred, and care shall be taken to drill the hole in such a direction that there is no danger of touching the unexploded charge.
The new hole shall be bored in the presence of the manager or of the person who exercises daily personal supervision over the mine or that section thereof, and also, if possible, of the man who bored the hole in which the misfire occurred. Such manager or person exercising daily personal supervision shall also be present during any operations undertaken for the removal of rock within six feet of the unexploded charge.

PART V.

SAFETY OF PERSONS EMPLOYED.

- 17. The roofs and sides of all travelling roads and working places shall be made and kept secure.
Roofs and sides of travelling roads and working places.
- 18. In open workings the overburden and all loose ground and material shall be removed sufficiently far from the edge, or otherwise made secure, in order to prevent danger to persons employed in the mine.
Overburden, loose ground and material.
- 19. The sides of open workings shall be sloped, stepped or secured, in such a manner as to prevent danger from falls of material.
Sides of open workings.
- 20. When an open working is worked in steps, the steps shall be of sufficient breadth in comparison with their height to secure safety.
Steps in open workings.
- 21. Every flywheel and all exposed and dangerous parts of the machinery used in or about a mine shall be kept securely fenced.
Fencing of exposed and dangerous parts of machinery.
- 22. Where no enactment for the regulation and inspection of steam boilers and prime movers is for the time being in force every steam boiler, whether separate or one of a range, shall have attached to it a proper safety valve, and also a proper steam gauge and water gauge, to show respectively the pressure of steam and the height of water in each boiler.
Steam boilers.

PART VI.

MISCELLANEOUS.

- 23. Any place in or about an excavation which is dangerous shall be, and shall be kept, securely fenced. Should any doubt arise as to whether a place is dangerous or not, the opinion of an Inspector of Mines, or of the District Magistrate within whose jurisdiction the excavation is situated, shall be conclusive on the point.
Fencing of dangerous place in an excavation.
- 24. Where an excavation extends within fifty feet of a public road or dwelling house, substantial fencing shall be erected and maintained around the excavation adjacent to the road or dwelling.
Fencing of excavation near public road or dwelling house.

APPENDIX IV—*concl'd.*

MISCELLANEOUS.

Statement No. 6—*concl'd.*

25. Where a place is likely to contain a dangerous accumulation of water, the working-approaching that place shall not, at any point within thirty feet thereof, exceed six feet in width or height, and there shall be constantly kept at a sufficient distance, not being less than five feet in advance, at least one borehole near the centre of the working, and sufficient boreholes on each side, and, where necessary, above or below.
26. A sufficient supply of good drinking water shall be provided or kept in or near the mine, so as to be easily accessible to all persons employed in or about the mine, and care shall be taken to secure that the supply remains free from contamination.

B. ROBERTSON,

Secretary to the Government of India.

Statement No. 7.

LAND ACQUISITION (MINES) ACT, 1885.

Particulars required to be furnished by colliery owners to Local Governments when giving notice under Section IV of the Land Acquisition (Mines) Act, 1885, of their intention to work coal under land acquired for a railway.

- (a) The name, residence and profession of the person giving the notice.
- (b) The name of the mine together with that of the village and district in which the mine is situate.
- (c) The name of the railway line or of the siding and the main line to which the siding is attached, under which the mine is situate.
- (d) The names of the railway stations and the mileage between which the said siding or the said portion of the railway land, under which the mine is situate, falls.
- (e) The number and date of the declaration under which the land was acquired.
- (f) A tracing showing the boundaries of and the area over which the acquired land extends.