

Department of Mines, India.

REPORT

OF THE

CHIEF INSPECTOR OF MINES IN INDIA

Under the Indian Mines Act (VIII of 1901)

FOR THE

YEAR ENDING 31st DECEMBER

1913

BY

R. R. SIMPSON, M. Sc.,

Offg. Chief Inspector of Mines in India



CALCUTTA
SUPERINTENDENT GOVERNMENT PRINTING, INDIA
1914

CONTENTS.

	Page.
-INTRODUCTION-	
Relates to administration of the Act	1
Other mining statistical publications	1
Scheme of report	1
 SECTION I.—PERSONS EMPLOYED—	
Average figures of labour	1
Increase compared with preceding year	1
" chiefly in coal mines	1
Labour, not much complaint of shortage of, in the Jharia coal-field	1
" shortage in the Raniganj coal-field becoming acute yearly	1
" suitable recruits in Assam for, being experienced	1
" new recruits in Assam for, are chiefly Nepalese and Chinese	1
" supervision of Nepalese and Chinese, in Assam difficult	2
" difficulty of supervision of, in Tavoy very acute	2
Underground mining in Tavoy done by Chinese	2
Employment of criminal tribe for labour experimented at Kalichedu mica mine, Madras	2
 SECTION II.—OUTPUT OF MINERAL—	
Coal output a record	2
" compared with previous years	2
" raising restricted in Bengal and Bihar owing to floods	2
" industry appears to be in a remarkably healthy condition	2
" increase chiefly in Bengal and Bihar and Orissa	2
" mainly from the Jharia coal-field	2
" output, rapid expansion of, in the Jharia coal-field not likely to be maintained	2
" increases in the Raniganj and Giridih coal-fields	2
" decline in, in the Bokaro-Ramgarh coal-fields	2
New extension of the Bengal Nagpur Railway being pushed forward in the Bokaro-Ramgarh coal-field	2
Coal output, large, in the Bokaro-Ramgarh coal-field expected	2
" decrease in, in Assam owing to scarcity of labour	2
" increase in, in the Central Provinces, Baluchistan, Panjab and North-West Provinces	2
" per person in various provinces	2
" " " " England	2
Mica output, increase not marked	3
" compared with preceding year	3
" declined in Madras	3
" increase mainly from Bihar and Orissa	3
" increased in Ajmer-Merwara	3
" market, for large slabs of good quality and for splittings of fine quality was well maintained	3
" value of smaller grades of stained quality declined	3
" no business in inferior splittings during latter half of year	3
" electrical industry was little affected by general industrial depression	3
" improvement in mining methods maintained	3
" superficial mining giving way to deeper and more systematic working	3
" continuance in size and richness of the veins lending stability to the industry	3
" labour saving devices supplanting old fashioned methods	3
" hand drilling continues to find favour	3
" Kodarma Mica Mining Association proving valuable for protecting owners' interests	3
Manganese output, increase of	3
" trade same as in preceding year	3
Gems output, decrease in	3
" the whole comes from the Mogok mines	3
" any market change there was was for the worse	3
Gold output, increase of	4
" all from Anantapur	4
Wolfram, use of	4
" Tavoy is the largest producer of, in the world	4
" increase of	4
" revenue from	4
Chromite renewed activity in Baluchistan	4
" output, increase in	4
" use of	4
Iron output, increase in	4
Slate " " "	4
Tin " " "	4
Clay " " "	4
Fuller's earth output, increase in	4
Steatite " " "	4
Salt " " "	4
Copper ore output, decrease in	4
Limestone " " "	4
Galena " " "	4
Corundum " " "	4
Magnesite " " "	4
Samarskite " " "	4

	Page.
SECTION V.—GENERAL REMARKS—(cont'd.)	
Sibpur College Mining Department	19
Result of examination	19
Annual Mining Camp at Kustore	19
Mining Education in the Bengal and Bihar coal-fields	19
Meetings of Mining Educational Advisory Board	19
Lecturers for session, 1913-14	19
Raniganj centre opened	19
Increase of names on registers	19
Average attendance at each lecture	19
Result of seasonal examination	19
Examiners' report	19
Prof. E. H. Robertson's report	20
Removal of the Mining Department of Sibpur College	20
Mining and Geological Institute of India	20
Total membership	20
Meetings of—	20
Sub-committee appointed to investigate question of subsidence in the Bengal coal-fields	20
Government prize awarded to Mr. E. S. Tarlton	20
Three prizes offered by the Institute	20
Revision of the geological map of the Raniganj coal-field completed	20
Board of Examiners for coal mine managers' certificates	20
No change among members of Board	20
Meetings	20
Certificates granted	20
Examiners	21
Mining Boards in Bengal and Bihar	21
Bengal Mining Board Meetings	21
Draft rules of the Bengal Mining Settlement Act considered	21
Bihar and Orissa Mining Board Meetings	21
Draft rules of the Bengal Mining Settlements Act considered	21
Official duties	21
APPENDIX I.—STATISTICS OF MINES AND MINERALS—	
TABLE No. 1.—Number of mines and workers and output of minerals	23
" " 2.—Number of mines opened and closed	35
" " 3.—Fluctuations of output	37
" " 4.—Coal raised and death-rates	38
" " 5.—Coal raised per person employed in various countries	38
APPENDIX II.—ACCIDENTS IN MINES—	
TABLE No. 1.—List of fatal accidents	39
" " 2.—Fatal and serious accidents	62
" " 3.—Fatal accidents and deaths classified according to age and sex	66
" " 4.—Fatal accidents classified according to cause	67
APPENDIX III—	
Prosecutions under the Mines Act	68
APPENDIX IV.—MISCELLANEOUS—	
STATEMENT No. 1.—List of inspection circles	69
" " 2.—List of certificate-holders	70
" " 3.—List of mining universities	71
" " 4.—Sibpur mining classes	72
" " 5.—Mining instruction in Bengal and Bihar and Orissa	74
" " 6.—Particulars to be furnished under Section 4, Land Acquisition (Mines) Act, 1885.	76
" " 7.—Rules under Bengal Mining Settlements Act, 1912	76

FROM

R. R. SIMPSON, Esq., M.Sc.,
Officiating Chief Inspector of Mines in India,

TO

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

Dated Dhanbaid, 20th June 1914.

SIR,

I HAVE the honour to submit the report upon the inspection of mines in British India for the year ending 31st December 1913.

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 1913 the average number of persons working in and about the mines regulated by the Indian Mines Act was 181,260, of whom 116,492 worked underground and 64,768 on the surface. One hundred and eleven thousand, nine hundred and forty-six were adult males, 62,961 were adult females, and 6,353 children under 12 years of age. This is an increase of 16,958 workers or 10·32 per cent.

The increase related chiefly to those employed in coal mines, whose numbers increased by 11,650.

This increase is practically the same as that in the number of those working in the coal mines of Bihar and Bengal where, in 1913, 11,196 more persons were employed than in 1912. There was not much complaint of labour shortage in the Jharia coalfield, but in the Raniganj coalfield the difficulty in securing a full complement tends to become more acute yearly.

At the Margherita coal mines in Assam increasing trouble in obtaining suitable recruits for the labour force is being experienced. The new recruits are chiefly Nepalese and Chinese, and their employment renders proper

supervision extremely difficult, as they have no knowledge of the local dialects or of Hindi.

The same difficulty in respect of supervision is even more acute in Tavoy where practically all the underground mining is done by Chinese.

At Kalichedu mica mine in the Nellore district of Madras the experiment of settling a criminal tribe at the mine has been made. The community numbers about 1,500 persons, including women and children, and it forms the largest penal settlement in India. At first it was found that they did not take kindly to manual labour, but as they gained experience they became more willing and proficient. The men are paid from 3 to 5 annas daily and although they do not do as much work as ordinary free labourers yet, in view of the labour scarcity prevailing, their employment is considered to be a success.

Section II.—Output of Mineral.

COAL.

The output again constitutes a record, being 15,486,318 tons. This is an increase of 10·27 per cent. over the output for 1912 when 14,044,368 tons were raised from the mines. Since 1909, when a decrease of 7 per cent. was recorded, the successive annual increases have been 0·83, 5·80, 16·56 and 10·27 per cent. The drop in the rate of increase is probably accounted for by the restricted raisings consequent on the flooding of many mines in Bengal and Bihar during the year when abnormal floods were experienced in the coalfields. The loss of output directly due to the floods will probably be again reflected in the figures for 1914 as many mines are still suffering from the effects of inundation.

Judging from the present prices of first class coal in the market, and from the fact that many coal companies are contracted forward for long periods at remunerative rates the coal industry appears to be in a remarkably healthy condition.

Of the total output 14,876,241 tons or 96·06 per cent. were raised in Bihar and Bengal; the percentages in the previous three years being 94, 94·64 and 95·19, respectively. The increase in these two provinces was 1,446,675 tons, or slightly greater than the increase for the whole of India which was 1,441,950 tons. The increase comes mainly from the Jharia coalfield where there was an increase of nearly one million tons or 12·48 per cent.

Owing to the extent to which the deeper lying areas of the first class seams of coal are burnt by igneous intrusions, as proved by recent sinkings and borings, the rapid expansion of the output of the Jharia coalfield is not likely to be maintained in the near future. There were increases of 7·75 and 10·44 per cent., respectively, in the Raniganj and Giridih coalfields.

The output of the Bokaro-Ramgarh coalfield declined from 5,310 tons to 2,855 tons. The new extension of the Bengal-Nagpur Railway is, however, being rapidly pushed forward, and a large output may be expected from this field within the next few years.

In the provinces other than Bihar and Bengal the only decrease in output occurred in Assam where 270,364 tons were raised. The decrease was 8·85 per cent., and it was due to scarcity of suitable labour. The increased percentages in the other provinces were:—

Central Provinces 0·71 per cent., Baluchistan 15·74 per cent., Panjab 32·89 per cent. and North-West Frontier Province 80 per cent. In the last mentioned province the output is negligible.

The output per person employed during the year was (a) below ground 183 tons, and (b) above and below ground 116 tons. The figures for the five years preceding were (a) 169 and (b) 108. Taking each group of coalfields separately these figures were as follows:—Bengal and Bihar (a) 186 and 172, (b) 118 and 110; the Central Provinces (a) 126 and 123, (b) 88 and 86; Assam (a) 163 and 246, (b) 110 and 155; Baluchistan (a) 74 and 69, (b) 49 and 46, and the Panjab and North-West (a) 85 and 45, (b) 57 and 27. The output in England in 1912 was 311 tons per person employed below ground, and 251 tons per person employed above and below ground.

MICA.

The increase was not so marked as in the two previous years. The output was 43,650 cwts. as compared with 41,660 cwts. in 1912. The Madras output, in spite of an increase of 816 cwts. from the Salem district, declined by 15.07 per cent. The increase comes mainly from the province of Bihar and Orissa, but the production of Ajmer-Merwara increased from 641 cwts. to 1,673 cwts.

The market for large slabs of good quality and for splittings of fine quality was well maintained, but towards the end of the year the value of smaller grades of stained quality declined. The year closed with heavy stocks of inferior splittings in Europe, and no business in that grade was carried through during the latter half of the year.

The electrical industry, on which the mica market is so largely dependent, was little affected by the general industrial depression in Europe, but appears to be lagging now.

The improvement in mining methods referred to in previous reports is maintained. The superficial nature of the mining is giving way to deeper and more systematic working which is proving that the deposits are not confined to the surface. The uncertainty as to persistency of the deposits which has prevailed in the past is being gradually dissipated by the continuance in size and richness of the veins in depth. This fact is lending stability to the industry, and encouraging capitalists to make permanent provision for the future.

Labour saving devices are being introduced to supplant the old fashioned methods of raising rock and water by manual labour. It is not uncommon to see a string of some twenty coolies raising the produce of three drills whereas by means of simple machinery three coolies might deal with the rock produced by twenty chisels.

Hand drilling continues to find favour with the operators and it seems unlikely to be superseded by mechanical means owing to the damage to the crystals that may follow the use of machine drills, but there is no doubt that the use of double-handed drills employing two strikers and a turner would effect greater speed than is possible at present without increasing the risk of damaging the crystals.

In the Hazaribagh district the careful nursing of the industry by the Kodarma Mica Mining Association is having beneficial results, and the Association is proving a valuable instrument for protecting the interests of the owners.

MANGANESE.

The output of manganese ore increased by one-half, being 637,391 tons as compared with 423,464 tons in 1912, but it was still 0.73 per cent. below the record year of 1907 when the Russian output fell away by reason of the war with Japan, and there was a greater demand for Indian ores.

From the point of view of the producer the state of the trade was much the same as in 1912, for although the average price per unit was as high as eleven pence yet the abnormally high ocean freights absorbed all the additional profit. During the latter half of the year freights improved, but at the same time the price of ore dropped to ten pence per unit.

GEMS.

The increase of 12.15 per cent. recorded last year has been wiped out by a decrease of 13.78 per cent. in the output of gems during 1913. The figures are 278,706 carats as compared with 323,247 carats in 1912. The whole of the output comes from the Mogok mines in Upper Burma and consists of rubies, sapphires and spinels.

Any change which there was in the market for these gems was for the worse both in demand and prices. The boom in sapphires was not altogether maintained though cut stones of the best quality continued to fetch remarkable prices.

GOLD.

The output increased from 7,269 ounces to 11,019 ounces, all of which comes from the Anantapur district in Madras.

The increase is 51.59 per cent. Except for 244 ounces from the Jibutil mine the production was entirely from the North Anantapur mine, which continues to show high values.

WOLFRAM.

This valuable mineral is used in the manufacture of the specially hard steel used as armour plate in war-ships and in the tungsten filament lamp. The district of Tavoy in Lower Burma is now the largest producer of wolfram in the world. The possession of these deposits is a valuable asset to the Empire.

The output was 27,520 cwts. This represents only the small increase of 8.34 per cent. on the figures for the previous year, but there is every indication that there will be a more substantial increase in future years.

The direct revenue from wolfram collected by Government amounted to 1½ lakhs, whilst the indirect revenue probably was much greater.

Up till the present time large capitalists have, except in one instance, held aloof from the industry, but the facility with which certain owners have been able to develop their mines from revenue has attracted attention and it appears probable that before long firms of considerable financial standing will exercise options over certain mines.

There has been a considerable increase in underground mining and at one mine not less than 20,000 feet of driving has been done.

CHROMITE.

There was renewed activity in chromite mining in the Zhob district in Baluchistan where of recent years the production has steadily dwindled. The output was 3,414 tons. The production in 1912 was only 6 tons and this came from the Quetta-Pishin district.

The mineral is chiefly used in the manufacture of specially hard steel, and it commands a high price.

OTHER MINERALS.

There were increases in iron, slate, tin, clay, fullers' earth, steatite and salt, and decreases in copper ore, limestone, galena, corundum, magnesite and samarskite.

Section III.—Accidents.

During the year 1913, at mines regulated by the Indian Mines Act, 1901, there were 136 fatal accidents, being an increase of 3 as compared with the number in 1912, and an increase of 6 as compared with the average number of the last five years.

These accidents involved the loss of 211 lives. This is an increase of 26 upon the number of deaths in 1912. In the report for 1912 it was stated that one accident caused 23 deaths. The year under report was a peculiarly unfortunate one as regards the large loss of life occasioned by certain accidents. Twenty-seven lives were lost on the occasion of an explosion, twenty-seven by three irruptions of water and seven by a fall of roof.

Of these 136 accidents, I regard (a) 60 as being due to misadventure, (b) 33 to the fault of the deceased, (c) 7 to the fault of fellow workmen, (d) 8 to the fault of subordinate officials, and (e) 28 to the fault of the management.

Very many of these accidents might have been prevented by the exercise of ordinary care and forethought on the part of both officials and men, and I am satisfied that only by closer supervision and stricter discipline can their number be diminished. Such accidents result from persons passing through fences into old workings to get easily worked coal, from persons sitting in

dangerous places or under roof coal at which they have just been working, from persons being struck down by falling roof and sides as they travel to and from their working places, and from disobedience to an official's orders in trivial matters.

It is by no means an uncommon occurrence for persons to be killed in a mine whose presence there was entirely unknown to the officials. In the case of mines with entrances on the outcrop a simple way of preventing persons from unauthorized entrance would be to provide a barred gate completely filling the opening. The gate would be furnished with a lock of which the key would be in the charge of a responsible official. An arrangement could easily be made by which the lock could be turned from within, but only by the use of the key from the outside. Such a provision would undoubtedly reduce the number of accidents and improve control over the labour force.

A point to which attention may be directed is the desirability of raising the standard of qualifications demanded from the subordinate officials, particularly sirdars. Men drawn from the ranks of the coal miners themselves, often with relatives working under them, in some cases paid partly by commission on output, and frequently receiving their salaries from contractors for coal getting, cannot be expected to command the respect and to wield the authority which their position demands. To obtain the right class of men a general increase in the rates of pay would be necessary, but I am of the opinion that the result would justify the expenditure. Educational facilities for subordinate officials have been provided in the Jharia and Raniganj coalfields since 1906, and funds have now been sanctioned for the extension of these facilities to persons who speak only the vernaculars.

The death rate per thousand persons employed was 1.16, while that of the preceding four years was 1.17. At coal mines only these figures were 1.39 and 1.32, and at mines other than coal 0.54 and 0.74. At coal mines in England during the ten years ending with and including 1912, the death rate per thousand persons employed varied from 1.17 (lowest) to 1.69 (highest).

The death rate per millions of tons raised at coal mines only was 11.95, while that of the preceding four years was 11.97. At coal mines in England during the ten years ending with and including 1912 the death-rate per million tons raised varied from 4.29 (lowest) to 6.37 (highest).

Of the persons killed 169 were males, 41 females and 1 child.

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

One hundred and eighty-five in coal mines, 7 in manganese mines, 9 in gold mines, 6 in wolfram mines, 1 in copper mines, 1 in clay mines, 1 in salt mines, and 1 in limestone mines.

Twenty-nine persons lost their lives by explosions of fire-damp; 78 by falls of roof and sides; 29 in shafts; 1 by suffocation by gases; 2 by explosives; 30 by irruptions of water; 16 by haulage; 14 by other accidents underground, and 12 on the surface.

I regret to record that there has been a decrease of only one in the number of deaths from falls of roof and sides. The increase in the number of deaths from explosions of fire-damp is due to the lamentable disaster at Chowrasi coal mine by which 27 persons lost their lives.

A list of these accidents appears in Appendix II, Table I. In addition to them there were 36 others, causing the death of 38 persons. These also appear in Appendix II, Table I, but are listed separately, a reason being given in each case for their exclusion from the statistical tables.

In the Bengal and Bihar coal mines, where most of the statistical accidents occur, there were 162 deaths compared with 137 in 1912; but it may be remarked that the year has witnessed four disastrous occurrences in these provinces, caused by floods and an explosion, which are responsible for 54 deaths. If the large accidents of both years are eliminated the number of deaths is 108 compared with 114 in 1912.

In the last report an accident due to an irruption of flood water from the surface, causing 23 deaths, was mentioned. Previous to 1912 accidents from

this cause had been exceedingly rare. Since 1896 only one accident causing two deaths had occurred, and it was hoped that such an accident as the one above referred to would not occur again. In the year under report, however, no less than four accidents occurred from this cause involving the loss of 13, 2, 7 and 7 lives, respectively. In the first three cases, nalas or rivers overflowed into the mines, and on the occasion of the last of these three accidents many other mines were flooded and completely filled, fortunately without loss of life. It has taken many months for some of them to be dewatered. In the fourth case a rise gallery had been driven much too near the bed of a small nala, and on the same night as that just alluded to the water of this nala, which was in high flood, burst into the gallery. As detailed further on, it is possible that the escape of the persons drowned was cut off by gradually rising water before the nala broke in, but it is almost certain that they were actually drowned by its breaking in.

I trust that these occurrences will make managers realise the great danger which may arise where inclines or shafts are sunk near nalas or rivers or in low-lying ground, and how important it is that they should be on the alert when heavy rain brings about a large flood. The practice of driving galleries too near the surface when such surface forms a portion of or is near to a nala or low-lying ground is a dangerous one, and in all suspected cases a careful check survey and levelling should be made so that the exact position may be ascertained, and if found necessary protective works should be undertaken.

A reference may here be made to the special report following on the withdrawal of workmen through sudden danger required to be made by rule 5 of the rules for coal mines established under section 20 of the Indian Mines Act, 1901, and published in Government of India Notification No. 864-68-20, dated the 10th March 1904. Cases have come to notice in which colliery managers have considered that the law has been complied with when such occurrences are recorded in the book in which ordinary daily inspections under rule 4 are recorded. This is not the case. A separate book, conveniently called the "Special Danger Book," should be kept for the record of cases in which withdrawals of workpeople have been necessitated.

A feature of the year's working is the large number of accidents that can be traced, directly or indirectly, to goafing operations. There were 24 such accidents out of a total of 60 caused by falls of roof and sides. Goafing is rapidly on the increase and will in time be practised at every mine, but it should be remembered that the supervision which is adequate for gallery driving will not suffice for goafing. Generally speaking the work has not been systematized and until it is accidents are bound to occur. Insistence on props being set before goafing commences, and at a definite distance apart while it is in progress, and on the removal of all overhanging side and the support of fractured corners of pillars, will do much to eliminate many of the dangers that are inherent in this class of work.

I would also venture to draw the attention of managers to the fact that 7 accidents occurred in shafts that would unquestionably have been prevented by the use of proper fence gates on the cages. Their use has become compulsory in Great Britain, and I trust managers in India will be more liberal in their views on this question and provide gates on all cages.

During the year steps were initiated for the establishment of special rules for coal mines under section 21 of the Act. The statutory procedure is cumbersome and delays are unavoidable. In the Jharia coal-field, owing to Hindi having recently been permitted as a vernacular language in the courts, the process of establishing the rules is delayed pending the receipt of a satisfactory Hindi translation.

EXPLOSIONS OF FIRE-DAMP.

No. 1.—Saltore Coal Company, Limited's Saltore coal mine.

This explosion occurred on a main level gallery between two shafts, which have recently been connected to each other by means of this gallery, which forms the only connection. At a point upon its roof stone, 2' 6" in thickness,

was being taken down to make the gallery 8 feet high, and the sides were being dressed near the same place to give a width of 9' 3".

On the day of the accident the manager was underground until 1 P.M., when he returned to the surface. At the same time the regular shot firer left the pit for the day, having had leave to do so.

It appears that about 5 P.M., the man who had the contract to increase the height and width of the gallery obtained the shotfiring battery from the engine house on the surface, where it had been placed temporarily, and fired first two shots in the roof and then three shots in the sides, one on one side and two on the other. While firing these shots the contractor and two miners were standing at a point 163 feet from the roof shots. The side shots were 11 feet nearer. The contractor was round the corner of a rise gallery, but the miners were on the level, between a tub and a brattice sheet.

Nothing untoward occurred when the roof shots were fired, but on the firing of the side shots there was a rush of flame and the two miners were burnt. They both walked out of the pit. One recovered but the other died two days afterwards. The contractor was uninjured. He was not authorised to fire shots and was fined and dismissed.

It was ascertained that, owing to a defect in the winding engine, the winding of water at the downcast shaft was stopped in the middle of the day for one-and-a-half hours. The rising of the water must have reduced the sectional area of the air passage near the bottom of the shaft, thus affecting the ventilation. The result was that gas accumulated at the place where the shot was fired. The roof shots probably gave off no flame, but one at least of the side shots must have done so, and the gas was ignited by it.

The colliery was worked exclusively with safety lamps. Since this accident the owners have drawn up a strict code of byelaws to regulate shot-firing.

No. 2.—Indian Collieries Syndicate Limited's Jamadoba coal mine.

This explosion occurred in a main level gallery which was being driven to connect with another main gallery which was being driven towards it. There were only a few feet of intervening coal between the two galleries.

Work had been proceeding during the week previous but had finished on Friday the 25th July. No work had been done on Saturday, Sunday or Monday. On Tuesday two main gallery men, one of whom was deceased, came to the mine and went down without apparently first seeing the sirdar or waiting to see him. They went down to the mouth of the narrow gallery, at the mouth of which there was a large heap of coal brought out from the face. Kaila Meah sat down, and deceased, with a candle in his hand, went into the gallery. According to Kaila Meah the deceased had only gone in about 15 feet or so when there was a roar and a flash which did not come out as far as he was. He ran in and helped deceased out and up through the barrier to the pump where they met the sirdar. When the manager arrived he found deceased sitting at the top of the incline and had him sent home on a charpoy.

It transpired at the inquiry into this accident that two years previously there had been a slight explosion of gas in this mine. Some little time afterwards, when the regular manager was on leave, orders were given by the agent that an inspection with a safety lamp must be made after the week end stoppage. The practice was discontinued on the return of the manager from leave. About three weeks before this accident one of the main heading drivers reported that he thought he had smelt gas at the place where the accident occurred. The manager made a test both with a safety lamp and with an open light and reported to the agent that he had found no gas. There probably had been gas there, but it had been diffused before the arrival of the manager.

It was, I consider, an error of judgment on the part of the manager not to have resumed the test for gas with a safety lamp after the week end stoppage, on hearing from the main gallery driver that he thought he had smelt gas.

The sirdar in charge said he knew there was a rule that workpeople should not go into the mine, after the week end stoppage, before he had made his

inspection, but that the main gallery drivers were accustomed to disregard the rule. As he again allowed the rule to be broken after the inquiry into this accident, he has been dismissed.

No. 3.—The Equitable Coal Company, Limited's Chowrasi coal mine.

Ignitions and explosions of gas have occurred in India from time to time, but this is the first occasion on which this Department has had to record an outbreak of fire which resulted in an explosion on a very large scale in which coal dust played the prominent part it frequently does in such catastrophes and accounted for the large area traversed by the explosion and for the violence and force accompanying it.

The mine, as will be seen by reference to plan A, consists of six inclines and six airshafts all of which are connected. Measuring along the strike, the distance from the extreme east of the workings to the extreme west is 6,500 feet. Measuring from the outcrop down the dip the face of the workings is 2,400 feet from the mouth of the inclines. There is therefore an area of 15,600,000 square feet of workings, consisting of pillars and galleries, the latter aggregating $62\frac{1}{2}$ miles in length.

The seam is the Dishargarh seam. It is here nine feet thick and dips towards the south at the rate of 1 in $3\frac{1}{2}$.

At about 5-20 P.M. on the afternoon of the day on which the accident occurred, when about 420 persons were at work in the mine, smoke was seen issuing from the mouth of No. 3 incline, and at the same time some of the workpeople rushed out to the surface. The manager, who happened to be at the top of the incline at the time, descended to a point about 10 feet below the entrance and found a large quantity of smoke coming up. Orders were given to clear the mine by way of the other inclines and to stop the ventilating fan.

At about 7-25 P.M. after a brattice had been put up at No. 2 incline and while an attempt was being made to put a stopping in the mouth of No. 1 incline, which was downcasting, a violent explosion took place, the tops of Nos. 1, 2, 3, 4 and 5 inclines were wrecked, the brick chimneys built over Nos. 1, 2 and 4 airshafts were blown down and the following casualties occurred on the surface. One mistry at No. 1 incline was injured so seriously that he died next morning, and at No. 4 incline one sirdar and one coolie were killed outright. Five minutes afterwards a second explosion occurred, another at 7-42 and four others at 8 P.M., 8-20 P.M., 9 P.M., and 9-5 P.M. The second explosion was a violent one, but the others decreased in intensity, and the last two were very slight. The first two were heard distinctly at Raniganj, 19 miles away.

Large masses of brickwork were hurled several feet and No. 1 engine house which is 250 feet from the incline looked as if it had been bombarded. The interior of the engine house was covered with pieces of brickwork, some of which had been hurled against the back wall. Every pane of glass in the fan engine house at No. 2 airshaft was shattered.

Coked coal dust was noticed near the top of No. 4 airshaft.

In a few hours flames 80 feet high were coming out of some of the inclines and shafts. Nos. 1 and 6 inclines and their airshafts were downcasting strongly, but smoke and flame continued to pour out of No. 3 incline and airshaft and No. 4 airshaft.

The work of closing the mine down by sealing up these six inclines and shafts took several days.

In addition to the three men who were killed on the surface by the first explosion, it was ascertained during the next few days, as the result of inquiries made by the management and the police, that twenty-four others were missing. Of these persons nineteen worked in galleries near the face of No. 3 incline and five on the haulage road.

They were probably suffocated by the increasing smoke on the main No. 3 incline as they attempted to escape that way. Owing to the unusual steepness

of the incline, it would very soon become a flue, in which smoke would ascend at a rapid rate.

This accident was made the subject of an inquiry under section 18 of the Indian Mines Act. One man, a pumpman, named Sahadat Sheik, who was one of those who escaped, was an eye-witness of the initial conflagration and was therefore able to give extremely valuable evidence. He was employed at a pump near the face of the companion dip of No. 3 incline. He stated that the surveyor babu and a sirdar came to extend the chalk centre line of No. 3 incline main dip gallery, and that when the surveyor raised his candle near the roof there was a flame, which, in spite of the efforts of the two men to put it out, increased and moved about, until a brattice sheet, erected longitudinally in the gallery caught fire. He then ran away.

The face of the dip gallery, and the position of the pump and brattice sheet are shown on plan B.

There is no doubt that the surveyor lit an accumulation of gas in this dip gallery. It is probable that the men working there that morning struck into a feeder of gas. The gallery was visited at 8 A.M. by the assistant, who found no gas. The feeder therefore must have been struck into after his visit. One of the men who were working there from 9 A.M. till midday stated that he saw no gas. This is possible. It might not be noticed at the time as the movement of the miners passing to and fro would dissipate it, but after work had ceased this would not be the case, and by the time the surveyor reached the place it was probably an accumulation of considerable size.

The subsequent explosion was probably caused by the burning brattice cloth and timbers heating up the small coal, which is usually lying on the floors of galleries, and eventually the solid pillars of coal, to such an extent that volatile gases were liberated from the coal in much the same way as these gases are given off in a coke oven. The Dishargarh seam is very rich in volatile gases which are easily liberated from the coal when the latter is heated. These gases when mixed with about ten times their own volume of air and ignited would explode with great violence and raise into suspension the fine coal dust lying about the sides and roof of the galleries of the mine. This coal dust would in turn explode and raise more dust which would also explode and thus carry the explosion throughout the whole of the workings.

It cannot be stated definitely that the stopping of the fan and the sealing off of Nos. 1 and 2 inclines had any influence on the occurrence of the explosions, but it is a significant fact that when, after the explosions, the fire had gained such a hold on the workings as to induce enormous quantities of air to pass down Nos. 1 and 6 inclines and airshafts—110,000 cubic feet of air per minute were measured at No. 6 incline alone—it burned for three or four days without any further explosion occurring. It would probably have been better to have slowed down the fan instead of stopping it altogether.

The sealing off was eventually effected by filling in those inclines and shafts which were smoking and flaming, leaving the intakes untouched. This went on until only No. 1 shaft (upcasting) and No. 6 incline (downcasting) were left open. The work of filling up No. 1 shaft was commenced first, and as soon as the flame and smoke were somewhat checked, No. 6 incline was gradually closed with corrugated sheets.

The Dishargarh seam gives off gas in some mines, and the neighbouring mine to Chowrasi was and is worked exclusively with safety lamps. Chowrasi was worked as an open light mine, except that in certain forward drivings, including the face of No. 3 incline, safety lamps were used as a precaution. Altogether there were about 35 safety lamps and about 400 naked lights in general use. In rule 15 of the rules for coal mines it is laid down that no lamps but safety lamps shall be used "in any place in a mine in which there is or is likely to be any such quantity of inflammable gas as to render the use of naked lights dangerous." To the rule the following important proviso is attached:—"And when it is necessary to work the coal in any part of a ventilating district with safety-lamps, it shall not be allowable to work the coal with naked lights in another part of the same ventilating district situated between the place where such lamps are being used and the return airway."

The management of Chowrasi held that such gas as had been discovered was not of such quantity as to compel them to put in safety lamps generally in accordance with this rule. Inquiry has shown that they were justified in their views. Gas had been seen from time to time, but in very small quantities. On two occasions persons had been very slightly singed, and it was stated in evidence that gas was ignited by some person unknown in the No. 3 incline main dip about nine months previous to this accident. The manager on being apprised of the fact went there and found it burning. It is often possible to light a minute feeder of gas in this way, and it will burn innocuously until put out.

No gas had ever been found by an Inspector, but in 1911 the Inspector of Mines for the circle drew attention to the fact that gas was reported from time to time in the daily report book and suggested to the management that the ventilation should be improved. The result was that a fan was ordered from England and had been set to work a few days before the explosion occurred.

Having decided to use lamps as a precautionary measure in the forward drivings the manager should, in my opinion, have taken more care to see that anyone whose duties took him into them should be allowed no light other than a locked safety lamp. Both the surveyor and a boy accompanying him were in the habit of going about with naked lights. The fact that a small quantity of gas had been lit up in No. 3 incline main dip in the previous January, and that an inflammable brattice sheet was hung there called out all the more for caution.

FALLS OF ROOF AND SIDES.

No. 59.—R. M. Pal and Brothers' Kesalpur coal mine.

Disobedience frequently results in accidents. In this case five women entered a gallery that was under repair to load up dust coal. The repairer warned them that the gallery was not working and four of them left at once, but the fifth continued to work. Suddenly, and without warning, a large slab of coal measuring $10' \times 6\frac{1}{2}' \times 2\frac{1}{2}'$ thick at one end tapering to a feather edge at the other, fell from the side and killed her on the spot. The fall disclosed a slip of pronounced character. It is impossible to state whether its presence could have been detected by inspection, but there is no doubt that an examination by sounding would readily have detected its condition, and this should have been done by the sirdar when he made an inspection two hours before. For his negligence he was dismissed.

The sirdar removed the fence to allow the repairer to work, a proceeding that was unnecessary. It is always permissible for repairing work to be conducted inside a fence and of this fact more advantage might be taken by mine officials.

IN SHAFTS.

No. 85.—Eastern Coal Company, Limited's Bhowra coal mine.

This accident, which is illustrated by plan C, and the circumstances attending it present a powerful reason for the complete securing of those parts of shafts that are in coal.

The shaft in which the mishap occurred was sunk in 1906 to No. 14 seam which here attains a thickness of 38 feet. The shaft levels were driven 9' 6" high at a point in the seam 15 feet above the floor, which left $28\frac{1}{2}$ feet of coal exposed in the shaft.

This inset was in constant use for raising coal up to April 1913 when it became necessary to sink the shaft down to No. 13 seam. Coal raising was stopped and the shaft dismantled. The former pit bottom then became nothing but a middle landing. Sinking was started and continued without mishap to a further depth of 113 feet where No. 12 seam was reached.

Early in the morning of the 15th November 1913 the usual examination of the shaft sides was carried out by a sirdar who declared them safe, and then ordered five water bailers to descend the shaft to prepare the sump for the sinkers. After a few buckets of water had been sent to the surface a large

block of coal fell to the shaft bottom, killing three of the bailers outright and slightly injuring the other two. The evidence of the survivors shows that it occurred without the slightest warning. Subsequent examination disclosed the fact that the block of coal, which measured $8' \times 7' \times 6\frac{1}{2}'$, had formed the roof of the inset at the middle landing in No. 14 seam, and that it had carried away its supports. These consisted of a steel girder, $6" \times 5" \times 18' 4"$ long, which had been fixed under the roof next the shaft, and also 4 or 5 bars of round timber, 6" to 8" diameter, which had been let into the side at one end and supported on props at the other. The girder had been let into the solid coal at one end and supported on a projecting ledge of coal, 12" thick, at the other. This ledge had been broken through and the girder deflected 3' 3" by the weight of the block of coal, and the bars had been broken.

Two slips were revealed by the fall, and these, together with a smooth parting, were the primary causes of the accident. One slip ran into the side of the landing and could not possibly have been detected by examination and the other ran across it and may have been hidden by timber or not discernible at all. The existence of these slips was not known. Owing to the great thickness of the fallen coal it was not possible by any method of testing or of examination to ascertain its condition.

As there were no unusual disturbing features—the last shots in the sump had been fired 19 hours before — it would seem that weathering along the line of the slips, possibly hastened by the escape of steam from a pump situated close by, was the cause of the fall.

The support was obviously insufficient and, even had it been greater, applied as it was, collapse would most probably have occurred, as the hade of the slips caused the movement to be slightly lateral, and there was nothing on the shaft side to resist this movement.

The only practical support that could have been applied to resist this movement was masonry, and this should have been extended throughout the whole thickness of the seam exposed in the shaft. There are many shafts where the bricking up of each seam is carried out as soon as it is reached in the sinking, whether the coal is friable or not. This is an excellent practice, and I would recommend to colliery authorities the desirability of protecting all seams of coal that are exposed by sinking.

No. 88.—Lodna Colliery Company, Limited's Sripur coal-mine.

Special interest attaches to this accident in view of the large increase in the number of shafts in use in the coalfields. A piece of stone, measuring $24" \times 16" \times 5"$, fell to the bottom of No. 2 shaft, 910 feet deep, and killed a sinker there. This was the fourth accident of its kind at this mine during the previous seven months. The first one dislocated a man's wrist at No. 1 shaft, the second broke a sinker's leg in No. 2 shaft and the third killed a sinker, also in No. 2 shaft.

No trouble appears to have been experienced with stones falling till a depth of 640 feet was reached when a somewhat weak piece of ground, composed of shaley sandstone, 40 to 50 feet thick, was encountered. From this ground frequent falls occurred. Below this the ground was strong down to a depth of 880 feet, where almost vertical joints were met and a considerable amount of dressing by hand had to be done. Between these two pieces of bad ground, at a depth of 792 feet, the Koithee seam is met and there is a piece of false bedded shaley sandstone just above it.

On six or seven occasions men had been withdrawn because of stone falling, and only on one occasion was it possible to detect the place from which the stone fell.

The management has been much concerned with this unsatisfactory state of affairs and has done all in its power to secure immunity by dressing the sides and frequent inspections, but it is clear that more adequate precautions are necessary. I have since been informed that before continuing the sinking the weak ground will be secured by masonry.

IRRUPTION OF WATER OR FALLING INTO WATER.

No. 92.—Banerji Santan's Jotejanaki coal mine.

This unfortunate accident, by which thirteen women who were loading dust coal lost their lives, occurred owing to the water of a nala, near the mine, rising above the level of the inclines, completely filling the mine and drowning the deceased. There were three of these inclines and a shaft, but the top of the shaft was above the level of the flood.

The accident was made the subject of an inquiry under section 18 of the Indian Mines Act, and it was ascertained from reliable witnesses that although at sunset this nala was nearly dry and although at 8 A.M. next morning the flood was rapidly receding, yet, at 1 A.M. the water had reached a height unprecedented in the neighbourhood. A few miles away two railway bridges were washed away and in the case of one of them a passenger train was wrecked. At a bungalow near the mine, which was built in 1906, there were at 3-30 A.M. 2 feet of water in the rooms. It is known that the site had not been flooded for twenty years, and from inquiry apparently not for over forty years.

About four years previous to the accident a tramway bridge was built over the nala, a little downstream from the mine, and there is no doubt that owing to this bridge and the embankments approaching it the water was pounded back and prevented from flowing away freely. Moreover a little way upstream at another mine, on the opposite bank of the river, there is a winding engine, the foundations of which are close to the nala, and in flood time, owing to a bend in the nala, the water would be deflected from the foundations towards the inclines.

The management professed absolute ignorance of the fact that the thirteen women were underground that night. The staff consisted of an agent, who resided in Calcutta, and a manager, who holds a second class certificate of service, while the subordinate officials for that night were one mining overman (Bengali Sarkar) and one sirdar (Moti Bauri). A practice prevails in the neighbourhood of Raniganj of mining officials, winding engineman and banksmen working twenty-four hour shifts, that is to say, they work twenty-four hours and rest twenty-four hours. That these hours should be worked by ordinary miners is a matter to be deprecated on the ground of safety, and many managers would like to see the practice discontinued, if the obligation to do so were universal, but in the case of men who are responsible for the lives of others there can be no question as to the undesirability of them working for twenty-four hours. Fortunately the practice is confined to this particular locality.

Bengali Sarkar, the overman, stated that on the night of the accident he went home after having worked all day and having gone underground with the sirdar at 9 P.M., when they found no one in the mine. He went home because he knew that he would have to work on the following day, owing to the fact that the other overman was away on leave.

Moti Bauri, the sirdar, stated that at about 8 P.M., he told the manager that all the day miners had left work. At 9 P.M. he went round the mine with the overman and found no one at work. He then went to sleep at the top of the shaft.

Seeing that persons working on the night shift almost invariably go to work about sunset, the above timings must be regarded with grave suspicion. As at most small mines, night work is not carried on every night, and in this case it is extremely improbable that any inspection of the mine was made after work ceased for the day, which would probably be late in the afternoon.

Heavy rain did not commence till 10 P.M., and the manager was justified in retiring for the night, thinking that there was no danger. There was no reason why the overman should not have gone away for the night, as he had to work next day, and as he left the sirdar in charge. The latter being in charge, should certainly have been more vigilant. There is no doubt that the danger was not realised by anyone on the colliery and that every one concerned went to sleep, to wake only when the water was passing into the mine.

With the object of rescuing possible survivors in the rise workings, more promptitude might have been shown in pumping out the water, but, as a matter of fact, from the position of the bodies when recovered and the *post-mortem* evidence it is quite certain that no lives could have been saved, however quickly the water had been pumped out.

No. 94. — The Indian Collieries Syndicate, Limited's Jamadoba coal mine.

This accident, which is illustrated by plan D, was due to the flooding of the No. 2 shaft upper main level (A B on plan), in which seven miners, who were working there on the 7th of August, were cut off from escape during the night of the 7-8th and drowned.

On the morning of the 7th, there was very heavy rain, and no ordinary coal getting or coal raising was carried on. The manager went underground and saw the deceased miners near the mouth of the level, which they were driving forward. He told them there was no need for them to work that day as they would get no tubs. They nevertheless did go to work. They were paid a rate per lineal foot for driving the level and, as the next day was measuring day, they wanted to cut as much as possible.

Throughout the day, owing to water coming down the shafts and inclines, and also probably to percolation from the surface through goaves and workings, driven so near the surface as to leave very little cover, the water at the bottom of No. 2 shaft was rising.

The manager came to the surface at midday and during the afternoon he again went underground in order to get some machinery moved above water level, to prevent it being drowned out. This operation took him, and the gang of men assisting him, till 10 P.M., when, just before leaving the mine, he noticed the level of the water at the pump near the bottom of No. 2 shaft. From levellings which were made, after the water was pumped out, it has been found that when the water was at the level noticed by the manager it was within 2' 6" of the roof at the mouth (A on plan) of the level in which the seven deceased men were working. Their retreat therefore at that hour was on the point of being cut off, and must have been cut off shortly afterwards.

It afterwards transpired that another gang had been working in the companion gallery (C D on plan), which is at a lower level. From the evidence of these men, who left the mine early in the evening, it appears that they came up to the upper level—the mouth of their own level was probably cut off by the rising water — and asked the deceased if they were coming out. The latter replied that they still wanted to cut a few more feet. The evidence is not clear as to whether the deceased at this stage were cognisant of the height of the water at the mouth of their gallery. At any rate they continued to work on.

The evidence of the other gang goes to show that about 4 P.M., a sirdar, named Pooran Meah, visited these galleries. He was one of the head sirdars, and without any doubt was in charge of these men and responsible for their safety. It was stated that he made no remark to any of them at the time of his inspection.

The following morning it was found that the water from a nala on the surface at the extreme rise of the workings 2,600 feet from No. 2 shaft had broken into a gallery which had been driven up within a few feet of the bed of the nala and had filled the mine to a point 1,048 feet from the shaft, thus completely flooding the deceased's gallery. It is therefore a question of whether they could have been saved if the nala had not broken in. It is possible that they could have been. They were missed early on the morning of the 8th and it is just possible that the water would not by then have risen to the face of the gallery, and that by the introduction of auxiliary pumps they could have been rescued. Once the nala broke in the case was hopeless. It was weeks before the water could be pumped out sufficiently for the bodies to be recovered.

The accident was made the subject of an inquiry, which was ordered by the Local Government, under Section 18 of the Indian Mines Act.

In my opinion the sirdar Pooran Meah was to blame in not getting out these men in the afternoon.

As detailed in section IV, the manager and the sirdar were prosecuted for neglect to withdraw the workmen from a dangerous part of the mine.

Since the accident the workings into which the water of the flooded nala flowed have been completely shut off from the dip workings by masonry dams.

No. 95.—Bengal Bhatdih Coal Company's Bhatdih coal mine.

This accident which is illustrated by plan E and section F was due to the flooding of the river Damuda which, at sometime during the night of the 7th-8th of August, rose to such a height that the water reached the level of the colliery inclines, 19 in number, which were situated on the bank of the river at an average elevation of 25 feet above its bed. Continuing to rise it eventually reached a height of 14 feet above the level of the lowest incline, and the water poured in to the mine through some of the inclines and completely filled it. The only other exits from the mine were the two shafts, Nos. 1 and 2, situated to the dip. These shafts, which were 270 feet deep, were filled to a height of 180 feet from the bottom.

The flood was an extraordinary one. All rivers in the neighbourhood were in high flood, many mines in both the Jharia and Raniganj coal-fields were drowned out at the same time, and further downstream, near Burdwan, an embankment, which I understand has stood for forty years, was breached and a very large tract of country was flooded. Between the 4th and 7th of August, twenty-five inches of rain were registered at a rain gauge kept at a mine about two miles from Bhatdih.

There had been previous high floods, and the mouths of seven of the inclines had been protected by stone masonry embankments, ranging from 5 feet to 9 feet high, whilst in addition at Nos. 21, 22 and 23 inclines the openings had been dammed off by means of brick walls 5 feet thick and by stowing with rubbish. Some of the other inclines had also been stowed up more or less completely, but seven were open except for masonry embankments protecting three of them.

On the afternoon of the 7th of August the river was rising, and when night came on the manager sent two men to watch the level of the water. Later on these men reported to the manager that the water was at such a height as to allow it to rise another eleven feet before it could enter the mine. The manager then went to bed, having sent the two men back to the river with orders to watch and again report if the water rose another 2½ feet. Some time in the night the men working in the mine found that the water was rushing into it. Some escaped at once and the sirdar went up to fetch the manager who at once descended No. 1 shaft. The manager sent the sirdar to get out all the men on the west side, while he attempted to go east, but could make little headway owing to the current. The sirdar succeeded in getting to the four men who were working on the west side and bringing them back to the shaft. Meanwhile the manager had lost the light in his safety lamp. He ascended the shaft with the sirdar and the four rescued men, in order to procure another light, but, by the time he had got to the bottom of the pit again, the water had completely filled the shaft levels:

Besides the sirdar there were 18 persons in the mine that night. Of these six ascended the shaft at the first alarm, and four, working on the west side, were rescued by the sirdar, as stated. The remaining eight were working on the east side from whence some others had escaped. By the time, however, that these reached the gallery leading down to No. 2 shaft they found the rush of water so great that they could not cross the gallery. One attempted and was promptly carried off his feet and swept down into the shaft, where he caught hold of a guide rope, by which he eventually climbed to the surface. His escape was marvellous. The other seven were probably drowned in a very short time. Their bodies were recovered on the 29th September.

The accident was made the subject of an inquiry under section 18 of the

Indian Mines Act. It is practically certain that the men sent to watch the river went to sleep, probably in one of the inclines. It is not likely that the underground sirdar and those at the shaft bottom were any more on the alert. As detailed in section IV of this report, prosecutions were instituted against the manager and against the sirdar sent to watch the river for neglect to withdraw the workmen from a dangerous part of the mine.

To provide against a similar accident in the future no persons will be permitted to work underground in the inclines at night during the monsoon season, and if at any time a flood in the river rises to a certain fixed point, well below the mouths of the inclines, all persons will be withdrawn from the workings. Strong masonry dams have already been erected in the two openings through the coal barrier between the workings from the inclines and those from the shafts.

HAULAGE.

No. 102.—Titilmuri Collieries, Limited's Titilmuri coal mine.

A train of empty tubs was being lowered into the mine. Previous to lowering, while the train was still on the level, the engine driver tightened the rope to see if all the couplings were in order. He then slackened the rope and the tubs were pushed by the tubmen over the brow, the catch points having previously been set to the incline. Owing to the rope being very slack there was a jerk when the rope took the weight and a coupling broke, allowing seven tubs to run wild down the incline, running over a man, who was asleep underground, and killing him. An examination of the broken coupling showed that the fracture had occurred at the weld, and that the weld was a very imperfect one.

The accident would not have occurred if the catch points had been set to the catch siding and not to the incline. It is no use providing catch points or switches unless the workmen who have to actuate them are taught that until the whole train is on the slope and the rope and couplings have taken the weight, the catch points or switches must not be set to allow the train to travel into the incline.

No. 103.—Lakorka Coal Company, Limited's Lakorka coal mine.

A set of twelve empty tubs was being pushed over the brow of an incline on to the slope, in order to be let down into the mine, when, owing to a coupling not having been attached, seven tubs ran wild, killing a man, who was evidently asleep, underground. In this case the points of the catch siding were not sufficiently far down the slope to allow a full set of tubs to be on the slope above them. In consequence the catch points had to be set to the incline before it could be ascertained that the rope and couplings were in order or not. Such points should be a little further down the slope from the brow than the length of a full set of tubs.

Section IV.—Prosecutions and additions to the Act.

PROSECUTIONS.

Judgment was given in the following prosecutions during the year.

The following cases were instituted for breaches of rules made under section 20 of the Indian Mines Act by Notification No. 864-68—20, dated 10th March 1904.

A prosecution was initiated under section 22(1) (e) and section 22(3) (e) read with rule 24 against the agent and manager of the Bhalgora Coal Company, Limited's Simlabahal colliery for failing to secure the sides of a sinking shaft. The case arose out of an accident, No. 82 on the list, by which one man was killed and another was injured by a fall of stone. An inspection of the shaft by the Inspector holding the inquiry into the accident revealed the existence of an unsound piece of side which was not secured. The manager pleaded not guilty and said that he had taken all reasonable precautions by appointing a

sirdar to inspect the shaft daily, and that this sirdar had not reported any defect to him. The Court held that there was not sufficient evidence to prove that the stone which caused the accident fell from the bad ground, and hence that the evidence was insufficient to convict under section 22(1) (e), but held that the sirdar appointed was incompetent and hence that the manager was liable and convicted him under section 22(3) (e) and fined him Rs. 50, or in default three weeks' simple imprisonment. The case against the agent was withdrawn.

The manager of S. B. Chatterji's Basumata colliery was prosecuted under section 22(3) (e) read with rule 1 for working the mine without a second outlet more than two years after the opening of the mine. Work other than that required for making a second outlet had been done. Accused was found guilty and fined Rs. 100, or one month's simple imprisonment.

The owners (3) and manager of the West Ghusik Coal Company's West Ghusik colliery were prosecuted under section 22(1) (e) read with rule 2(e) and section 22(3) (e) read with rules 2(b) and 19. The case arose out of a fatal accident on October 26th, 1912, by which three people were thrown out of a bucket in a winding shaft and killed. There were no guides in the shaft as required by rule 2(e). Further offences against rule 2(b), there being no indicator on the winding engine, and rule 19, the top of the shaft not being adequately fenced, were disclosed on October 28th, the date on which the inquiry into the accident was made. Accused were convicted under section 22(1) (e) and were fined Rs. 25 each, or in default three weeks' rigorous imprisonment.

The owner of K. D. Singh and Company's Kalipahari colliery was prosecuted under section 22(3)(e) read with rules 2(b) 2(e) and 19 for failing to provide an indicator to the winding engine [rule 2(b), guides in the shaft (rule 2(e)) or to adequately fence the top of the shaft (rule 19)]. Accused had been previously warned more than once. He pleaded guilty and was fined Rs. 10, or in default fifteen days' rigorous imprisonment.

Proceedings were instituted against Kristo Jiban Chakravarty, owner of Mosila colliery under section 22(2) (b) read with rule 12 and under section 22(3) (e) read with rule 19 and also with rule 2 of Notification No. 11793-103, dated December 30th, 1908, for failure to submit plans of his abandoned mine, for not securely fencing the top of his abandoned pit and for not submitting notice of closing to the Chief Inspector of Mines in accordance with the above rules. As, however, accused was reported to be deceased the proceedings were dropped.

The following cases were instituted for breaches of rules made under Section 20 of the Indian Mines Act by Notification No. 11793-103, dated 30th December 1908.

The agent of the Serampur Coal Company, Limited's Serampur colliery was prosecuted under section 22 (2) (b) read with rule 1 for failing to submit annual return figures for his colliery for 1912. As it was proved that he did not become agent of the colliery till March 10th he was acquitted.

The owners (3) of the West Birsingpur Coal Company's Birsingpur colliery were prosecuted under section 22 (2) (b) read with rule 1 for failing to submit annual return figures for their colliery for 1912, and under section 22 (3) (e) read with rule 2 of the same notification for failing to submit notice of the closing of their mine. They were convicted and two of them were fined Rs. 50, or in default one month's simple imprisonment, and the third was fined Rs. 30, or in default three weeks' simple imprisonment.

The owner of Kendwa and Karma mica mines, the owner of Jorasimar and Harrayapaprawa mica mines and the owner of Murlipahari and Samseria mica mines, all situated in the Giridih sub-division of the Hazaribagh district of the province of Bihar and Orissa, were prosecuted under section 22 (2) (b) read with rule 1 for failing to submit annual return figures for their mines for 1912. The Court held, however, that as the complaint was not laid till August 28th, and the final date of offence was February 1st, the suit was barred by section 24 of the Indian Mines Act, and all the accused were acquitted.

On a similar count the owner of Ukharia Samtha mica mine in the Hazari-bagh district was prosecuted. He pleaded guilty and was fined Rs. 10, or in default two days' simple imprisonment.

On the same count the late owner of the Bamundiha Coal Concern's Chhatapathar colliery was prosecuted. Accused pleaded guilty, but said that he had been unable to submit the return owing to the records not being in his possession, as, following a decree of the Calcutta High Court by which he was dispossessed of the colliery, he was forcibly evicted from the colliery by the present owners, and all the records and books seized. He was fined Rs. 25, or in default one month's rigorous imprisonment.

The owner of Gararia colliery was prosecuted under section 22 (3) (e) read with rules 5, 6 and 7 for working within 50 yards of the land acquired for the East Indian Railway without giving previous notice of his intention to do so or submitting plans as required. His attention had been drawn to the point previously in 1909 when he was warned. He was now convicted and fined Rs. 100, or in default two months' simple imprisonment.

The owner and manager of the Ghusik Coal Company's Ghusik colliery were prosecuted on a similar count. They were each fined Rs. 50.

The following cases were instituted for breaches of rules made under Section 20 of the Indian Mines Act by Notification No. 6436—152, dated 2nd September 1911.

Arising out of a fatal accident, No. 35 in the list, at Seth Ramchand's Tikaria limestone mine, in the Murwara tahsil of the Jabalpur district, by which a woman was killed by a fall of side, the inquiry into the accident revealed the violation of rule 3 in that there was no written report of the daily inspection made on the day of the accident and in fact no daily report book was kept. Proceedings were instituted under section 22 (3) (e) read with rule 3 against the person who was put down in the annual return as manager, but as there was some doubt as to who actually was manager at the time of the accident, owing to frequent changes, the proceedings were dropped. Proceedings, however, were instituted against the owner under section 22 (3) (e) read with rule 1 for failing to give notice of the change of manager on three separate occasions. Accused pleaded not guilty, but was convicted and fined Rs. 15 on each count, or Rs. 45 in all.

The following case was instituted under the Indian Penal Code.

Arising out of a serious accident, at the Papathi Amman mica mine in the Salem district, a coolie named Vengam was prosecuted under section 336 for committing a rash and negligent act by drilling into a misfired shot hole. He was convicted and sentenced to two months' rigorous imprisonment.

Section V.—General Remarks.

HEALTH AND SANITATION.

During the year 214 deaths from cholera were reported to have taken place in the Jharia coalfield, and 28 deaths in the Raniganj coalfield. No deaths from plague or smallpox are known to have occurred in the same areas.

The Jharia Sanitation Committee held formal meetings on 15th July, 25th September, and 16th December. Informal meetings were held on 17th and 28th April when means of combating an epidemic of cholera were discussed. A meeting of colliery officials took place on 5th May when proposals for dealing with the epidemic were considered. The Honorary Secretary of the Committee reports that the first cases of cholera appear to have occurred in March at an Indian owned colliery at Tetturia. Other cases occurred very shortly afterwards at a large number of collieries on the Sijua side of the coalfield and at certain collieries on the Jharia side. The epidemic had subsided

considerably by the month of April, but in June an alarming outbreak took place at the Standard Coal Company's collieries in Jharia where there was a heavy death-roll. The disease then spread to other collieries in the same neighbourhood. As the virulence of the epidemic waned in September a few cases occurred in the Jharia Bazar. As a preventive measure against plague rat killing operations were resumed in the Jharia Bazar and at a number of collieries at the beginning of the cold season.

During the year rules under section 11 of the Bengal Mining Settlement Act were published. A copy of the rules will be found in Appendix IV, Statement No. 7. Steps are being taken to appoint a Mines Board of Health for the Jharia coalfield.

The Act for the provision of a pure water supply for the Jharia coalfield has been drafted, and it is to be hoped that the construction of the reservoir near Topchanchi will not be long delayed.

Towards the end of the year there was an epidemic of smallpox at Mohpani coal mine in the Central Provinces. Altogether there were 76 cases and 10 deaths. The mine superintendent remarks that the lesson to be learnt from the epidemic is the great importance of systematic re-vaccination of adults.

The total rainfall at Jealgora in the Jharia coalfield was 71.51 inches, or 26.82 inches in excess of that for the previous year. In the Giridih coalfield it was 61.85 inches, and in the Raniganj coalfield 78.39 inches, or more than double the fall recorded in 1912.

AMBULANCE WORK.

I regret to report that owing to the absence of the honorary secretary of the Central Committee on a year's leave the progress made in ambulance work has not been equal to that of former years. Many colliery managers, however, have interested themselves in the instruction of their subordinate staff and much valuable training was effected, but the lectures did not result in examinations being held.

The annual appeal to the colliery companies for subscriptions has met with a generous response, the sum of Rs. 1,005 being received. I have pleasure in appending a list of the subscribers to the fund:—

The Raja of Jharia, Messrs. F. W. Heilgers & Co., H. V. Low & Co., Apcar & Co., Macneill & Co., Martin & Co., Mackinnon, Mackenzie & Co., Shaw, Wallace & Co., Kilburn & Co., Bird & Co., Anderson, Wright & Co., Babu J. R. Agarwalla's Fatehpur colliery, Pandeybera Colliery Co., Bansdeopur Coal Co., Mr. Khora Ramji's Bulliari coal mines and Babu Bhola Nath Chatterji's Haripur colliery.

Now that the general body of managers and assistants has been trained in "first aid" the Central Committee have decided to extend instruction to deputy overmen, sirdars, fitters and peons at recognised centres. On the return of the honorary secretary in November a network of centres covering the Jharia, Raniganj and Giridih coalfields was organised in such a manner as to bring the classes within easy reach of the staff of nearly every colliery. Twenty-one colliery agents and managers promised the use of their doctors as lecturers and also accommodation for the members of the classes. There are 202 students attending the classes and their numbers will be largely augmented in the immediate future.

The first examination of this class of students was held at Jamadobā colliery under the direction of Mr. T. Adamson and Dr. Frank T. Simpson, and the success which attended it has established the fact that the more intelligent of the working classes are capable of acquiring the practical training necessary to stop bleeding, apply splints and bandages, restore the apparently drowned and carry the injured. Out of 27 candidates who sat for the examination 24 obtained junior certificates and large metal badges bearing the device of the St. John Ambulance Association. This result is most encouraging, for it has disclosed the fact that there are competent men in the coalfields who can give the working classes instruction in their own language.

SIBPUR COLLEGE MINING DEPARTMENT.

Mr. E. H. Robertson, the Professor of Mining at Sibpur College, Calcutta, has reported that of the four students studying the second year's course in mining, two were successful in gaining their diplomas at the examination held in March 1913, while of the twelve students who began studying course I, six sat for examination, and five qualified for promotion to course II.

It may be interesting to record that the special student who was mentioned last year as being the only one left of four who joined the college without scholarships, the other three having been compelled to relinquish their studies owing to pecuniary difficulties, is acquitting himself well. He carried off the III year prize for mining in 1913, and has on two occasions gained the McCale prize given for the best notebook compiled during the annual mining camp. It is to be hoped that the abandoned "special scholarships" will be renewed, so as to give an opportunity to those who can take advantage of it, as this student has done, but who have not the pecuniary means to take out a whole-time course of technical education.

The annual mining camp was pitched at Kustore during the months of November and December, and the site was particularly well chosen as many interesting operations were being carried on and there was a great deal of machinery and boiler plant in process of erection in the immediate vicinity. The students took notes of the new power plant added at Khoira, the electric sinking pump at Kendwadih, the underground "longwall" workings and the aerial ropeway at Loyabad, boiler erection at Alkusa, heavy feeders at Kustore, the erection of headgears, boilers and surface machinery at South Bulliari, the installation of reversible ventilating machinery at Bulliari, and the de-watering of Kusunda Nayadee. Surveys were carried out in the Alkusa mine of the Raniganj Coal Association, Ltd.

MINING EDUCATION IN THE BENGAL AND BIHAR COALFIELDS.

One meeting of the Mining Educational Advisory Board was held during the year.

Lecturers for the session 1913-14 were appointed as follows :—

Jharia Centre, Mr. L. A. Jacobs, B.Sc.; Sijua Centre, Mr. B. Starksfield, Charanpur Centre, Mr. H. C. Read, B.Sc.; Dishargarh Centre, Mr. C. E. Ashcroft; Raniganj Centre, Mr. H. C. Read, B.Sc.

A new centre at Raniganj was opened early in the year.

The lecturers for the sessions 1911-12 report that there were 360 names on the registers. This is an increase of 38 per cent. on the numbers for the previous session. The average attendance at each lecture was 20 students.

One of the lecturers stimulated the interest of students by inviting them weekly to his bungalow to do home work. Another lecturer gave lectures on Elementary Mechanics one hour before the time for the Mining lecture. Such zeal is to be commended.

The sessional examinations were held simultaneously at the different centres on 3rd June 1913, the examiners being Professor E. H. Robertson, M.Sc., and Mr. C. J. E. David, B.A. Of the 83 eligible candidates, forty presented themselves for examination, and seventeen (9 Europeans and 8 Indians) succeeded in obtaining the number of marks necessary to qualify for a certificate. At the previous examination 25 presented themselves and 16 were successful. Student G. D. Knyvett obtained the highest marks.

The examiners reported as follows :—

"The standard attained by the students does not differ materially from that of the two previous years.

"The sketches shewn up by the candidates were still on the whole of a very poor order, and we consider that the results to be obtained by the constant study and daily practice of simple freehand sketching should be impressed upon the students. To engineers of all kinds as well as to mining engineers a facility in sketching parts of machines, or outlines of engineering operations is of the greatest value."

During the session the classes were inspected by Professor E. H. Robertson, and the following extract from his report may be quoted :—

“ The meagreness of the home work sent in is to be deplored, and I should like to see some method instituted by which the average student will be induced not to regard so slightly as heretofore his entering upon the course. The persuasive effect of forbidding him to sit for examination unless he gains a certain percentage during the session has largely failed. The proposed prizes may have more effect. But I am of opinion that the most steady effect would be gained by the institution of a small deposit of caution money, returnable if the student qualifies for and sits at the examination. Forfeited caution money might go to swell the prizes.

“ I am not convinced of the desirability of the distribution of lithographed sketches and diagrams to the students. They save the students a certain amount of trouble, but it is trouble which they should not be saved. On the other hand we cannot expect the lecturer to execute complicated drawings on the blackboard. My experience is that the best results are to be gained by the actual drawing on the blackboard of simpler details, while more complicated diagrams are placed in good positions on the walls for a considerable time both before and after the lecture.”

In the last annual report reference was made to a proposal for the removal of the Mining Department of Sibpur College, Calcutta, and its incorporation into a mining and technical institute at one of the coal mining centres. A comprehensive scheme has since been drawn out and submitted to Government. The proposed site for the building is at Dhanbaid, close to the Jharia coal-field.

MINING AND GEOLOGICAL INSTITUTE OF INDIA.

The total membership of the Institute at the end of the year, including subscribers, was 308. Four meetings were held during the year. In addition to the above meetings, several meetings of the Jharia and Raniganj coalfields branches have been held, at which discussions have taken place. A sub-committee has been appointed to investigate the question of subsidence in the Bengal coalfields. The Government prize for the best paper read during the year was awarded to Mr. E. S. Tarlton. Three prizes of the value of Rs. 100 each, consisting of books, have been offered by the Institute for the best paper on each of the following subjects :—

- (a) Laying out a pit bottom for an Indian colliery,
- (b) Housing and sanitation of mine labour in India, and
- (c) The application of the various systems of electric haulage to Indian mines.

The revision of the geological map of the Raniganj coalfield undertaken by a sub-committee of the members has been completed. The sheets, on scales of both 1"=1 mile and 4"=1 mile, are on sale at the office of the Institute, 12 Dalhousie Square, Calcutta.

BOARD OF EXAMINERS FOR COAL MINE MANAGERS' CERTIFICATES.

No change is to be reported among the non-official members of the Board. The Board therefore was the same as that of last year, *viz.*, Mr. G. F. Adams, Chief Inspector of Mines in India (ex-officio President), and Messrs. S. Heslop and R. J. Browne.

During the year seven meetings were held.

There were twelve applicants for first class Indian certificates of competency in lieu of British certificates, and they were all granted certificates.

One first class certificate of service was granted.

An examination for certificates of competency was held at Dhanbaid in the office of the Department of Mines on the 19th and 20th February 1913 at which thirty-one candidates sat for first class certificates and sixty-seven for

second class certificates. Competency certificates were granted to six first class and fifteen second class candidates.

The examiners were Messrs. T. Adamson, Glen George and R. R. Simpson (Official Examiner and Secretary).

MINING BOARDS IN BENGAL AND BIHAR.

The Bengal Mining Board held one meeting during the year when the draft rules under the Bengal Mining Settlements Act were considered.

The non-official members of the Board were Messrs. W. Graham and Glen George.

The Mining Board for Bihar and Orissa, constituted in 1912, held its first meeting during 1913. The subject under consideration was the draft rules under the Bengal Mining Settlements Act.

The non-official members were Messrs. T. H. Ward and R. G. M. Bathgate.

OFFICIAL DUTIES IN 1913.

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

Mr. R. R. Simpson was Inspector of Mines, No. 1 Circle. From the beginning of the year to the 19th March 1913 he had charge of a part of No. 2 Circle in addition to his own duties. He was granted privilege leave for three months combined with five months furlough from the 20th March 1913. He resumed charge of No. 1 Circle on the 24th November 1913.

Mr. G. C. Leach was Inspector of Mines, No. 2 Circle. He returned from combined leave on the 26th October 1913 and had charge of No. 1 Circle from the 26th October 1913 to the 23rd November 1913, resuming charge of No. 2 Circle on the 24th November 1913.

Mr. C. J. E. David was Inspector of Mines, No. 3 Circle. From the beginning of the year up to the 20th March 1913 he had charge of part of No. 2 Circle in addition to his own duties. From the 21st March 1913 to the 25th October 1913 he had charge of Nos. 1, 2 and 3 Circles and from the 26th October 1913 to 23rd November 1913 he had charge of No. 2 Circle in addition to his own duties.

Mr. J. J. Turnbull was appointed Junior Inspector of Mines and took up his duties as such from the 18th December 1913.

I have the honour to be,

SIR,

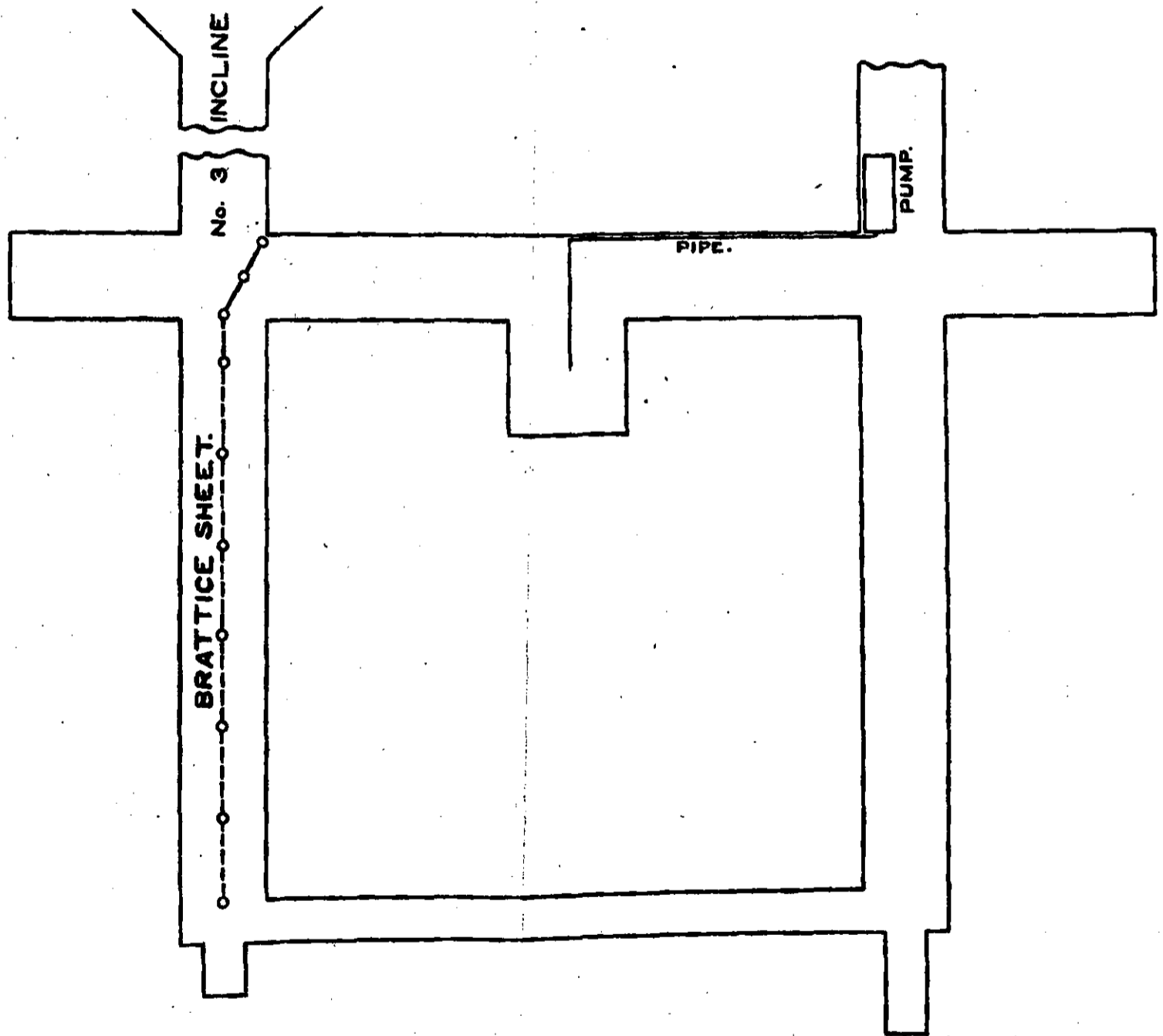
Your most obedient servant,

R. R. SIMPSON,

Offg. Chief Inspector of Mines in India.

PLAN ILLUSTRATING REPORT ON
FATAL ACCIDENT BY EXPLOSION OF FIREDAMP
AT
THE EQUITABLE COAL CO., L^{TD} CHOWRASI MINE
SCALE 1 INCH=20 FEET

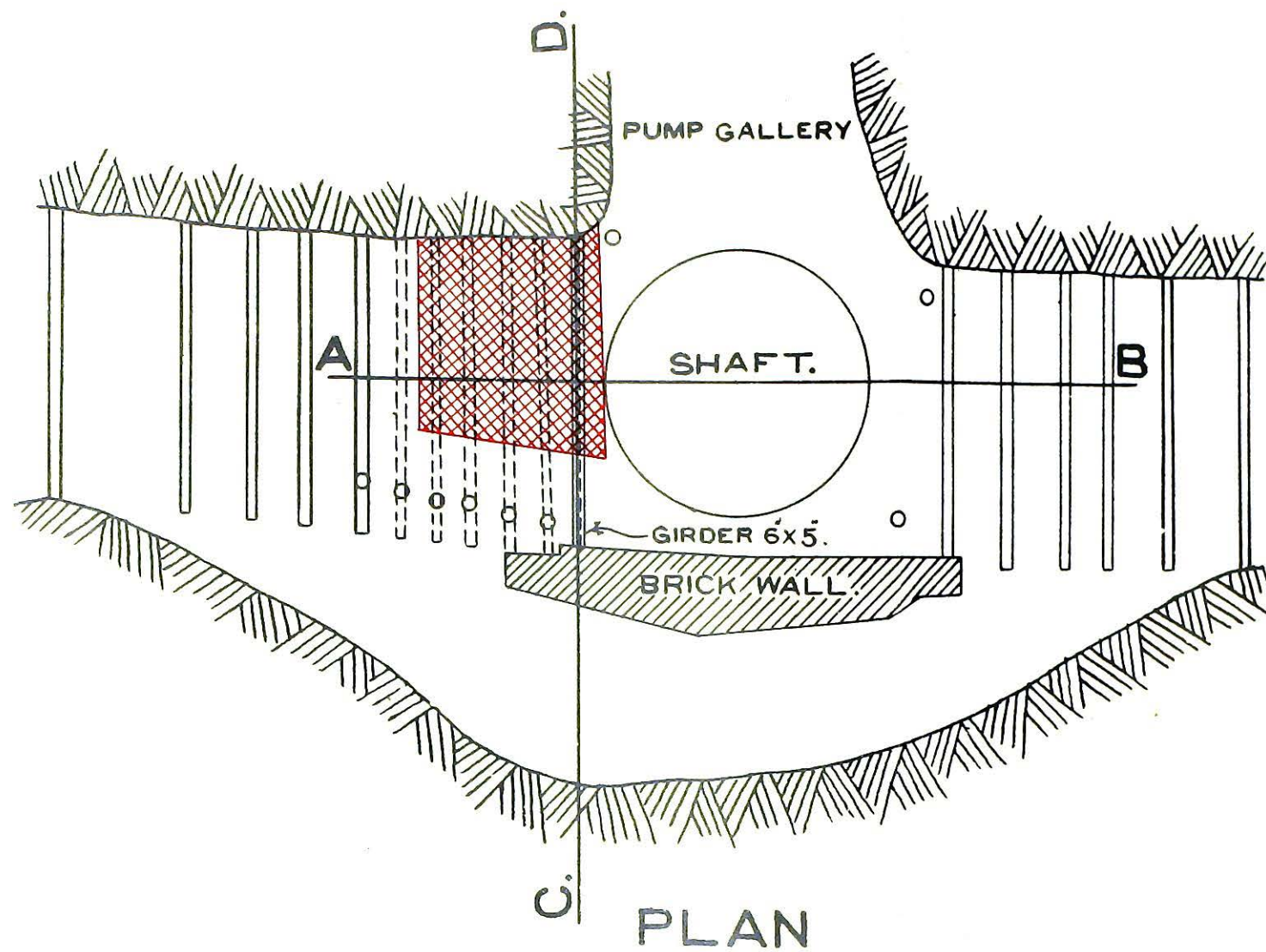
Plan showing position of brattice sheet at face of No. 3 Incline.



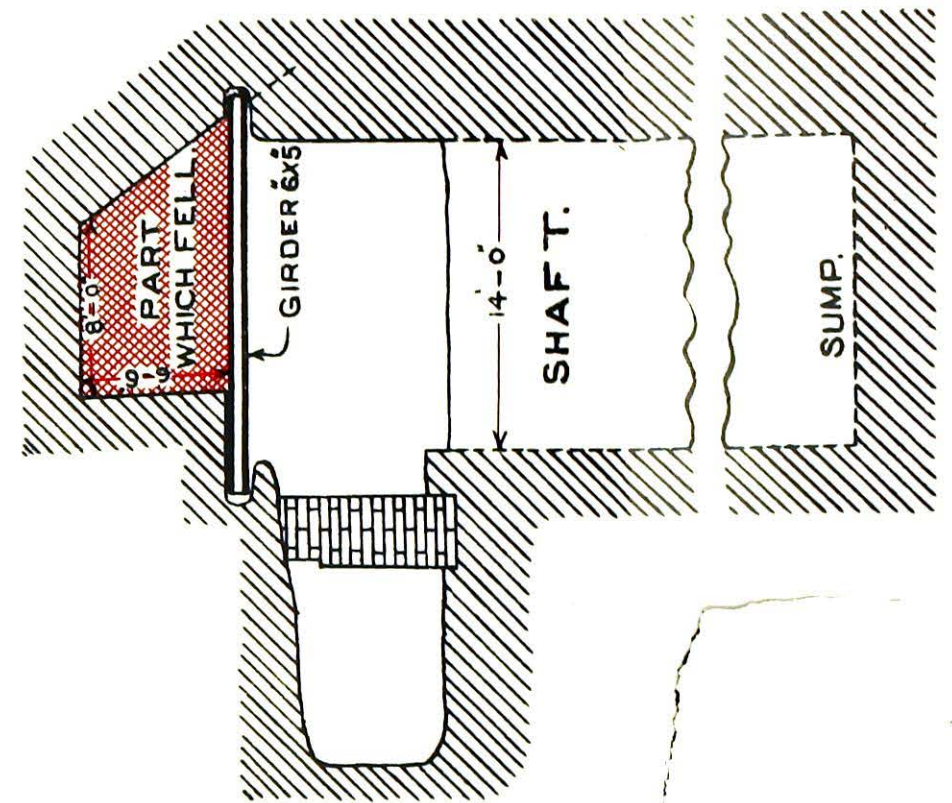
PLAN & SECTIONS ILLUSTRATING REPORT ON FATAL ACCIDENT BY FALL OF GROUND IN SHAFT AT

THE EASTERN COAL CO. L^{TD}'S BHOWRA MINE

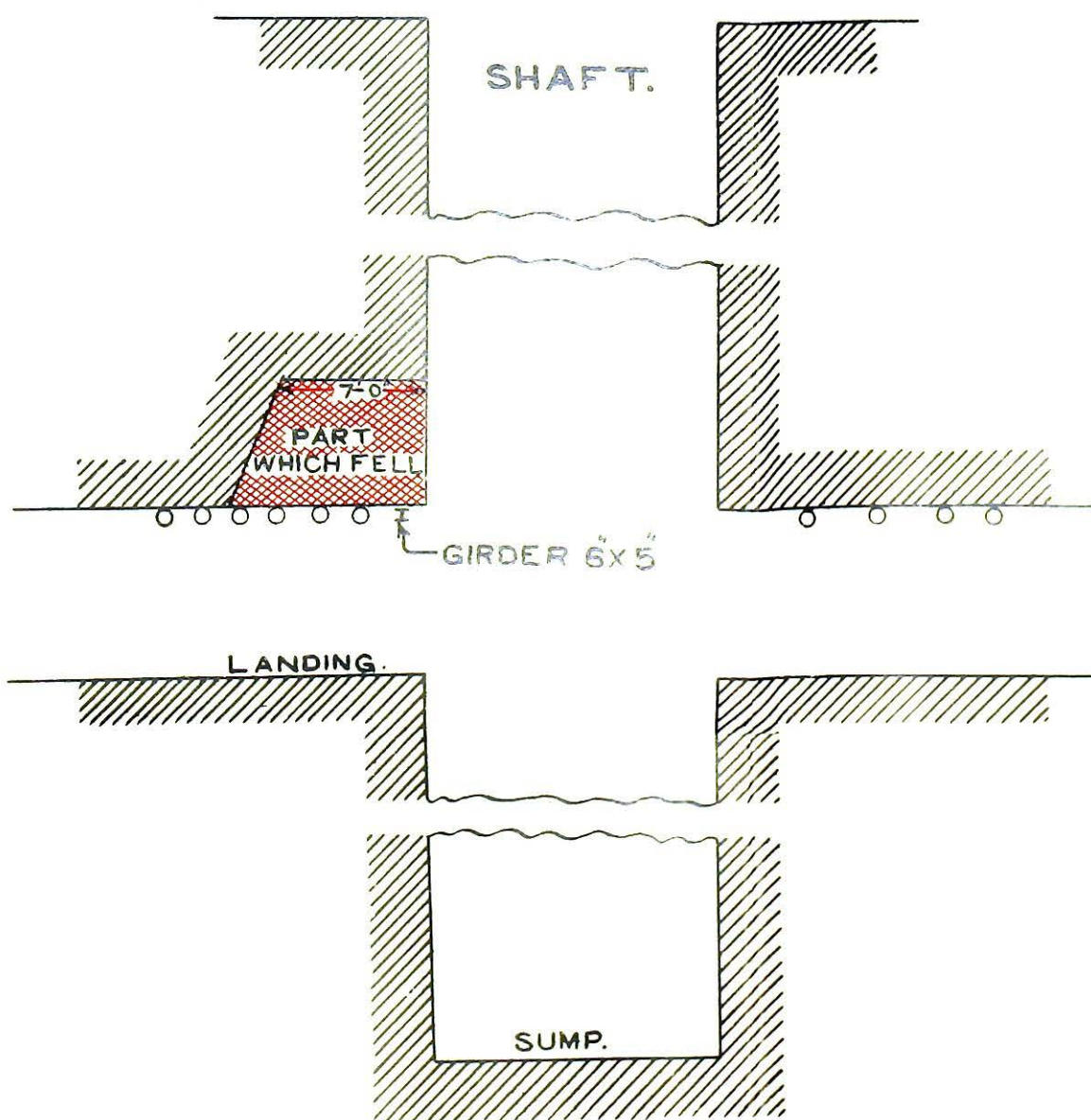
SCALE 1 INCH=10 FEET.



PLAN

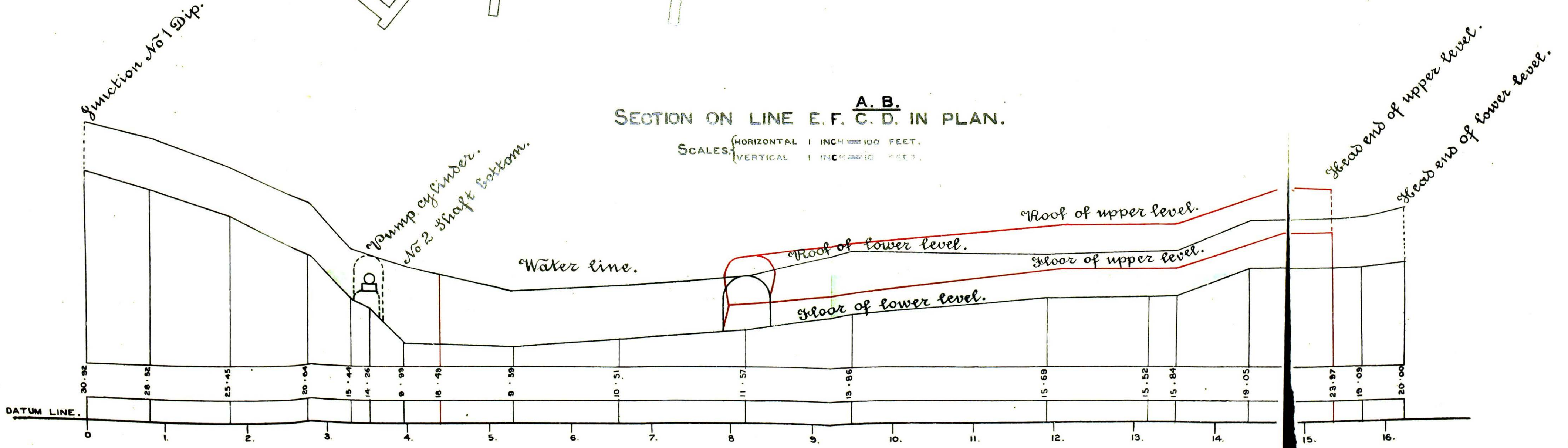
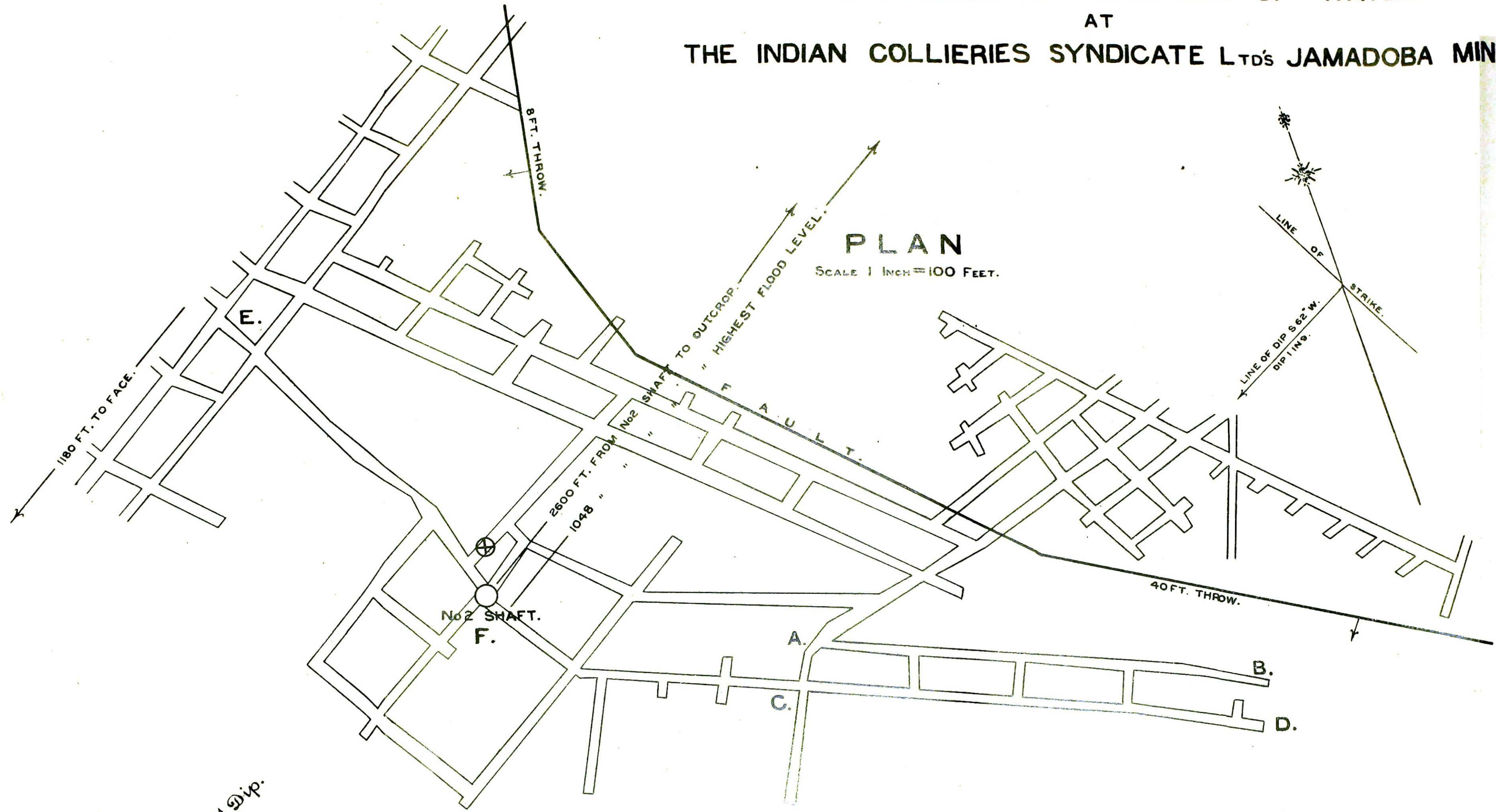


SECTION ON C.D.

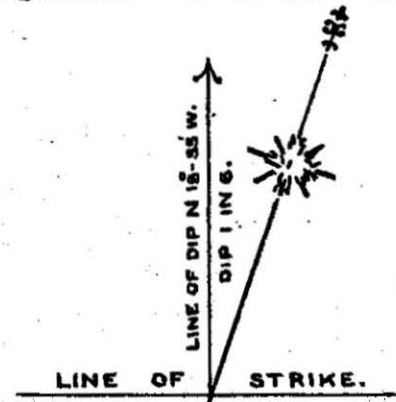


SECTION ON A.B.

PLAN AND SECTION ILLUSTRATING REPORT ON
 FATAL ACCIDENT BY IRRUPTION OF WATER
 AT
 THE INDIAN COLLIERIES SYNDICATE LTD'S JAMADOBA MINE

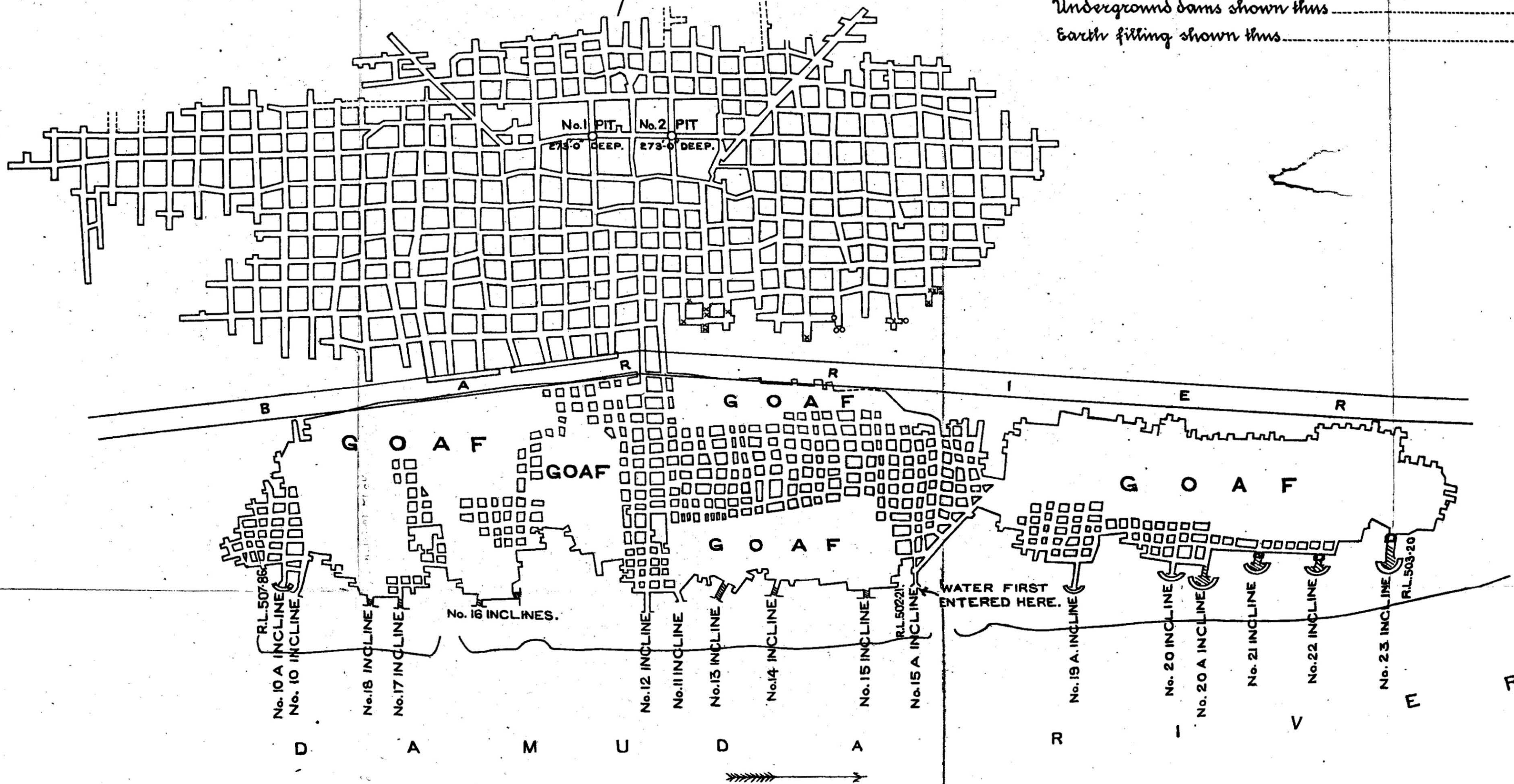


PLAN ILLUSTRATING REPORT ON
 FATAL ACCIDENT BY IRRUPTION OF WATER
 AT
 THE BENGAL BHATDIH COAL CO, LTD'S BHATDIH MINE
 SCALE 1 INCH=200 FEET.



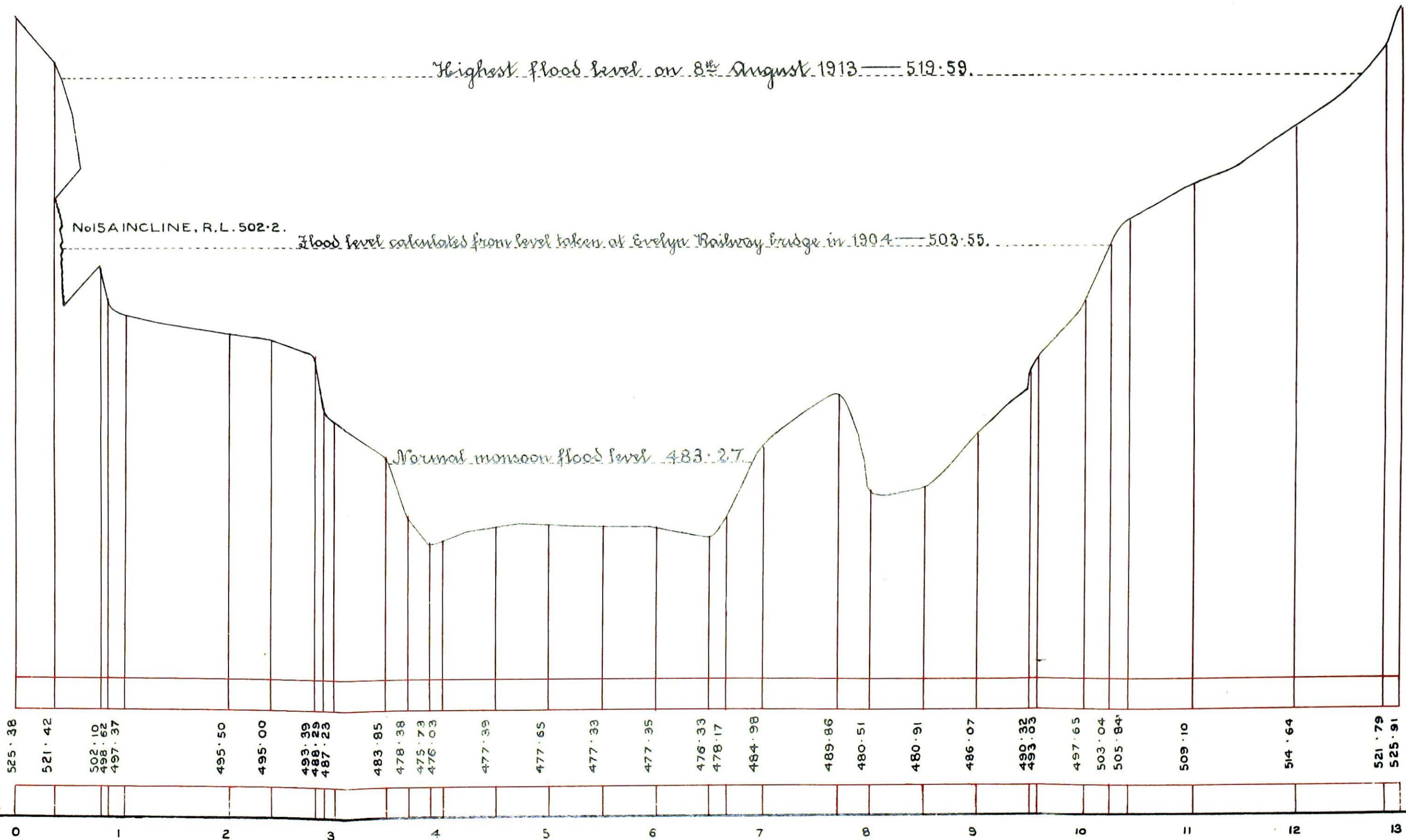
REFERENCES.

- Position of dead bodies shown thus X
- Working places of deceased shown thus X
- Working places of persons on East side who escaped shown thus O
- Masonry embankments shown thus C
- Underground dams shown thus D
- Earth filling shown thus H



SECTION ILLUSTRATING REPORT ON FATAL ACCIDENT BY IRRUPTION OF WATER AT THE BENGAL BHATDIH COAL Co LTD'S BHATDIH MINE

SCALES { HORIZONTAL 1 INCH = 100 FEET.
 { VERTICAL 1 INCH = 10 FEET.



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 1913.

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 13).	Total below ground.	Adult males.	Adult females.	Children (under 13).	Total above ground.		
Bihar and Orissa .	Hazaribagh {	Bokaro-Ranigarh	10	10	...	...	2,855	43	76	5	124	34	21	5	60	184	
		Giridih . . .	9	5	4	5	5	806,810	3,868	1,457	...	5,125	1,908	1,230	65	3,203	8,328
		Jharia . . .	6	...	6	...	...	2,087	78	24	4	101	36	37	2	75	176
	Manbhum {	Jharia . . .	251	132	119	89	173	8,606,223	24,439	19,684	291	44,414	17,163	8,279	1,888	26,830	71,244
		Raniganj . . .	83	8	75	38	63	674,864	2,772	1,346	18	4,136	1,181	720	51	1,952	6,088
	Sonthal Parganas. {	Raniganj . . .	2	...	2	2	2	2,532	12	9	...	21	2	3	...	5	28
		Rajmahal . . .	2	...	2	...	...	2,868	12	11	...	23	18	18	...	31	54
	Palamu, Daltonganj . . .	1	1	...	...	...	85,345	281	218	7	601	214	44	14	272	773	
	Sambalpur, Hingir-Rampur . . .	1	1	...	1	1	42,805	255	74	...	329	148	12	...	160	489	
		TOTAL	365	147	218	135	249	10,226,389	31,555	22,894	325	54,774	20,704	10,359	1,525	32,588	87,362
Bengal . . .	Bankura, Raniganj {	Bankura, Raniganj . . .	2	...	2	2	2	5,225	40	22	...	62	4	5	...	9	71
		Birbhum . . .	1	...	1	1	1	2,461	16	9	...	25	8	2	...	10	35
		Burdwan . . .	181	152	29	86	158	4,642,166	16,924	8,069	134	25,127	8,108	4,857	355	13,320	38,447
	TOTAL	184	152	32	89	161	4,649,852	16,980	8,100	134	25,214	8,120	4,864	355	13,339	38,553	

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 1913.

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.		
Central Provinces	Chhindwara, Pench Valley	5	4	1	2	3	89,805	391	199	24	614	126	72	20	218	832	
		Narsinghpur, Mohpani	1	1	...	1	2	64,887	513	247	...	760	369	49	...	418	1,178
		Chanda, Ballarpur	2	2	...	1	2	80,959	493	493	175	6	...	181	674
	TOTAL	8	7	1	4	7	235,651	1,397	446	24	1,867	670	127	20	817	2,684	
Punjab	Jhelum	6	...	6	5	5	46,155	584	...	1	585	243	...	18	261	846	
		Shahpur	2	...	2	...	...	4,885	12	...	...	12	34	...	34	46
	TOTAL	8	...	8	5	5	51,040	596	...	1	597	277	...	18	295	892	
Assam	Lakhimpur	10	7	3	...	...	270,364	1,441	217	...	1,658	517	236	47	800	2,458

Baluchistan	Bolan	1	...	1	...	...	990	12	...	...	12	4	...	...	4	16
	Kalat	1	...	1	...	...	5	10	...	...	10	...	...	...	4	10
	Quetta-Pishin	8	...	8	...	...	6,155	62	...	...	62	39	...	...	...	101
	Sibi-Khost	15	1	14	1	10	45,535	606	...	...	606	301	...	16	317	923
	Loralai	1	...	1	...	...	197	22	...	...	22	15	...	...	15	37
	TOTAL	26	1	25	1	10	52,932	712	...	...	712	359	...	16	375	1,087
North-West Frontier Province.	Hazara	1	...	1	...	...	90	6	...	...	6	...	...	...	...	6
	GRAND TOTAL (COAL) FOR 1913.	602	314	288	234	432	15,486,318	52,687	31,657	484	84,828	30,647	15,586	1,981	48,214	133,042	
	" " OF PRECEDING YEAR.	527	276	251	401	686	14,044,368	48,920	28,504	506	17,930	27,910	13,717	1,835	43,462	121,392	
	DIFFERENCE	+75	+38	+37	-167	-254	+1,441,950	+3,767	+3,153	-22	+6,898	+2,737	+1,869	+146	+4,752	+11,650	
							B.—MICA.										
							Cwts.										
Bihar and Orissa	Monghyr	18	...	18	...	...	1,411	181	130	...	311	50	63	23	136	447
	Hazaribagh	503	3	500	71	71	23,389	3,497	1,713	401	5,611	1,914	1,470	1,004	4,397	10,008	
	Gaya	30	...	30	4	4	6,424	765	322	35	1,122	201	259	345	705	1,327	
	Sonthal Parganas	1	...	1	...	...	15	16	8	...	24	...	...	8	8	88
	TOTAL	547	3	544	75	75	31,239	4,459	2,173	436	7,068	2,165	1,801	1,280	5,216	12,314	
Madras	Coimbatore	2	...	2	...	...	4	22	10	...	32	...	...	...	...	32
	Nellore	73	6	67	36	36	9,810	2,366	1,441	245	4,052	541	603	523	1,667	5,719	
	Salem	4	...	4	1	1	924	64	...	...	64	56	105	26	187	251
	TOTAL	79	6	73	37	37	10,738	2,452	1,451	245	4,148	597	708	549	1,854	6,002	

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 1913.

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 13).	Total below ground.	Adult males.	Adult females.	Children (under 13).	Total above ground.	
Rajputana	Ajmer	4	...	4	...	...	1,030	147	25	...	172	111	24	10	145	317
	Merwara	2	...	2	...	...	637	31	7	...	38	24	20	19	63	101
	TOTAL	6	...	6	...	..	1,673	178	32	...	210	135	44	29	208	418
	GRAND TOTAL (MICA) FOR 1913.	632	9	623	112	112	43,650	7,089	3,656	681	11,426	2,897	2,553	1,858	7,308	18,734
	" " OF PRECEDING YEAR.	473	9	464	7	7	41,660	6,206	3,656	554	10,416	2,262	2,471	1,872	6,605	17,021
	DIFFERENCE	+159	...	+159	+105	+105	+1,990	+883	...	+127	+1,010	+635	+82	-14	+703	+1,713
Central Provinces .	C.—MANGANESE.															
							Tons.									
	Nagpur	21	1	20	4	6	218,739	1,413	1,170	...	2,583	536	367	38	941	3,524
	Bhandara	12	...	12	1	1	57,934	489	400	10	899	177	148	56	381	1,280
	Balaghat	15	..	15	1	2	197,297	2,248	1,757	60	4,065	309	241	41	591	4,656
Chhindwara	2	1	1	1	1	78,330	365	291	2	658	45	11	...	66	714	
	TOTAL	50	2	48	7	10	553,360	4,515	3,618	72	8,205	1,067	767	135	1,969	10,174
Madras	Vizagapatam	8	2	6	3	3	44,127	1,345	829	58	2,232	199	128	20	357	2,589

Bombay	Panch Mahals	2	1	1	2	3	40,914	573	299	47	919	212	40	26	278	1,197
	GRAND TOTAL (MANGANESE) FOR 1913.	60	5	55	12	16	637,391	6,433	4,746	177	11,356	1,478	935	191	2,604	13,960
	" " OF PRECED- ING YEAR.	47	8	39	...	...	423,464	4,281	2,686	94	7,061	2,159	1,616	196	3,971	11,032
	DIFFERENCE	+13	-3	+16	+12	+16	+213,927	+2,152	+2,060	+83	+4,295	-681	-681	-5	-1,367	+2,928
	D.—LIMESTONE.															
	Tons.															
Central Provinces	Jabalpur, Katni	24	3	21	22	25	70,359	627	1,149	55	2,031	240	373	33	646	2,677
Panjab	Hoshiarpur	1	...	1	...	...	900	51	...	...	51	15	..	2	17	68
	GRAND TOTAL (LIMESTONE) FOR 1913.	25	3	22	22	25	71,259	678	1,149	55	2,082	255	373	35	663	2,745
	" " OF PRECED- ING YEAR.	21	1	20	...	...	61,784	742	762	63	1,567	446	631	44	1,121	2,688
	DIFFERENCE	+4	+2	+2	+22	+25	+20,525	+136	+387	-8	+515	-191	-258	-9	-458	+57
	E.—SALT.															
	Tons.															
Panjab	Shahpur	1	...	1	...	...	5,233	16	14	4	34	...	...	...	...	34
	Jhelum	2	...	2	1	6	123,944	391	344	56	791	49	...	...	49	840
	Mianwali	1	...	1	...	...	9,363	48	...	10	58	...	...	...	...	58
	GRAND TOTAL (SALT) FOR 1913.	4	...	4	1	6	138,540	455	358	70	883	49	...	...	49	932
	" " OF PRECED- ING YEAR.	4	...	4	2	4	131,233	481	365	74	920	50	...	...	50	970
	DIFFERENCE	...	...	...	-1	+2	+7,307	-26	-7	-4	-37	-1	...	...	-1	-38

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 1913.

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.		Carats.	769	...	...	769	1,046	...	...	1,046	1,815
	Mogok	9	1	8	(a) Rubies.												21,353
	Mogok	(b) Sapphires.												53,428
	TOTAL	9	1	8	(c) Spinels.		278,706	769	...	...	769	1,046	...	...	1,046	1,815
Madras	Kurnool	...	...	...	(d) Diamonds.		...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (GEMS) FOR 1913.	9	1	8	...		278,706	769	...	...	769	1,046	...	...	1,046	1,815
	" " OF PRECEDING YEAR.	9	...	9	...		323,247	776	5	...	781	938	...	...	938	1,719
	DIFFERENCE	...	+1	-1	...		-44,541	-7	-5	...	-12	+108	...	...	+108	+96

		G.—SLATE.														
							Tons.									
Bihar and Orissa	Monghyr	6	...	6	...	...	2,650	39	20	...	59	196	30	34	360	319
Panjab	Kangra	5	...	5	...	...	5,267	115	5	6	126	185	45	89	269	295
	Gurgaon	4	...	4	...	...	3,553	165	...	52	217	44	...	10	54	271
	TOTAL	9	...	9	...	...	8,820	280	5	58	343	229	45	49	323	666
	GRAND TOTAL (SLATE) FOR 1913.	15	...	15	...	...	11,470	319	25	58	402	425	75	83	583	985
	" " OF PRECEDING YEAR.	16	...	16	18	19	9,991	283	24	38	345	470	97	67	634	979
	DIFFERENCE	-1	...	-1	-13	-19	+1,479	+36	+1	+20	+57	-45	-22	+16	-51	+6
		H.—GOLD.														
							Ozs.									
Madras	Anantapur	3	3	...	3	6	11,019	499	...	...	499	962	211	111	1,284	1,783
	GRAND TOTAL (GOLD) FOR 1913.	3	3	...	3	6	11,019	499	...	...	499	962	211	111	1,284	1,783
	" " OF PRECEDING YEAR.	3	3	...	...	...	7,269	535	...	...	535	880	298	43	1,221	1,756
	DIFFERENCE	...	...	...	+3	+6	+3,750	-36	...	...	-36	+82	-87	+68	+63	+27
		I.—IRON.														
							Tons.									
	Singhbhum	2	...	2	1	1	97,527	450	185	70	705	173	320	96	589	1,294
	Jabalpur	1	...	1	...	...	844	25	47	20	92	...	5	4	9	101
	GRAND TOTAL (IRON) FOR 1913.	3	...	3	1	1	98,371	475	232	90	797	173	325	100	598	1,395
	" " OF PRECEDING YEAR.	2	...	2	1	4	79,383	775	504	129	1,408	56	45	31	132	1,540
	DIFFERENCE	+1	...	+1	...	-3	+18,988	-300	-272	-39	-611	+117	+280	+69	+466	-145

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 1913.

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.		
Burma	J.—WOLFRAM.																
							Cwts.										
	Tavoy	34	...	34	17	20	27,427	1,853	24	5	1,382	840	110	36	986	2,388	
	Mergui	1	...	1	1	1	93	88	...	...	88	75	...	...	75	163
	TOTAL	35	...	35	18	21	27,520	1,441	24	5	1,470	915	110	36	1,061	2,531	
	GRAND TOTAL (WOLFRAM) FOR 1913.	35	...	35	18	21	27,520	1,441	24	5	1,470	915	110	36	1,061	2,531	
	" " OF PRECEDING YEAR.	29	...	29	...	...	25,401	954	26	1	981	1,049	132	10	1,191	2,172
	DIFFERENCE	+6	...	+6	+18	+21	+2,119	+487	-2	+4	+489	-134	-22	+26	-130	+359	
Madras	K.—MAGNESITE.																
							Tons.										
	Salem	4	...	4	1	1	14,086	326	375	249	950	120	...	9	129	1,079	
	TOTAL OF PRECEDING YEAR	1	...	1	...	...	15,379	899	466	165	1,030	69	21	5	95	1,125
	DIFFERENCE	+3	...	+3	+1	+1	-1,293	-73	-91	+84	-80	+51	-21	+4	+34	-46	

		L.—CHROMITE.														
						Cwts.										
Baluchistan . . .	Quetta-Fishin	1	...	1	...	...	460	6	...	...	6	2	...	...	2	8
	Zhob	9	...	9	...	...	67,820	...	...	...	62	...	...	62	63	63
	GRAND TOTAL (CHROMITE) FOR 1913.	10	...	10	...	...	68,280	6	...	...	6	64	...	...	64	70
	TOTAL OF PRECEDING YEAR	2	...	2	...	...	120	5	...	...	5	4	...	...	4	9
DIFFERENCE . . .		+8	...	+8	...	...	+68,160	+1	...	...	+1	+60	...	...	+60	+61
Bihar and Orissa . . .	M.—COPPER ORE.															
	Singhbhum	1	1	...	1	5	Tons. 3,639	408	...	...	408	560	182	65	807	1,215
	TOTAL OF PRECEDING YEAR	1	1	...	1	2	8,984	593	...	...	593	380	172	45	597	1,190
DIFFERENCE . . .		...	...	...	...	+3	-5,345	-185	...	...	-185	+180	+10	+20	+210	+25
Central Provinces . . .	N.—FULLER'S EARTH.															
	Jabalpur	1	...	1	...	...	Tons. 103	...	...	...	...	...	...	...	...	...
	TOTAL OF PRECEDING YEAR	1	...	1	...	...	93	...	...	...	...	...	...	...	...	...
DIFFERENCE . . .		...	...	...	...	...	+5	...	...	...	...	...	...	...	...	...
Bihar and Orissa . . .	O.—CLAY.															
	Palamau	1	...	1	...	...	Tons. 55	5	...	...	5	4	...	...	4	9
Central Provinces . . .	Jabalpur	3	1	2	3	3	22,048	58	93	...	151	30	...	...	30	181
Delhi . . .	Delhi	1	...	1	1	1	962	65	...	...	65	65	...	...	65	130
Madras . . .	Nellore	1	...	1	...	...	...	5	5	...	10	...	...	...	...	10
GRAND TOTAL (CLAY) FOR 1913.		6	1	5	4	4	23,665	133	98	...	231	99	...	...	99	330
TOTAL OF PRECEDING YEAR		3	...	3	1	1	18,285	39	55	...	94	27	9	...	36	180
DIFFERENCE . . .		+3	+1	+2	+3	+3	+5,380	+94	+43	...	+137	+72	-9	...	+63	+200
Central Provinces . . .	P.—GALENA.															
Drug	1*	...	1	...	...	...	Cwts. 30	7	35	...	42	...	...	...	...	42

* Figures included with that for Central Provinces 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 1913.

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 13).	Total below ground.	Adult males.	Adult females.	Children (under 13).	Total above ground.		
Madras	Kurnool . . . . .	..	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (GALENA) FOR 1913.	1	...	1	...	..	30	7	35	...	42	...	...	...	...	...	42
	" " OF PRECEDING YEAR.	1	...	1	...	..	180	13	14	8	36	3	3	...	6	...	41
	DIFFERENCE . . . . .	...	..	...	...	..	-150	-6	+21	-8	+7	-3	-3	...	-6	...	+1
Bihar and Orissa	Hazaribagh	1	...	1	...	...	1	4	...	...	4	8	...	...	8	...	12
Burma	Mergui	1	...	1	1	1	419	...	...	...	...	...	...	...	...	...	...
	Tavoy	4	1	3	1	1	1,314	...	...	...	...	130	...	...	130	...	130
	TOTAL	5	1	4	2	2	1,733	...	...	...	...	130	...	...	130	...	130
	GRAND TOTAL (TIN) FOR 1913.	6	1	5	2	2	1,734	4	...	...	4	138	...	...	138	...	142
" " OF PRECEDING YEAR.	2	...	2	...	...	1,265	70	...	...	70	85	...	...	85	...	165	
DIFFERENCE	+4	+1	+3	+2	+2	+469	-66	...	...	-66	+53	...	...	+53	...	-13	

							R.—STREATITE.									
							Cwts.									
Central Provinces	Jabalpur	3	...	3	...	...	13,212	60	42	...	102	...	...	...	...	102
Madras	Kurnool	1	...	1	..	...	10,908	57	110	...	167	23	24	...	47	214
GRAND TOTAL (STREATITE) FOR 1913.		4	...	4	...	...	24,120	117	152	...	269	23	24	...	47	316
" " OF PRECEDING YEAR.		1	...	1	...	...	11,200	24	36	...	60	4	8	...	12	72
DIFFERENCE		+3	...	+3	...	...	+12,920	+93	+116	...	+209	+19	+16	...	+35	+244
							S.—GRAPHITE.									
							Cwts.									
Madras	Ramnad	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
TOTAL of preceding year		1	...	1	...	...	...	4	..	...	4	6	2	...	8	12
DIFFERENCE		-1	...	-1	...	..	...	-4	...	...	-4	-6	-2	...	-8	-12
							T.—CORUNDUM.									
							Cwts.									
Madras	Trichinopoly	4	...	4	...	...	1,650	28	39	8	70	21	41	12	74	144
TOTAL of preceding year		1	...	1	...	...	2,494	21	88	4	113	36	74	34	144	257
DIFFERENCE		+3	...	+3	...	...	-844	+7	-49	-1	-43	-15	-33	-22	-70	-113
							U.—SAMARSKITE.									
							Cwts.									
Madras	Nellore	1	...	1	...	...	3	...	...	...	...	...	...	...	...	...
TOTAL of preceding year		1	...	1	...	...	29	...	...	...	...	...	...	...	...	...
DIFFERENCE		...	...	...	...	...	-26	...	...	...	...	...	...	...	...	...

* Figures included with Burma (Mergui) Wolfram figures.
† Figures included with Madras (Nellore) Mica figures.

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 1913.

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 13).	Total below ground.	Adult males.	Adult females.	Children (under 13).	Total above ground.	
	GRAND TOTAL (ALL MINERALS.)	1,426	338	1,088	411	631	Tons. 16,484,842 Cwts. 166,987 Ounces. 11,019 Carats. 278,708	72,074	42,546	1,872	116,492	39,872	20,415	4,481	64,768	181,260
	GRAND TOTAL OF PRECEDING YEAR.	1,147	299	848	426	723	Tons. 14,823,919 Cwts. 82,329 Ounces. 7,269 Carats. 323,247	65,133	37,211	1,636	103,980	36,638	19,296	4,188	60,322	164,302
	DIFFERENCE	+279	+39	+240	-15	-92	Tons. +1,660,923 Cwts. +84,658 Ounces. +8,750 Carats. -44,541	+6,941	+5,335	+236	+12,512	+3,034	+1,119	+293	+4,446	+16,958

APPENDIX I—*contd.*

Table No. 2.
Number of mines opened and closed during the year ending 31st
December 1913.

Province.	District.	Number of mines opened.	Number of mine closed.	
A.—COAL.				
BIHAR AND ORISSA	Hazaribagh {	Jharis	4	3
		Bokaro-Ramgarh	5	3
		Giridih	3	2
	Manbhum {	Jharis	19	9
		Raniganj	14	7
	Sonthal Parganas, Rajmahal	1	1	
TOTAL		46	25	
BENGAL	Burdwan-Raniganj	16	12	
BALUCHISTAN	Sibi-Khost	8	8	
	Quetta-Pishin	1	...	
	Kalat . . . . .	...	1
TOTAL		9	9	
CENTRAL PROVINCES	Chanda	1	...	
	Chhindwara	1	...	
TOTAL		2	...	
ASSAM	Lakhimpur . . . . .	...	1
PANJAB	Jhelum	2	1	
TOTAL (COAL)		75	48	
B.—MICA.				
BIHAR AND ORISSA	Monghyr	3	3	
	Hazaribagh	199	163	
	Gaya	6	3	
	Sonthal Parganas	1	1	
TOTAL		209	170	
MADRAS	Coimbatore	1	...	
	Nellore	22	11	
	Salem	1	1	
TOTAL		24	12	

APPENDIX I—*contd.*Table No. 2—*contd.*

Number of mines opened and closed during the year ending 31st
December 1913—*contd.*

Province	District	Number of mines opened.	Number of mines closed
RAJPUTANA	Ajmer	1	1
	Merwara	1	...
	TOTAL	2	1
TOTAL (MICA)		235	183
CENTRAL PROVINCES	C.—MANGANESE.		
	Bhandara . . . . .	...	2
	Balaghat	4	2
	Nagpur	1	1
TOTAL		5	5
MADRAS	Vizagapatam . . . . .	...	8
TOTAL (MANGANESE)		5	8
CENTRAL PROVINCES	D.—LIMESTONE.		
	Jabalpur	5	7
PANJAB	Hoshiarpur	1	1
TOTAL (LIMESTONE)		6	8
BALUCHISTAN	Zhob . . . . .	...	2
CENTRAL PROVINCES	F.—CLAY.		
	Jabalpur . . . . .	...	1
MADRAS	Nellore	1	...
BIHAR AND ORISSA	Palamau, Daltonganj	1	...
TOTAL (CLAY)		2	1
CENTRAL PROVINCES	Jabalpur	1	...
BURMA	H.—WOLFRAM.		
	Tavoy	5	2
BURMA	Mogok	1	...
BIHAR AND ORISSA	Hazaribagh	1	...
	J.—TIN.		

APPENDIX I—concl'd.

Table No. 2—concl'd.

Number of mines opened and closed during the year ending 31st
December 1913—concl'd.

Province.	District.	Number of mines opened.	Number of mines closed.
K.—STEATITE.			
CENTRAL PROVINCES	Jabalpur	1	1
MADRAS	Kurnool	1	...
TOTAL (STEATITE)		2	1
L.—SLATE.			
BIHAR AND ORISSA	Monghyr . . . . .	...	3
PANJAB	Gurgaon	1	...
TOTAL (SLATE)		1	3
GRAND TOTAL		334	256

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, wolfram, corundum, and samarskite :—

YEAR.	Coal.	Manganese.	Mica.	Limestone.	Salt.
	Tons.	Tons.	Cwts.	Tons.	Tons.
1904	7,561,338	138,733	21,320	50,847	107,413
1905	7,770,471	204,164	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
1912	14,044,368	423,464	41,660	91,784	131,233
1913	15,486,318	637,391	43,650	71,259	133,540

APPENDIX I—concl'd.

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 1904 to 1913 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.
1904	7,561,388	82,002	55	7.27	.67
1905	7,770,471	79,506	58	7.46	.72
1906	9,112,668	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	105,285	160	14.05	1.52
1911	12,048,726	106,598	148	12.28	1.38
1912	14,044,368	121,892	157	11.17	1.29
1913	15,486,318	133,042	185	11.95	1.39

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.
1912	United Kingdom	260,398,578	1,089,090	239
1911	United States	443,054,614	722,335	613
"	Germany	230,817,206	700,874	329
"	Austria-Hungary	48,314,562	159,988	302
"	France	38,804,091	200,212	193
"	Belgium	22,689,430	144,350	157
"	Nova Scotia	6,208,444	12,522	496
"	British Columbia	2,297,718	6,873	334
"	Australia	10,550,127	21,663	487
"	Natal	2,892,456	9,824	244
"	Transvaal	3,878,286	8,830	439
"	Japan	17,354,217	145,412	119
"	New Zealand	2,066,073	4,290	482
1909	Russia	26,822,120	169,079	159
		1,115,447,922	3,395,342	329
1913	British India	15,486,318	133,042	116

APPENDIX II.
ACCIDENTS IN MINES.

Table No. 1.
List of Fatal Accidents in mines regulated by the Indian Mines Act, 1901, during the year 1913.

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—(29 deaths).						
1	10th May, 5-30 P.M.	Saltore Mine, Dishargarh P. O., Bengal.	Saltore Coal Co., Ltd.	Booku Manjhi, (m.), 40, <i>Miner.</i>	Coal	A contractor fired some shots first in the roof and then in the sides of a level. When the side shots were fired, some gas was ignited and deceased, who was 163 feet away, was burnt. He died two days afterwards. Another person was also burnt, but recovered. The contractor who was not authorised to fire shots, was fined and dismissed. Inspection and inquiry made. <i>See Report, page 6.</i>
2	20th July, 7-30 A.M.	Jamadoba Mine, Jamadoba P. O., Bihar and Orissa.	Indian Collieries Syndi- cate, Ltd.	Behari Singh, (m.), 26, <i>Main driver.</i>	Coal	Deceased and another main gallery driver went down the mine to start work in a main gallery on a Tuesday morning after the place had been stopped since the previous Friday. They went down before an official had been round to inspect the place. Some gas had accumulated and was set alight by the candle of deceased who went in first. He was burnt and died the same evening. His companion, who sat down at the mouth of the heading, was not burnt being protected by a heap of slack at the mouth of the gallery. Inspection and inquiry made. <i>See Report, page 7.</i>
3	22nd October, 5-30 P.M.	Chowrasi Mine, Dishargarh P. O., Bengal.	Equitable Coal Co., Ltd.	Kamal Manjhi, (m.), 35, Hupa Manjhi, (m.), 16, Bejoy Manjhi, (m.), 32, Lakhan Manjhi, (m.), 30, Rakhal Bauri, (m.), 35, Moti Bauri, (m.), 25, Bonamali Bauri, (m.), 25, Baikanta Bauri, No. 1, (m.), 44, Makunda Bauri, No. 1, (m.), 42, Makunda Bauri, No. 2, (m.), 20, Baikanta Bauri, No. 2, (m.), 45, <i>Miners.</i> Phula Manjhian, (f.), 12, Rani Manjhian, (f.), 26, Tusua Manjhian, (f.), 24, Kumi Baurin, (f.), 24, Heli Baurin, (f.), 20, <i>Miners kamins.</i> Biji Baurin, (f.), 40,	Coal	Smoke was found to be coming out of an incline and some coolies rushed out and said there was a fire underground. Two hours and a half afterwards a violent explosion occurred, which proved to be the first of a series of seven, gradually lessening in intensity. Three persons were killed on the surface by the first explosion, and the remaining deceased were subsequently found to be missing. They probably were suffocated before the first explosion occurred. Their bodies were not recovered as the mine had to be closed down. Inquiry made. <i>See Report, page 8.</i>

APPENDIX II—contd.

Fatal Accidents, 1913—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.
EXPLOSIONS OF FIRE DAMP—(contd.)						
Kudi Baurin, (f.), 40, <i>Dust kamins.</i> Bandhu Singh, (m.), 24, Sambhu Mahato, (m.), 26, <i>Hookmen.</i> Kirti Sakhal, (m.), 30, Sujat Sheik, (m.), 30, <i>Miners' sirdars.</i> Binda Sirdar, (m.), 35. <i>Compass sirdar.</i> Jaduba Dhobi, (m.), 17, <i>Compass carrier.</i> Taru Bauri, (m.), 60, <i>Rajmistri.</i> Sewri Bauri, (m.), 12, <i>Not employed.</i> Falari Hari, (m.), 30, <i>Private servant.</i>						
FALLS OF ROOF AND SIDES—(78 deaths).						
(a) Falls of roof—(41 deaths).						
4	18th January, 3 A.M.	Sanctoria Mine, Dishbargah P. O., Bengal.	Bengal Coal Co., Ltd.	Etware Muchi, (m.), 25, <i>Miner.</i>	Coal	Deceased was working at a pillar when a piece of overhanging roof consisting of stone and coal, 19' long by 5' 6" to 6" wide by 4' 10" thick, which was supported vertically on props, came away suddenly from a slip in the stone. In rushing out he was caught by the fall and killed on the spot. This long piece of roof required to be supported by diagonal struts as well as by vertical props. Inspection and inquiry made.
5	5th February, 4 P.M.	Bhulanbarari Mine, Jharla P. O., Bihar and Orissa.	Bhulanbarari Coal Co., Ltd.	Hiru Hari, (m.), 38, Gundu Hari, (m.), 35, Dirup Hari, (m.), 36, <i>Miners.</i> Abollaya Harini, (f.), 28, <i>Kamin.</i>	Coal	The four deceased were put to cut coal roof. They passed inbye under this roof coal, over a fence, and sat down to rest, when a fall of roof, about 5 tons, occurred, falling from a height of about 10 feet, killing them instantaneously. Inspection and inquiry made.
6	5th February, 4 P.M.	Davispur Mine, Duki P. O., Baluchistan.	K. S. Abdulla Asgarali	Fatfeh, (m.), 40, <i>Labourer.</i>	Coal	A large fall of roof occurred completely burying deceased. His body could not be recovered.

7	27th February, 2 P.M.	Kesabganj Mine, Kalipahari P. O., Bengal.	Ganpat Ram Marwari	Ramsi Manjhian, (f.), 27, Kamin.	Coal	Deceased went into old workings where she had no business to be and was caught by a fall of roof coal, about 30 feet square by 15 inches thick, and killed. Two men were injured while attempting to rescue her. Inspection and inquiry made.
8	2nd March, 7 A.M.	Barkui Mine, Pench P. O., Central Provinces.	Pench Valley Coal Co., Ltd.	Maindar Gond, (m.), 35, Miner. Hira Murai, (m.), 26, Bhagwanta Dhimir, (m.), 45, Dalli Ragbansi, (m.), 30, Jogi Gond, (m.), 30, Coal fillers. Pooran Katia, (m.), 26, Tub banksman.	Coal	The first three deceased climbed up over the fallen roof in a goaf area presumably to get some fallen roof coal, and were caught by a heavy roof fall. The others with the sirdar rushed in to try and extricate them and were in their turn caught by a further heavy fall and killed. Only one man named Fagu Gond got out alive and he was injured. Inspection and inquiry made.
9	7th March, 12-30 P.M.	Ledo Valley, West Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Harkabahadur Thapa, (m.), 30, Basket carrier.	Coal	Deceased was loading coal from a "chamber" when the roof began to weight. The sirdar shouted a warning and all persons except deceased were able to run into safety before the place collapsed. The chamber measured 30' x 24' x 11' high before the collapse, which increased the height to 20 feet. The body of deceased was recovered three days later. Inquiry made.
10	15th March, 9-30 P.M.	Bhaga Mine, Jharia P. O., Bihar and Orissa.	Jharia Colliery Co., Ltd.	Basi Manjhian, (f.), 13, Coal carrier.	Coal	Deceased was loading a coal basket at a point where an intermediate band of un-worked coal left between an upper and lower working in the same seam was being got when a mass of coal, 3' 6" x 3' x 2', fell upon her from a height of 7' 6". She was killed on the spot. Inspection and inquiry made.
11	28th March, 2 P.M.	Mudidih Mine, Sijua P. O., Bihar and Orissa.	Reliance Coal Co., Ltd.	Koda Meah, (m.), 45, Miner.	Coal	Deceased went into a goaf presumably to rob coal and was caught by a large fall of the main roof, the ground collapsing over an area measuring 100' x 70'. His body was not recovered. Inspection and inquiry made.
12	15th April, 7-30 A.M.	Pahargora Mine, Panuria P. O., Bengal.	F. W. Heilgers and Bros.	Mouzi Turi, (m.), 32, Miners' sirdar.	Coal	Deceased who was a gang sirdar went through a place fenced off on account of weak roof, probably with the object of seeing if he could not take the fencing down and start his miners, but the roof fell suddenly over an area 17' x 6' x 3' 4" causing injuries to his spine from which he died two days afterwards. Inspection and inquiry made.
13	23rd April, 10 A.M.	Dandot Mine, Dandot P. O., Panjab.	Thakur Das and Ramji Das.	Bukhs, (m.), 5, Miner.	Coal	Deceased, with his son, was hewing some overhanging roof coal when a piece of stone, measuring 2' 6" x 1' 9" x 9" to 1' 2", fell from the roof knocking out a prop and lid. This was followed by other small pieces of stone with the result that deceased was entrapped and buried between the prop and a chock. He succumbed in four hours owing to internal injuries. The son was slightly injured.
14	26th April, 4-30 A.M.	Simlabahal Mine, Jharia P. O., Bihar and Orissa.	Bhalgora Coal Co., Ltd.	Lachman Bilaspuri, (m.) 25, Miner.	Coal	Deceased was dressing down some overhanging coal from the side of a pillar, when a fall of roof, 13' x 11' x 2' to 0", occurred from a concealed slip in the roof. Two posts were dislodged, and the chair on which he was working was overturned. He was buried beneath the fall and killed. Inspection and inquiry made.
15	5th May, 1 P.M.	Tikak Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Dalmon Gorang, (m.), 28, Basket filler.	Coal	Deceased, whilst loading coal in a "chamber", 60' x 15' x 8' high, was killed on the spot by the fall of a ton of coal from the roof. The place had been properly inspected and tested, but the coal fell without warning. Death due to misadventure. Inquiry made.

APPENDIX II—*contd.*

Fatal Accidents, 1913—*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.
EXPLOSIONS OF FIRE DAMP—(contd.)						
<p>Kudi Baurin, (f.), 40, <i>Dust kamins.</i> Bandhu Singh, (m.), 24, Sambhu Mahato, (m.), 26, <i>Hookmen.</i> Kirti Sakhal, (m.), 30, Sujat Shoik, (m.), 30, <i>Miners' sirdars.</i> Binda Sirdar, (m.), 35, <i>Compass sirdar.</i> Jaduba Dhobi, (m.), 17, <i>Compass carrier.</i> Taru Bauri, (m.), 60, <i>Rajmistri.</i> Sewri Bauri, (m.), 12, <i>Not employed.</i> Falari Hari, (m.), 30, <i>Private servant.</i></p>						
FALLS OF ROOF AND SIDES—(78 deaths).						
(a) Falls of roof—(41 deaths).						
4	18th January, 3 A.M.	Sanctoria Mine, Dishargah P. O., Bengal.	Bengal Coal Co., Ltd.	Etwari Muchi, (m.), 25, <i>Miner.</i>	Coal	Deceased was working at a pillar when a piece of overhanging roof consisting of stone and coal, 19' long by 5' 6" to 0" wide by 4' 10" thick, which was supported vertically on props, came away suddenly from a slip in the stone. In rushing out he was caught by the fall and killed on the spot. This long piece of roof required to be supported by diagonal struts as well as by vertical props. Inspection and inquiry made.
5	5th February, 4 P.M.	Bhulanbarari Mine, Jharia P. O., Bihar and Orissa.	Bhulanbarari Coal Co., Ltd.	Hiru Hari, (m.), 38, Gundu Hari, (m.), 35, Dirup Hari, (m.), 36, <i>Miners.</i> Ahollaya Harini, (f.), 28, <i>Kamin.</i>	Coal	The four deceased were put to cut coal roof. They passed inbye under this roof coal, over a fence, and sat down to rest, when a fall of roof, about 5 tons, occurred, falling from a height of about 10 feet, killing them instantaneously. Inspection and inquiry made.
6	5th February, 4 P.M.	Davispur Mine, Duki P. O., Baluchistan.	K. S. Abdulla Asgarali	Fatfeh, (m.), 40, <i>Labourer.</i>	Coal	A large fall of roof occurred completely burying deceased. His body could not be recovered.

7	27th February, 2 P.M.	Kessabganj Mine, Kalipahari P. O., Bengal.	Ganpat Ram Marwari	Ramsi Manjhian, (f.), 27, <i>Kamin.</i>	Coal	Deceased went into old workings where she had no business to be and was caught by a fall of roof coal, about 30 feet square by 15 inches thick, and killed. Two men were injured while attempting to rescue her. Inspection and inquiry made.
8	2nd March, 7 A.M.	Barkui Mine, Pench P. O., Central Provinces.	Pench Valley Coal Co., Ltd.	Maindar Gond, (m.), 35, <i>Miner.</i> Hira Murai, (m.), 26, Bhagwanta Dhimir, (m.), 45, Dalli Bagbansi, (m.), 30, Jogi Gond, (m.), 30, <i>Coal fillers.</i> Pooran Katia, (m.), 26, <i>Tub bankman.</i>	Coal	The first three deceased climbed up over the fallen roof in a goaf area presumably to get some fallen roof coal, and were caught by a heavy roof fall. The others with the sirdar rushed in to try and extricate them and were in their turn caught by a further heavy fall and killed. Only one man named Fagu Gond got out alive and he was injured. Inspection and inquiry made.
9	7th March, 12-30 P.M.	Lodo Valley, West Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Harkabahadur Thapa, (m.), 30, <i>Basket carrier.</i>	Coal	Deceased was loading coal from a "chamber" when the roof began to weight. The sirdar shouted a warning and all persons except deceased were able to run into safety before the place collapsed. The chamber measured 30' x 24' x 11' high before the collapse, which increased the height to 20 feet. The body of deceased was recovered three days later. Inquiry made.
10	15th March, 9-30 P.M.	Bhaga Mine, Jharia P. O., Bihar and Orissa.	Jlaria Colliery Co., Ltd.	Basi Manjhian, (f.), 13, <i>Coal carrier.</i>	Coal	Deceased was loading a coal basket at a point where an intermediate band of un-worked coal left between an upper and lower working in the same seam was being got when a mass of coal, 3' 6" x 3' x 2', fell upon her from a height of 7' 6". She was killed on the spot. Inspection and inquiry made.
11	28th March, 2 P.M.	Mudidih Mine, Sijua P. O., Bihar and Orissa.	Reliance Coal Co., Ltd.	Koda Mesh, (m.), 45, <i>Miner.</i>	Coal	Deceased went into a goaf presumably to rob coal and was caught by a large fall of the main roof, the ground collapsing over an area measuring 100' x 70'. His body was not recovered. Inspection and inquiry made.
12	15th April, 7-30 A.M.	Pahargora Mine, Panuria P. O., Bengal.	F. W. Heilgers and Bros.	Mouzi Turi, (m.), 32, <i>Miners' sirdar.</i>	Coal	Deceased who was a gang sirdar went through a place fenced off on account of weak roof, probably with the object of seeing if he could not take the fencing down and start his miners, but the roof fell suddenly over an area 17' x 6' x 2' 4" causing injuries to his spine from which he died two days afterwards. Inspection and inquiry made.
13	23rd April, 10 A.M.	Dandot Mine, Dandot P. O., Panjab.	Thakur Das and Ramji Das.	Bukhsh, (m.), 5, <i>Miner.</i>	Coal	Deceased, with his son, was hewing some overhanging roof coal when a piece of stone, measuring 2' 6" x 1' 9" x 9" to 1' 2", fell from the roof knocking out a prop and lid. This was followed by other small pieces of stone with the result that deceased was entrapped and buried between the prop and a chock. He succumbed in four hours owing to internal injuries. The son was slightly injured.
14	26th April, 4-30 A.M.	Simlabahal Mine, Jharia P. O., Bihar and Orissa.	Bhalgora Coal Co., Ltd.	Lachman Bilaspuri, (m.) 25, <i>Miner.</i>	Coal	Deceased was dressing down some overhanging coal from the side of a pillar, when a fall of roof, 13' x 11' x 2' to 0", occurred from a concealed slip in the roof. Two posts were dislodged, and the chair on which he was working was overturned. He was buried beneath the fall and killed. Inspection and inquiry made.
15	5th May, 1 P.M.	Tikak Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ltd.	Dalmon Gorung, (m.), 28, <i>Basket filler.</i>	Coal	Deceased, whilst loading coal in a "chamber", 60' x 15' x 8' high, was killed on the spot by the fall of a ton of coal from the roof. The place had been properly inspected and tested, but the coal fell without warning. Death due to misadventure. Inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1913—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.						
16	20th June, 10-30 A.M.	Ledo Valley, West Mine, Margherita P. O., Assam.	Assam Railways & Trading Co., Ltd.	Champa Ghatwal, (f.), 26, <i>Coal thanner.</i>	Coal	Whilst deceased and two other women were shovelling coal down a narrow dip road between a "chamber" and the tram level below, a slab of coal, 7' long × 3' wide and 1' thick, fell from a "slip." Deceased was killed on the spot. The other women escaped with slight injuries. Inquiry made.
17	(About) 15th July, 1 P.M.	Maharamnagar Mine, Paharpur P. O., Delhi.	Lakhiya Julaha	Aladdin Sheik, (m.), 22, <i>Miner.</i>	Clay	About 2 tons of earth fell from the roof and buried deceased and killed him. There was only about 8 ft. of cover and it was the surface soil which fell. Inspection and inquiry made.
18	22nd August, 5 A.M.	Pandgatchia Mine, Sitarampur P. O., Bengal.	Lutehipur Coal Co., Ltd.	Sander Manjhi, (m.), 37, <i>Miner.</i>	Coal	Deceased was cutting down roof coal, 15" thick, in a gallery 15' wide and 7' 6" high, when a piece of coal at which he was working, measuring 2' 6" × 2' × 1' 3", fell and fractured one of his ribs, from the effects of which he died two days later. Inspection and inquiry made.
19	27th August, 3 P.M.	Budruchak Mine, Sijua P. O., Bihar and Orissa.	Budruchak Coal Mining Co., Ltd.	Rupar Manjhi, (m.), 38, <i>Head sirdar.</i>	Coal	Deceased, who was the head sirdar, was engaged with timber men in knocking out props in a pillaring area. After knocking out two props the roof showed signs of coming down and they retreated, but deceased went back to inspect. The roof suddenly came down over an area 40' × 40' swaying out 60 or 70 props and he was entombed. There was only 45 ft. of cover and the main roof must have been very unsound. Inspection and inquiry made.
20	4th September, 3-30 A.M.	Mudidih Mine, Sijua P. O., Bihar and Orissa.	Reliance Coal Co., Ltd.	Sahadeb Kol, (m.), 22, <i>Miner.</i>	Coal	A fall of roof, 12' × 6' × 1' 6", occurred suddenly in a dip and rise gallery, close to the working place of deceased and his mate. According to the latter, who survived, they were walking out when it occurred, but there was a strong suspicion that they had been tampering with the roof by cutting roof coal. Deceased died by suffocation before he could be rescued. Inspection and inquiry made.
21	11th September, 10 A.M.	Huntodih Mine, Mohoda P. O., Bihar and Orissa.	Huntodih Coal Co., Ltd.	Rupan Mahato, (m.), 36, <i>Coolie.</i>	Coal	While a Tangee duplex 12' × 6" pump was being lowered down the incline it broke loose and slid on skids about 40 yards, knocking out some timber; this caused a roof fall, 12' × 12' × 2', to fall on top of deceased. He died from his injuries five days later. Inspection and inquiry made.
22	17th September, 10 A.M.	Madhuband Mine, Nowagarh P. O., Bihar and Orissa.	Jumoni Coal Co., Ltd.	Bhima Singh, (m.), 22, <i>Bailer.</i>	Coal	Deceased was caught by a fall of roof, 6' × 6' × 6", under which he and two other men were sitting. Deceased died of his injuries on the third day. The other two men were injured. Inspection and inquiry made.
23	21st October,	North Anantapur Mine,	North Anantapur Gold	Rangappak, (m.), 33,	Gold	The roof of an underhand stope fell suddenly over an area of about 80' × 45' × 7½'

	4-30 A.M.	Morrison P. O., Madras.	Mines, Ld.	<i>Stuff coolie.</i> Chikanna, (m.), 30, <i>Blaster.</i> Narappa, (m.), 38, Lalu, (m.), 20, Obelasu, (m.), 30, Muthial Gadu, (m.), 38, Chitty Gowda, (m.), 35, <i>Stuff coolies.</i>		thick. The ground was of a mixed nature which probably accounted for the sudden way it fell without any warning: about 2,000 tons fell burying deceased. The bodies were recovered with great difficulty. Inspection and inquiry made.
24	25th October, 7 A.M.	Bhagaband Mine, Jharia P. O., Bihar and Orissa.	Borrea Coal Co., Ld.	Jagan Bhuia, (m.), 35, <i>Miner.</i>	Coal	Deceased was killed outright by a pane of roof stone, measuring 8' x 4' x 18" thick tapering to an edge, which fell from between two "alips" in a roadway 7 feet high. Two props were swayed out, but whether they were actually under the stone or not cannot be ascertained. The man was either travelling along the road or sitting at the spot. Inspection and inquiry made.
25	5th November, 12 Midnight.	Madhubpur Mine, Ondal P. O., Bengal.	Imperial Coal Co., Ld.	Lakhan Kora, (m.), 30, <i>Coal-cutter.</i>	Coal	Deceased, after driving a wedge into a piece of roof-coal to get it down, sat down to smoke when the piece which was 8' x 3' x 6", fell close to him and a portion struck him on the chest. He died within an hour from internal hæmorrhage. Inspection and inquiry made.
26	21st November, 2 A.M.	Kendwadih Mine, Kusunda P. O., Bihar and Orissa.	East Indian Coal Co., Ld.	Chintamon Chamar, (m.), 50, <i>Coal-cutter.</i>	Coal	Deceased was warned by the sirdar not to work at a certain place in the pillar workings, but returned, unknown to the latter, and was killed on the spot by a fall of coal weighing 1 cwt. which fell from a height of 13 feet. Inspection and inquiry made.
27	24th November, 12-30 P.M.	Jamuria Mine, Nandi P. O., Bengal.	Equitable Coal Co., Ld.	Joton Bauri, (m.), 19, <i>Line-coolie.</i>	Coal	A piece of roof-stone, 6' x 6' x 1', exposed at a cross road, fell on deceased as he was passing underneath and fractured his thigh and dislocated his hip joint. He died shortly afterwards from internal hæmorrhage and shock. Inspection and inquiry made.
28	9th December, 2 P.M.	New Khas Jharia Mine, Jharia P. O., Bihar and Orissa.	Ramjus Agarwala	Tara Manjhi, (m.), 38, <i>Coal-cutter.</i>	Coal	Deceased was engaged in a level gallery driven off the east side of a dip gallery. The level gallery had been driven about 2 feet in. A sudden fall of roof, 29' x 7' x 2', occurred, falling from a height of 11 feet. Deceased was killed on the spot. A woman was injured. Inspection and inquiry made.
29	26th December, 1-30 P.M.	West Kantapahari Mine, Katrasgarh P. O., Bihar and Orissa.	Angarpatra Colliery Co., Ld.	Kailu Turi, (m.), 25, <i>Miner.</i>	Coal	Whilst deceased was robbing coal from the side of the gallery in which he worked, roof stone, measuring from 2" to 10" in thickness, fell over an area of 50 square feet. He was killed on the spot. Inspection and inquiry made.
30	30th December, 8 P.M.	Lakorka Mine, Katrasgarh P. O., Bihar and Orissa.	Lakorka Coal Co., Ld.	Sukhamani Manjhian, (f.), 33, <i>Coal-carrier.</i>	Coal	Deceased was employed as a coal carrier to a coal cutter working on roof coal. Whilst she was loading coal at the working place a piece of coal, weighing about 1 cwt., fell from the roof at a height of 7 feet and inflicted injuries from which she died twelve hours later. Inspection and inquiry made.
(b) Falls of side—(37 deaths.)						
31	3rd January, 11 A.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Ahmad Ali, (m.), 21, <i>Carpenters' coolie.</i>	Coal	While deceased was assisting the carpenter to set a prop a fall of coal occurred, which resulted in the fracture of his left thigh. He was taken to hospital and at first made satisfactory progress, but becoming impatient he opened the bandages and re-opened the wound which did not heal again; he was also suffering from dysentery and died six weeks after the accident. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1913—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 side—contd.						
32	10th January, 9 A.M.	Gumgaon Mine, Ramtek P. O., Central Provinces.	Central Provinces Pros- pecting Syndicate, Ld.	Seetaram Lodhi, (m.), 30, <i>Miner.</i>	Manganese	Deceased was working on an old waste dump getting ore when the whole side for a length of 22 feet × 10 feet high × 4 to 5 feet wide, fell on him and buried him. He was dead when recovered an hour later. He had been warned about undercutting the day before, but was in all probability doing this at the time. Inspection and inquiry made.
33	16th January, 10-30 A.M.	Charanpur Mine, Charanpur P. O., Bengal.	Apcar & Co.	Goohia Mnochi, (m.), 30, <i>Coal-cutter.</i>	Coal	Deceased was trying to get a piece of coal off a pillar in a pillar district when the piece fell suddenly and broke his leg. The piece measured 5' × 6' × 3' and fell from a height of 5 feet from the ground. He died about six hours afterwards from shock. Inspection and inquiry made.
34	28th January, 10 A.M.	Barari Mine, Kustore P. O., Bihar and Orissa.	East Indian Coal Co., Ld.	Pabina Dhubin, (f.), 22, <i>Coal-carrier.</i>	Coal	A portion of the side coal of a gallery, 28 feet long by 10 feet high by 3 feet 6 inches to 0' thick, suddenly fell without warning, killing deceased, who was standing in the gallery, outright. The gallery was 11 feet high. Inspection and inquiry made.
35	10th February, 3 P.M.	Tikaria Plot, No. 17 Mine, Murwara P. O., Central Provinces.	Seth Ram Chand	Santi Kol, (f.), 9, <i>Kamins.</i>	Limestone	Deceased was carrying out spoil in an excavation when the bank on one side fell and in trying to get out of the way she slipped and was caught by the earth which fell, measuring about 15' × 5' × 8'; she was buried up to her waist and her leg was severed above the knee by a sharp piece of limestone. She died of shock in hospital seven hours later. Inspection and inquiry made.
36	21st February, 2-30 P.M.	Toposi Mine, Chowkidanga P. O., Bengal.	Bansrah Coal Co., Ld.	Katuri Baurin, (f.), 13, <i>Coal kamin.</i>	Coal	Some miners, when taking a slice off a pillar, left an overhanging piece which was dangerous. Deceased and other kamins, though warned not to go to this place, went there and deceased was caught by a piece, measuring 1' 3" × 1' × 1", which fell on her. She died from shock. Inspection and inquiry made.
37	17th March, 10 A.M.	Bhuggutdih Mine, Dhanbaid P. O., Bihar and Orissa.	Bengal-Nagpur Coal Co., Ld.	Sriram Manjhi, (m.), 30, <i>Coal-cutter.</i>	Coal	A piece of coal 16' high × 6' × 2' fell off the side of a pillar which was being worked and knocked out three props, one of which hit deceased on the head, while he was sitting 18 feet away, killing him instantaneously. Inspection and inquiry made.
38	18th March, 2-30 P.M.	Balaghat Mine, Kamptee P. O., Central Provinces.	Central Provinces Pros- pecting Syndicate, Ld.	Binglu Marar, (m.), 19, <i>Rock-er-worker.</i>	Manganese	As deceased was boring a hole, a piece of stone, 10' × 5' × 3', fell from a step just above him, and hit his head and side, killing him instantaneously. Inspection and inquiry made.
39	21st March, 3 A.M.	Bhaga Mine, Jharia P. O., Bihar and Orissa.	Jharia Colliery Co., Ld.	Seopal Koiril, (m.), 30, <i>Miner.</i>	Coal	A piece of coal, measuring 1' 6" × 1' × 6", fell about 20 feet from the top of a pillar, the side of which was being dressed, and struck deceased between the shoulders as he was stooping to pick up some fallen coal. He expired almost immediately. Inspection and inquiry made.

40	22nd April, 11 P.M.	Ledo Valley, Old West Mine, Margherita P. O., Assam.	Assam Railways Trading Co., Ld.	and	Mannoo Passi, (m.), 30, <i>Coal shoveller.</i>	Coal	Whilst coal was being cut from the top rib in a "chamber", deceased stood 12 feet below and was killed by the fall of a mass of some 25 cwts. of coal which fell away from a "slip". Death was due to carelessness on the part of the deceased and the subordinate official in charge. Inspection and inquiry made.
41	7th May, 8-30 A.M.	Ledo Valley, Old West Mine, Margherita P. O., Assam.	Assam Railways Trading Co., Ld.	and	Madhu Lal Sonar, (m.), 35, <i>"Chamber" man.</i>	Coal	Deceased was in a highly inclined "chamber," the upper part of which was full of loose coal. The manager himself instructed him how to make the coal "run" by standing in a bolt hole and undermining the loose coal with a long crowbar. On returning a few minutes later the manager found the lower part of the "chamber" full of coal, and no sign of deceased. His voice could be heard for some time, but life was extinct when his body was recovered, standing against the side of and 6 feet within the "chamber", two hours later. Death was due to disobedience of orders. Inspection and inquiry made.
42	15th May, 10-30 A.M.	Sitanala Mine, Bhujudih P. O., Bihar and Orissa.	P. N. Roy and Co.		Kalpa Bauri, (m.), 23, <i>Coal carrier.</i>	Coal	Deceased went, presumably over a fence, and sat down at one end of the quarry, when about half a ton of coal and earth fell on him, injuring him so severely that he died in half an hour. Inspection and inquiry made.
43	17th May, 5-30 P.M.	Garbham Mine, Chipurupalli P. O., Madras.	Vizianagram Mining Co., Ld.		Yatha Bangarigadu, (m.), 30, Kondra Rami, (f.), 20, <i>Coolies.</i>	Manganese	While deceased and other coolies were piling their tools under a bank, preparatory to going to take shelter from a storm, the sides slipped and about two tons fell burying deceased and partially burying three children also—the latter were extricated without any serious injury but when deceased were got out they had been asphyxiated. Inspection and inquiry made.
44	20th May, 10 A.M.	Pagaye Mine, Tavoy P. O., Lower Burma.	Rangoon Mining Co., Ld.		Ah Saing, (m.), 30, <i>Miner.</i>	Wolfram	Deceased was undercutting a face of overburden about 15 feet high when a fall of about 10 tons of earth fell and buried him. He was killed on the spot. Two days before the manager had warned him not to work there until he had removed the overhanging portion. Inquiry made.
45	17th June, 5 P.M.	Putletto Mine, Tavoy P. O., Lower Burma.	Khoo Jin Teik		Lim Kie Pok, (m.), 37, <i>Mining coolie.</i>	Wolfram	Whilst working in an open cut the deceased was buried by the fall of overburden from one of the walls of the cut. Probably about two tons fell from a height of about 15 feet. Inquiry made.
46	21st June, 11 A.M.	Dheriajoba Mine, Kusunda P. O., Bihar and Orissa.	Dheriajoba Coal Co., Ld.		Larua Kaharin, (f.), 14, <i>Earth kamin.</i>	Coal	Deceased, Larua Kaharin, was carrying a load of earth out of the incline, the sides of which were being dressed to put in side walls for arching, when about 3 tons of earth from the side fell and buried her and two children who accompanied her, but who were not employed. All three were killed. The side which fell was composed of burnt shale and clay and should have been dressed back instead of being left vertical. Inspection and inquiry made.
47	14th July, 11 A.M.	Salanpur Mine, Sitarampur P. O., Bengal.	Borrea Coal Co., Ld.		Sagram Manjhi, (m.), 24, <i>Coal-cutter.</i>	Coal	Deceased deliberately went through a fence to rob an old stock of coal and was caught by an overhanging piece, weighing about three tons, which fell directly he struck it. He was killed instantaneously. Inspection and inquiry made.
48	15th July, 10 A.M.	Burragarh Mine, Jharia P. O., Bihar and Orissa.	Panjab-Bengal Coal Co., Ld.		Matilal Bauri, (m.), 30, <i>Coal-cutter.</i>	Coal	Deceased, though twice warned away from the place by officials, returned to a corner of a pillar to cut it, when about one ton fell on him and fractured his left leg severely. He was sent to Dhanbaid Hospital to have the leg amputated, but died from shock on the way. Inspection and inquiry made.
49	14th August, 9 A.M.	North Anantapur Mine, Morrison P. O., Madras.	North Anantapur Gold Mines, Ld.		Karriapa, (m.), 40, <i>Slope mistri.</i>	Gold	Deceased was getting down a piece of loose ground in a stope at the top of a winze when it came away and he was knocked down the winze, a distance of 60 feet. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1913—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 side—contd.						
50	15th August, 7 A.M.	Jamadoba Mine, Jamadoba P. O., Bihar and Orissa.	Indian Collieries Syndi- cate, Ld.	Ram Charan Dosadh, (m.), 40, Sirdar.	Coal .	While deceased was making chalk marks on the coal face in the course of his morning round, about one ton of coal fell off a "slip" and crushed him so severely about the body that he was killed instantaneously. The "slips" which are vertical occur with great regularity 20 to 24 inches apart and the coal was not spragged. Inspection and inquiry made.
51	26th August, 6-30 A.M.	Jamadoba Mine, Jamadoba P. O., Bihar and Orissa.	Indian Collieries Syndi- cate, Ld.	Boiya Mahato, (m.), 26, Miner.	Coal .	Deceased deliberately crossed a fence to get some coal that had fallen in a goaf when another piece, weighing about 1½ cwts. fell from the corner of a pillar on to him. His arm and head were injured and he died from shock and loss of blood two hours afterwards. Inspection and inquiry made.
52	26th August, 12-15 P.M.	Barari Mine, Kustore P. O., Bihar and Orissa.	East Indian Coal Co., Ld.	Aguni Jolahin, (f.), 24, Sohiday Jolahin, (f.), 14, Coal-carriers.	Coal .	The deceased were loading from a pillar that had been dropped when about 1½ tons of coal slipped from the portion of the pillar left standing, as a guide to the state of the roof, and killed them both. Inspection and inquiry made.
53	27th August, 6 A.M.	Bhuggudih Mine, Dhanbaid P. O., Bihar and Orissa.	Bengal Nagpur Coal Co., Ld.	Dhoni Meah, (m.), 35, Coal-cutter.	Coal .	Deceased left his working place and crossed a fence to rob coal in another place. A fall of two tons of coal came away from an inverted cleat in the coal, and killed him instantaneously. Inspection and inquiry made.
54	18th October, Unknown (night).	Kendwadih Mine, Nowgarh P. O., Bihar and Orissa.	Chamanlal Mangaldas and Co.	Chamu Garai, (m.), 42, Miner.	Coal .	Deceased broke down a fence and entered some old workings to rob a pillar. His body was found buried beneath a fall of about 12 tons of side coal. Inspection and inquiry made.
55	24th October, 9 A.M.	Tikak, Upper Mine, Margherita P. O., Assam.	Assam Railways and Trad- ing Co., Ld.	Tikaram Thapa, (m.), 18, Coal-carrier.	Coal .	Deceased was employed as a coal loader in a "chamber" 40' x 20' x 7'—18' high. The roof began to weight and the head sirdar, Bhikom, ordered every one out. Deceased stood with Bhikom and two other men at the entrance to a "bolt-hole" to await developments. Without warning a mass of 6½ tons of coal fell from the side and roof over the "bolt-hole". Deceased was killed on the spot and Bhikom was buried by the coal but escaped with a few bruises. The coal fell from concealed "slips" through which water from the outcrop was percolating. Inquiry made.
56	25th October, 11-30 A.M.	Brindabanpur Model Mine, Mugma P. O., Bihar and Orissa.	P. C. Tarafdar	Mathur Bauri, (m.), 25, Miner.	Coal .	A heavy fall of coal occurred in some old workings which were properly fenced. Miners at once rushed to the place, and discovered deceased beneath the fall. His pick and basket were by his side, so it is presumed that he had started to rob a pillar. He had been seen in his proper working place by the manager an hour before. The coal which fell measured 9' x 5' 4" x 4' 6" and it fell a distance of 7' 6". Inspection and inquiry made.

57	4th November, 9-30 P.M.	Bhulanbarari Mine, Jharis P. O., Bihar and Orissa.	Bhulanbarari Coal Co., Ld.	Joshi Dhobi, (m.), 42, <i>Miner.</i>	Coal	Deceased was found buried beneath about seven tons of coal which had fallen from the corner of a pillar in some disused and fenced workings. It is surmised that he had been robbing the pillar. He died from his injuries two hours later. Inspection and inquiry made.
58	7th November, 1 P.M.	Kyaukmedaung Mine, Tavoy P. O., Lower Burma.	S. Crawshaw and Qah Cheng Guan.	Chang Hong, (m.), 28, <i>Miner.</i>	Wolfram	Deceased, whilst working in an open cut, was buried by the fall of loose ground from the side which was only 9 feet high. Inquiry made.
59	8th November, Midnight.	Kesalpur Mine, Katrasgarh P. O., Bihar and Orissa.	R. M. Pal and Brothers	Phutia Kamarin, (f.), 14, <i>Slack-carrier.</i>	Coal	Deceased entered a gallery under repair. She was ordered to leave the place, but refused. A pane of coal, measuring 10' x 6' 6" x 2' 6" at the thick end tapering to a feather edge at the other, fell from the side without warning and killed her outright. A sirdar was dismissed and a roof dresser was fined. Inspection and inquiry made. <i>See Report, page 10.</i>
60	11th November, 5 A.M.	Jamadoba Mine, Jamadoba P. O., Bihar and Orissa.	Indian Collieries Syndi- cate, Ld.	Fagu Meah, (m.), 30, <i>Coal-cutter.</i>	Coal	All the miners had been removed from a goaf on account of weighting and a fence had been erected. Subsequently the sirdar went through the fence to see if timber could be saved and he was closely followed by deceased who, contrary to orders, went in to try to get some coal to complete his tub. He picked up some pieces which he placed beyond the fence and then returned to get more when a fall of coal occurred and he was killed on the spot. Inspection and inquiry made.
61	19th November, 4 P.M.	Hpaungdow Mine, Tavoy P. O., Lower Burma.	Liebaoak Syndicate	How Shein, (m.), 42, <i>Coolie.</i>	Wolfram	Whilst working in an open cut the deceased was buried by the fall of about two tons of earth from the side. Inquiry made.
62	28th November, 1-30 A.M.	Bhaga Mine, Jharis P. O., Bihar and Orissa.	Jharis Colliery Co., Ld.	Thakoo Passi, (m.), 40, <i>Sirdar.</i>	Coal	Deceased was in charge of a gang of miners who were loading coal from a dropped pillar on the edge of the goaf. Coal began to roll down from the fallen heap and he sent the miners back and remained to watch developments. Two large irregular lumps, weighing about 30 and 10 cwts., respectively, rolled down from the heap and knocked out a prop 8' 6" in length. This prop struck him and he sustained injuries from which he died shortly afterwards. Inspection and inquiry made.
63	19th December, 8-30 A.M.	Ledo Valley, West Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ld.	Tilok Bahadur, (m.), 22, <i>Thanning coolie.</i>	Coal	Deceased was shovelling coal in a "chamber", 30' x 18' x 20' high, which had been examined about half an hour before and found safe by the European foreman. About 7 cwts. of coal fell from the side and struck him, inflicting injuries from which he died before he reached hospital. Inspection and inquiry made.
64	27th December, 9 P.M.	Bhulanbarari Mine, Jharis P. O., Bihar and Orissa.	Bhulanbarari Coal Co., Ld.	Kita Bauri, (m.), 35, <i>Miner.</i>	Coal	Deceased worked in an area of pillars in a thick seam where working in two stages had been carried on. He and a special gang of miners were employed in removing the partition of coal, 2' to 6' thick, between the two stages. The place was 25 feet high and from 25 to 43 feet wide. Owing to overhanging coal it became unsafe on the day shift, and the European Assistant withdrew the miners and erected fences. The deceased went through the fence and began to get coal from the corner of a pillar. He was killed by the fall of a mass of some three tons of coal from a height of 15 feet. A sirdar's pole, a ladder and a crowbar were found at the spot. Inspection and inquiry made.
65	29th December, 10 A.M.	Kuldiha Mine, Giridih P. O., Bihar and Orissa.	Bengal Coal Co., Ld.	Ramjit Rajwar, (m.), 31, <i>Miner.</i>	Coal	A piece of coal, measuring 16' x 6' x 2' 6" thick, fell from an undisclosed "slip" in the side of a pillar near a goaf in which deceased and three others were loading up loose coal and struck deceased on the back killing him outright. The side was overhanging to an angle of 69°. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1913—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.
<p>IN SHAFTS—(29 deaths). Overwinding—(1 death).</p>						
66	10th January, 10 A.M.	Bhulanbarari Mine, Jharia P. O., Bihar and Orissa.	Bhulanbarari Coal Co., Ltd.	Domon Mahato, (m.), 22, Stone cutter.	Coal.	While an empty water barrel was at the top of the pit some unknown person, in the absence of the engineman, started the engine. The barrel was overwound, the bell of the safety hook was shattered by the concussion, and the barrel fell down the pit, killing deceased, who was standing on a pump staging in the shaft. Inspection and inquiry made.
<p>Ascending or descending by machinery—(14 deaths).</p>						
67	8th February, 9-30 A.M.	Bonahir Mine, Jharia P. O., Bihar and Orissa.	Standard Coal Co., Ltd.	Subedar Khan, (m.), 25, Pumpman.	Coal.	Deceased went up the pit in the bucket and when almost halfway up signalled to stop. He then, from some unknown cause, fell to the bottom, about 120 feet down and was killed instantaneously. Inspection and inquiry made.
68	28th April, 8-30 A.M.	Loyabad Mine, Bansjora P. O., Bihar and Orissa.	Barakar Coal Co., Ltd.	Jossai Korin, (f.), 45, Dust kamin.	Coal.	Deceased was riding down for the first time in her life in a cage with two other kamins and when the cage was in the shaft it was stopped and deceased presumably thought the shaft bottom was reached and stepped out, falling down to the landing and being killed almost instantaneously. There were no gates or chains on the cage, nor did any of the occupants have any light. Inspection and inquiry made.
69	8th July, 5 P.M.	Charanpur Mine, Charanpur P. O., Bengal.	Reliance Coal Co., Ltd.	Balir Manjhan (f.), 18, Coal kamin.	Coal.	Deceased with her husband was riding up a pit, 187 feet in depth, when she fell out from about halfway up. It is not known how she happened to fall, but possibly she opened one of the safety chains with which the cage was fitted and which were said to have been fastened, and lost her balance. She was killed instantaneously. Inspection and inquiry made.
70	10th July, 2-30 P.M.	Chinchuria Mine, Asansol P. O., Bengal.	New Birbhum Coal Co., Ltd.	Mahan Manjhi, (m.), 32, Tramline coolie.	Coal.	Deceased got into the cage alone on the surface and while being lowered in the shaft, which was 420 feet deep, she fell out soon after leaving the pit bank. There was no evidence to show why she fell. The cage was not provided with chains or gates, though originally gates had been used. They had been discarded about twelve months ago by a former manager. Inspection and inquiry made.
71	18th August, 8 A.M.	Dishargarh Mine, Dishargarh P. O., Bengal.	Equitable Coal Co., Ltd.	Udit Ahir, (m.), 50, Plate layer.	Coal.	Deceased, while going down in the morning with five other men, fell out of the cage. The cage was fitted with safety bars, consisting of a cross bar of 4" square iron hinged at one end and with a hook at the other end and this was in position at the time. He had been suffering from fever and probably fainted in the cage and slipped under the bar which was 3' 6" off the floor of the cage. He was killed instantaneously. Inspection and inquiry made.

72	20th September, 5-30 P.M.	Bhulanbarari Mine, Jharia P. O., Bihar and Orissa.	Bhulanbarari Coal Co., Ld.	Bundia Korin, (f.), 15, <i>Dust kamia.</i>	Coal .	Deceased and three other kamins were being lowered down No. 1 pit when her cloth was caught by the descending pit top sliding gate and was pulled off her. She let go her hold of the cage and made a grab at her cloth, overbalanced and fell to the bottom of the shaft, some 290 feet, and was killed instantaneously. The cage was not provided with any sort of safety gate. Had it been so the accident could hardly have occurred. Inspection and inquiry made.
73	16th October, 5-30 P.M.	Kendwadih Mine, Jamadoba P. O., Bihar and Orissa.	Hariladih Coal Co., Ld.	Dukhit Panka, (m.), 38, <i>Sirdar.</i>	Coal .	Deceased was descending a shaft 215' deep when 4 feet from the bottom he jumped out of the cage, slipped on the flat sheets (he was wearing boots), and fell backwards. Before he could rise the cage came to rest on his neck and he was killed outright. Inspection and inquiry made.
74	23rd October, 9 P.M.	Sodepur Nos. 9 and 10 Pits, Sitarampur P. O., Bengal.	Bengal Coal Co., Ld.	Chotton Dosadh, (m.), 30, Kuldip Dosadh, (m.), 33, <i>Main gallery drivers.</i> Kundan Manjhi, (m.), 25, Sagar Manjhi, (m.), 30, <i>Coal cutters.</i>	Coal .	Owing to a joint in the pump lodge at the 400' level breaking the bottom pipe of a 6" water column was forced out into the shaft and fouled the descending cage with five men in it. This threw the cage out of position and resulted in its collision with the descending cage. Three of the deceased were thrown out to the shaft bottom 456 feet below. Two other men were injured by being thrown against the side of the cage, but were not thrown out. One subsequently died of his injuries. Inspection and inquiry made.
75	17th December, 2-30 P.M.	Jibutil Mine, Morrison P. O., Madras.	Jibutil Gold Mines, Ld.	Patnam Murugesu, (m.), 30, <i>Timber coolie.</i>	Gold .	There were no witnesses to this accident, but it was presumed that deceased signalled to hoist and then jumped into the skip whilst it was in motion. Riding in the skip was strictly prohibited and a notice to this effect was posted on the shaft head. Deceased must have been killed instantaneously, his head being severed from his body.
76	24th December, 7 P.M.	Budruchak Mine, Sijua P. O., Bihar and Orissa.	Budruchak Coal Mining Co., Ld.	Sahado Dosadh, (m.), 35, <i>Coal cutter.</i>	Coal .	Whilst four persons were being lowered in the cage, the lugs of the front standards of the brake broke and the cage bumped violently at the bottom of the shaft. Deceased received injuries from which he died three hours later and three other men were severely injured. Inspection and inquiry made.
77	31st December, 8 A.M.	Srikrishnapur Mine, Kalipahari P. O., Bengal.	Baliram Coal Co.	Bhola Turi, (m.), 35, <i>Special pump khalasi.</i>	Coal .	Deceased was in the shaft oiling a pump. On signalling for steam to be shut off and for him to be raised the cage came up empty. He was afterwards found on the pump with his head smashed in. It is probable that owing to the steam escaping from a broken joint 6 or 7 feet above the pump he tried to get on to the side of the cage from the pump staging and fell off as he was being pulled up. Inspection and inquiry made.
Falling into the shaft from the surface—(1 death).						
78	16th July, 11-30 A.M.	Loyabad Mine, Bansjora P.O., Bihar and Orissa.	Barakar Coal Co., Ld.	Behari Kurmi Mahato, (m.), 25, <i>Fitter-mistri.</i>	Coal	A 12" x 6" Tangye pump was about to be lowered down the pit and was balanced on the wall of the inset. Deceased was on the pump loosening a rope. The pump by some means or other slipped off the inset wall and swung across the shaft and deceased was thrown to the shaft bottom, 200 feet below, and was killed instantaneously. The pump should have been secured before any one was allowed on to it. Inspection and inquiry made.
Falling from part of the way down—(3 deaths.)						
79	27th July, 1 P.M.	Munsar Mine, Kamptee P. O., Central Provinces.	Central Provinces Prospecting Syndicate, Ld.	Dhamia Mahar, (m.), 16, <i>Coolie.</i>	Manganese.	Orders had been given to stop work at the bottom of the winze where a cross cut was being driven. All the men had accordingly come up and brought their tools out when deceased went down again presumably to fetch something. He did not take a light and seems to have fallen off the sollar at the 50' level and into the sump 50' below; he pulled himself out of the sump on to the sollar and shouted for help and was carried up but died two days after from internal injuries and shock. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1913—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—contd.						
Falling from part of the way down—contd.						
80	5th October, 8 A.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Noor Mahomed, (m.), 18, <i>Carpenter's coolie.</i>	Coal	As deceased was getting into a train of tubs at a landing at the end of his shift, he slipped and fell between the edge of the landing and the train, a space of only 8 inches, and fell 180 feet down the incline which dips at 50°. He died immediately. Inspection and inquiry made.
81	16th October, 8-15 P.M.	Panchgatchia Mine, Sitarampur P. O., Bengal.	Lutchipur Coal Co., Ld.	Jagat Singh, (m.), 27, <i>Head-tindal.</i>	Coal	A balance weight and chain had become entangled with a water bucket in a shaft, at a depth of 200 feet. Deceased while endeavouring to set free the chain lost his balance and fell down between the bucket and the side of the shaft into water, 65 feet below. His body was recovered four days later. Inspection and inquiry made.
Things falling from part of the way down—(10 deaths).						
82	20th April, 3 P.M.	Simlabahal Mine, Jharia P. O., Bihar and Orissa.	Bhargora Coal Co., Ld.	Meghu Gope, (m.), 25, <i>Sinker.</i>	Coal	Two stones, about 1' x 6" x 3", fell from a shale band 3½' thick, at a distance from the pit bottom of 14 feet and struck deceased on the head, killing him outright. Another man was injured but recovered. The shale was very weak and should have been secured. Inspection and inquiry made.
83	10th June, 1-30 A.M.	Rakha Hills Mine, Rakha Mines P. O., Bihar and Orissa.	Cape Copper Co., Ld.	Gobindswami, (m.), 28, <i>Machine-drill man.</i>	Copper	The loaded skip came off the skipway at a depth of 294 feet and knocked out a hand rail between the ladder way and skip way. This hand rail, 15' long x 6" x 1", fell or slid down the ladder way, at an angle of 42°, right to the bottom of the shaft, 300 feet below, and struck deceased, who was working there, on the back of the head, killing him instantly. Inspection and inquiry made.
84	28th September, 4-30 P.M.	Sripur Mine, Kalipahari P. O., Bengal.	Lodna Colliery Co., Ld.	Abdul Meah, (m.), 32, <i>Sinker.</i>	Coal	Deceased was hit by a stone about a foot square and six inches thick, which fell somewhere from the side of a shaft, which was 850 feet deep. There was no particularly weak layer of strata. The strata were sound generally. Inspection and inquiry made.
85	15th November, 7-15 A.M.	Bhowra Mine, Jamadoba P. O., Bihar and Orissa.	Eastern Coal Co., Ld.	Kari Meah, (m.), 25, Dowlat Meah, (m.), 25, Gurdoyal Singh, (m.), 35, <i>Bailers.</i>	Coal	While five bailers were at work at the bottom of a shaft 326 feet deep a block of coal, measuring 8' x 7' x 6' 6", fell from a middle landing, situated 214' from the surface. The greater portion of the coal fell down the shaft and killed the three deceased outright. Inspection and inquiry made. See Report, page 10.
86	9th December, 4 P.M.	Hariladhi Mine, Jharia P. O., Bihar and Orissa.	Equitable Coal Co., Ld.	Kherku Kahar, (m.), 18, Namdin Khan, (m.), 25, <i>Tindal khalasi.</i>	Coal	A column of loose flanged wrought iron pipes, 5" in diameter, and about 100' in length, was being raised under water, between a double line of buntons in a shaft by means of a rope attached to the top pipe and to a hand winch which was actuated by three men. This was the first time that such a

87	11th December, 2-30 P.M.	Balaghat Mine, Kamptee P. O., Central Provinces.	Central Provinces Pros- pecting Syn., Ltd.	Brijlal Lodi, (m.), 35, <i>Shaft-worker.</i>	Manganese .	and the column fell back, striking the two deceased, who were standing on the highest buntion in order to guide the pipe up, and throwing them into the water. 195' deep, just below the buntion. Namdin Khan's body was recovered three days afterwards and Kherku Kahar's body was recovered five days afterwards. A pump man was also thrown into the water but was rescued. Inspection and inquiry made.
88	17th December, 9 P.M.	Sripur Mine, Kalipahari P. O., Bengal.	Lodna Colliery Co., Ltd.	Ramu Kol, (m.), 23, <i>Sinker.</i>	Coal .	While a bucket containing drills was being wound up a shaft it collided (probably with the descending bucket) and caught in the side. A small drill tipped out and fell to the bottom of the shaft and struck deceased in the back piercing his lung. He died from shock five days later. Inspection and inquiry made.
SUFFOCATION BY GASES—(1 death).						
89	10th November, 4 P.M.	Sanctoria Mine, Dishargarh P. O., Bengal.	Bengal Coal Co., Ltd.	Alumuddy, (m.), 13, <i>Pump-khalasi's assistant.</i>	Coal .	A stone, 24" x 16" x 5", fell somewhere from the side of a shaft which was 910 feet deep, and struck deceased on the head killing him instantly. A similar fatality had occurred at this shaft about two months previously. Inspection and inquiry made. <i>See Report, page 11.</i>
EXPLOSIVES—(2 deaths).						
90	2nd March, 10 A.M.	Pntletto Mine, Tavoy P. O., Lower Burma.	Kho Jin Teik, Tavoy P. O.	Ah Yan, (m.), 40, <i>Coolie.</i>	Wolfram .	A fire broke out in an old goaf into which it is presumed deceased penetrated having gone over a fence. He was gassed and died from the effect of carbon monoxide poisoning. The area was dammed off by walls, which had been damaged by fall of roof during the rains and a second line of stopping had been nearly completed. Inspection and inquiry made.
91	10th December, 9-30 A.M.	Budruhak Mine, Sijua P. O., Bihar and Orissa.	Budruhak Coal Mining Co., Ltd.	Sital Passi, (m.), 33, <i>Shot-firer.</i>	Coal .	Deceased was head of a gang of three men who worked in an open cut. He appears to have attempted to pull out the fuse and detonator from a miss-fired charge of dynamite. Whilst doing so it exploded and blew off one of his hands. He died in hospital a month later. Inquiry made.
IRRUPTIONS OF WATER OR FALLING INTO WATER—(30 deaths).						
92	28th June, 2 A.M.	Jotejannki Mine, Chowkidanga P. O., Bengal.	Banerji Santan	Charu Manjhi, (m.), 16, <i>Miner.</i> Khepi Manjhian, (f.), 50, Alhadi Manjhian, (f.), 14, Rani Manjhian, (f.), 15, Hupni Manjhian, (f.), 16, Thelka Manjhian, (f.), 16, Takra Manjhian, (f.), 40, Sohagi Manjhian, (f.), 50, Joshi Manjhian, (f.), 14, Loghni Manjhian, (f.), 15, Khodu Manjhian, (f.), 14, Muni Manjhian, (f.), 36, Manki Manjhian, (f.), 35, <i>Kamins.</i>	Coal .	Owing to an abnormal fall of rain which commenced about 10 P.M. and lasted for about five hours, during which time from 7 to 8 inches of rain fell, the water in a nullah flowing past the mine rose above the mouths of two inclines and completely flooded all the workings, drowning the thirteen deceased. The management declared that they were unaware that any one was underground that night. Inspection and inquiry made. <i>See Report, page 13.</i>

APPENDIX II—*contd.*

Fatal Accidents, 1913—*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.
IRRUPTIONS OF WATER OR FALLING INTO WATER—<i>contd.</i>						
93	21st July, 8 A.M.	Sikdardih Mine, Giridih P. O., Bihar and Orissa.	Bayra Coal Association	Chaku Rai, (m.), 30, Bhola Rai, (m.), 20, <i>Pump khalasies.</i>	Coal	Owing to a very heavy rainfall, nearly 7 inches, which fell in a few hours in the night, the flood level of the Sikli and Khaku nullahs rose to such a height that the water flowed down the mouth of the incline which was situated on the banks of the nullah and filled the mine. Deceased who were looking after the pump were caught below and drowned. Inspection and inquiry made.
94	7th August, 8 P.M.	Jamadoba Mine, Jamadoba P. O., Bihar and Orissa.	Indian Collieries Syndicate, Ld.	Moti Meah, (m.), —, Bishu Meah, (m.), —, Gorhali Meah, (m.), —, Mirju Meah, (m.), —, Milu Singh, (m.), —, Bhagu Roy, (m.), —, Laku Manjhi, (m.), —, <i>Main gallery drivers.</i>	Coal	After about four days of very heavy rain the water rose at the bottom of a shaft until it reached the mouth of the level in which deceased were working, and it was subsequently ascertained by levelling that their retreat was nearly cut off at 10 P.M., when all responsible officials including the manager left the mine. Some time during the night the water from a nullah broke into a main gallery and completely flooded large areas of the mine including this level. It is probable that deceased's escape was completely cut off before the nullah water broke in. Inspection and inquiry made. <i>See Report, page 13.</i>
95	8th August, 2-30 A.M.	Bhatdih Mine, Mohoda P. O., Bihar and Orissa.	Bengal Bhatdih Coal Co., Ld.	Caraku Rajwar, (m.), 42, Arjun Rajwar, (m.), 36, Charku Meah, (m.), 35, Goju Mahato, (m.), 40, Kongla Mahato, (m.), 45, <i>Coal-cutters.</i> Uttim Gope, (m.), 26, Anup Gope, (m.), 22, <i>Main heading drivers.</i>	Coal	After about four days of very heavy rain the river Damuda, which flows past the inclines of the mine, rose to such a height that at some time on the night of the 7th/8th August it overflowed into the inclines and flooded the workings in which nineteen persons were at work. Of these twelve were rescued, but the retreat of the seven deceased was cut off and they were drowned. Inspection and inquiry made. <i>See Report, page 14.</i>
96	16th August, 7-30 A.M.	Kusunda Mine, Kusunda P. O., Bihar and Orissa.	Patel & Co.	Gandhari Bhuia, (m.), 20, <i>Coolie.</i>	Coal	Deceased was sitting on a ledge in a quarry, below which there was 7' of water, washing his face. He was heard splashing in the water, and an alarm was raised. He was recovered, but artificial respiration applied for over an hour failed to resuscitate him. Inspection and inquiry made.
HAULAGE—(16 deaths.)						
97	21st February, 10 P.M.	Jogta Mine, Sijua P. O., Bihar and Orissa.	Agabeg Brothers	Ramjan Meah, (m.), 45, <i>Trammer.</i>	Coal	The deceased, whilst riding on a loaded train, against orders, fell off and was run over sustaining injuries from which he died a week later. Inspection and inquiry made.
98	26th February, 3 A.M.	Dumarkunda Mine, Chirkunda P. O., Bihar and Orissa.	Bengal Coal Co., Ld.	Lokhoo Manjhi, (m.), 22, <i>Miner.</i>	Coal	Deceased was riding, against orders, on a full set of tubs which were being drawn out of the incline. The set ran off the road and deceased was crushed so badly between the set and a prop that he died two hours later. Inspection and inquiry made.

99	22nd March, 3-30 P.M.	Borra Mine, Sitarampur P. O., Bengal.	New Birbhum Coal Co., Ld.	Kalu Manjhi, (m.), 16, <i>Trammer.</i>	Coal	Deceased was pushing an empty tub and when passing a full tub his foot was caught under it and he sustained a compound fracture of the foot. He died on the 6th April.
100	18th May, 9 A.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Sohnu, (m.), 23, <i>Coolie.</i>	Coal	A mistri and a carpenter, after loading a tub with timber on the surface, pushed it over the brow without attaching the rope and without seeing that the safety catch block was in position. The tub ran wild and one of the timbers struck deceased, who was one of a gang of four at work cleaning the main dip, about 50 feet from the top. Deceased's thigh was broken and he died from shock about ten hours later. Inspection and inquiry made.
101	5th June, 10 P.M.	Tikak Upper Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ld.	Baktu Bahadur, (m.), 45, <i>Tub-pusher.</i>	Coal	Whilst deceased was coupling up tubs at a siding another tub was pushed into the siding and by some means he got his leg between the tubs. He received a deep cut on the inside of the leg, and two months later the limb was amputated. He succumbed on the day after the operation. Inspection and inquiry made.
102	10th June, 1 A.M.	Titilmuri Mine, Sijua P. O., Bihar and Orissa.	Titilmuri Collieries, Ld.	Ramtahal Bhuia, (m.), 38, <i>Onsetter.</i>	Coal	Deceased and another, while waiting for the empty set of tubs to come down the incline, lay down and went to sleep by the side of the road, and were caught by seven tubs which ran wild from the top of the incline owing to a link breaking. Deceased was killed and the other man was injured. If the runaway switch had been open, as it should have been, the tubs would not have run down the incline. Inspection and inquiry made. <i>See Report, page 15.</i>
103	3rd August, 1 A.M.	Lakorka Mine, Katrasgarh P. O., Bihar and Orissa.	Lakorka Coal Co., Ld.	Jogin Patwar, (m.), 35, <i>Hookman.</i>	Coal	While a set of twelve empties was being pushed over the brow on to the slope seven ran wild down the incline and struck deceased who was sitting on the roadside, evidently asleep. The catch siding was not sufficiently far down below the brow to allow the full set to come on to it before closing, and consequently it had to be closed before it could be definitely ascertained if the couplings were in order or not. Inspection and inquiry made. <i>See Report, page 15.</i>
104	3rd August, 12-30 P.M.	Barari Mine, Jamadoba P. O., Bihar and Orissa.	East Indian Coal Co., Ld.	Prom Meah, (m.), 30, <i>Sirdar.</i>	Coal	While a set of empties was being lowered down the incline, the head tubman signalled to stop the set, and on being stopped, the bottom tub by some means or other became detached and ran down the incline as far as No. 11 level where it derailed and struck deceased who was on the roadside. He died within half an hour. Inspection and inquiry made.
105	9th September, 9-30 A.M.	Kondwadih Mine, Kusunda P. O., Bihar and Orissa.	East Indian Coal Co., Ld.	Nazir Meah, (m.), 15, <i>Gate boy.</i>	Coal	A hauling rope broke and a set of tubs ran wild, running over deceased who had left his door and was standing at the bottom of the haulage plane. He died in two hours. The rope appeared to be in poor condition. Inspection and inquiry made.
106	18th September, 8-30 P.M.	Bhaga Mine, Jharia P. O., Bihar and Orissa.	Jharia Colliery Co., Ld.	Hari Rajwar, (m.), 32, <i>Minor.</i>	Coal	The tubs at this colliery are fitted with a special form of drawbar made of 1" flexible wire rope and fastened under the floor of the tub by means of two staples. While a set of five loaded tubs was being drawn up, the drawbar of the front one broke at the point it was clipped by the staple. The set ran back and the last tub struck deceased causing injuries from which he died. There was a hook bar or "Monkey" fixed on the last wheel, but it did not act as it was of a bad design. Inspection and inquiry made.
107	22nd September, 8 A.M.	Ekra Khas Mine, Bansjora P. O., Bihar and Orissa.	Maharaja M. C. Nandi	Munshi Bilaspuri, (m.), 45, <i>Minor.</i>	Coal	A set of eight tubs was pushed on to the incline, the last two being uncoupled. The hookman, at the lever working the safety catch which catches the tub's axle in the event of a runaway and upsets it, lost his head and held the lever tight allowing the tubs to run down. The tubs after running down about 100 yards jumped the rails and struck deceased breaking his femur. He died three days later from shock. The accident was due to the carelessness of the hookmen who were fined a week's pay. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1913—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.						
108	29th September, 5-30 P.M.	Borachak Mine, Sitarampur P. O., Bengal.	Umesh Chandra Mukherji.	Singha Manjhian, (f.), 60, <i>Miner's kamin.</i>	Coal	Deceased was carrying down food for her husband when she was knocked down by a set of empty tubs sustaining injuries from which she died in three hours. She was without a light. If she had had one she would have been able to get out of the road. Inspection and inquiry made.
109	18th October, 10-30 A.M.	Rampur Mine, Jharsaguda P. O., Bihar and Orissa.	Hingir Rampur Coal Co., Ld.	Palan Bhuia, (m.), 25, <i>Tub-pusher.</i>	Coal	Two empty tubs ran wild on a haulage plane owing to the haulage man neglecting to attach a coupling before lowering the tubs. The tubs struck deceased who sustained injuries from which he died six hours later. He was standing in the haulage road against orders and was warned by the bell man to go away.
110	25th October, 3 P.M.	Madhubpur Mine, Ondal P. O., Bengal.	Imperial Coal Co., Ld.	Magram Bauri, (m.), 20, <i>Coal cutter.</i>	Coal	Deceased was run into by a full tub which had been pushed out by a miner towards the pit and allowed to run loose by itself. He received injuries from the effects of which he died the next day. Inspection and inquiry made.
111	27th November, 10-15 A.M.	Kurkend Mine, Kurkend P. O., Bihar and Orissa.	Marino Coal Co., Ld.	Chohan Dhobi, (m.), 35, <i>Bailing coolie.</i>	Coal	Owing to the carelessness of a hookman an empty tub was allowed to run wild from the top of a haulage slope. Deceased, who was walking up the slope, was knocked down and received injuries from which he died some hours later. Inspection and inquiry made.
112	29th November, 3 P.M.	Tirap Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ld.	Babulal, (m.), 14, <i>Under-ground road cleaner.</i>	Coal	Deceased, whilst riding against orders on the coupling between two loaded tubs which were being hauled by a pony, fell off and was run over sustaining injuries from which he died the same day. Inquiry made.
SUNDRIES UNDERGROUND—(14 deaths).						
113	8th February, 3 P.M.	Huntodih Mine, Mohoda P. O., Bihar and Orissa.	Huntodih Coal Co., Ld.	Nanku Turi, (m.), 25, <i>Pillar cutting sirdar.</i>	Coal	About half a ton of coal fell from the side of a pillar which was being extracted and knocked out a prop, which hit deceased on the head. He was at first not considered to be seriously injured, but became unconscious during the night, and died at noon next day. Inspection and inquiry made.
114	11th March, 2 P.M.	Central Kurkend Mine, Kusunda P. O., Bihar and Orissa.	Central Kurkend Coal Co., Ld.	Sonia Manjhian, (f.), 16, <i>Coal carrier.</i>	Coal	Deceased was loading a self-tipping tub in a siding at a point too near the crossing leading to a parallel line, when another tub was pushed along the parallel line and collided with the tub she was loading. The body of the latter tub was overturned by the impact and its contents of coal fell upon her killing her on the spot. There were efficient catches to prevent overturning, but by some unknown means these had been raised. Inspection and inquiry made.

115	1st April, 7 P.M.	Pretoria Mine, Charanpur P. O., Bengal.	Sibpur Coal Co., Ld.	Felu Turi, (m.), 28, <i>Miner.</i>	Coal	Deceased left his working place and went to work at a pillar. He was removing a piece of overhanging coal, and as it came away, he stopped back, and tripped, and sat down on a sharp stone, dying fifteen minutes after being brought to the surface, from loss of blood and shock. On enquiry it was found that the subordinate officials had been very lax. Inspection and inquiry made.
116	8th April, 6 P.M.	Jamadoba No. 3 Mine, Jamadoba P. O., Bihar and Orissa.	Indian Collieries Syndi- cate, Ld.	Sambhu Manjhi, (m.), 45, <i>Miner.</i>	Coal	While dressing roof stone in a pillar working district and in the act of avoiding a dislodged piece, deceased slipped and fell back among the props, striking his back against one and breaking his spine. He died the following day. In- spection and inquiry made.
117	11th April, 11-30 A.M.	Junawani Mine, Kamptee P. O., Central Provinces.	Central India Mining Co., Ld.	Ganpat Dhankar, (m.), 28, <i>Coolie.</i>	Manganese	Deceased was cutting down a pillar of earth 15 ft. high left standing in an excavation for the purpose of measurement when it suddenly collapsed and a portion fell on him. He died eight hours afterwards. Inspection and inquiry made.
118	9th May, 11 A.M.	Aldih Mine, Sitarampur P. O., Bengal.	Aldih Coal Co., Ld.	Girish Bauri, (m.), 25, <i>Coal cutter.</i>	Coal	Deceased had come from his working place to talk with one of his gang and was sitting on a level by the side of a tub when a kamin came up from the dip side with a loaded basket of coal. She lost her light before reaching the level and stumbled and fell as she got on to the level and the basket of coal fell on to deceased's back and injured his spinal column. He died seven days afterwards. Inspection and inquiry made.
119	24th May, 1 P.M.	Mudidih Mine, Sijua P. O., Bihar and Orissa.	Reliance Coal Co., Ld.	Mahabir Chamar, (m.), 30, <i>Sirdar.</i>	Coal	A tub had run away the night before into the sump and had broken the sump boards. Deceased attempted next day to cross the pit on the sump boards which collapsed, precipitating him to the bottom of the sump 30 ft. below and killing him instantaneously. Inspection and inquiry made.
120	7th June, 1 A.M.	Khost Mine, Khost P. O., Baluchistan.	North Western Railway	Amir, (m.), 28, <i>Mine carpenter's coolie.</i>	Coal	Deceased appears to have gone to sleep while waiting for a coal cutter to finish cutting some coal in order to fix a prop in the face, and while asleep to have overbalanced himself and fallen between two kamani boards into the goaf below. He fell a distance of only 12 feet, and fractured his skull, death being instantaneous. He fell through a 2 feet hole left for throwing dirt into the goaf. Inspection and inquiry made.
121	6th July, 11 A.M.	Kantapahari Mine, Panuria P. O., Bengal.	Barakar Coal Co., Ld.	Kunja Moyra, (m.), 33, <i>In charge of friction roller.</i>	Coal	Deceased tried to cross the pit bottom and fell into the sump through an opening 5' x 4'. The sump was 2' 3" deep and contained boiling water. He was severely scalded and died the same evening from shock. There was a travelling road round the side of the shaft which he could have used but the sump should have been boarded over completely. Inspection and inquiry made.
122	18th July, 7-15 A.M.	Bhuskajuri Mine, Asansol P. O., Bengal.	Bhuskajuri Coal Co., Ld.	Jitu Ghatwal, (m.), 22, <i>Miner.</i>	Coal	Deceased slipped and fell while carrying a basket of coal in the mine. He sat down for an hour and then was brought out and died a quarter of an hour later. He had had fever for a month and was in a weak state of health and death was apparently due to heart failure caused by the shock of the fall. Inspection and inquiry made.
123	8th November, 8 A.M.	South Gobindpur Mine, Katrasgarh P. O., Bihar and Orissa.	South Gobindpur Collier- ies, Ld.	Sukri, (f.), 45, <i>Coal carrier.</i>	Coal	Deceased was travelling down an incline alone when her clothes caught fire at a flare lamp which she was carrying. Before aid could be summoned she was burnt all over the body, and died 41 hours later as a result of her injuries. Inspection and inquiry made.

APPENDIX II—*contd.*

Fatal Accidents, 1913—*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.
SUNDRIES UNDERGROUND—<i>concl'd.</i>						
124	9th December, 6-30 P.M.	South Kustore Mine, Kustore P. O., Bihar and Orissa.	Ranignnj Coal Association, Ld.	Bhim Singh, (m.), 35, Debi Singh, (m.), 28, <i>Coal cutters.</i>	Coal	The two deceased were driving a main dip gallery in which an electric motor and pump were situated. Whilst carrying out coal in a basket Debi Singh touched the suction pipes and was electrocuted. Bhim Singh rushed to his assistance and was similarly electrocuted. The accident was due to defective insulation coupled with inefficient earthing of the pump motor frame. Inspection and inquiry made.
125	23rd December, 9 P.M.	Khurhurbari Mine, Giridih P. O., Bihar and Orissa.	East Indian Railway Co.	Sobia Dosadhin (f.), 13, <i>Coal carrier.</i>	Coal	While carrying a basket of coal from a gallery to her tub deceased slipped upon the floor and fell backwards, striking her head on the floor with such violence that her skull was cracked. She died within a few minutes. Inspection and inquiry made.
Surface machinery—(1 death).						
126	31st March, 5-25 P.M.	Khost Mine, Khost P. O., Baluchistan.	North-Western Railway	Wali, (m.), 45, <i>Dust coolie.</i>	Coal	Deceased while crossing a shaft got his clothes entangled in a pulley wheel and was drawn round the shaft. He died two days later from internal injuries received. Inspection and inquiry made.
Surface boilers or pipes bursting—(2 deaths).						
127	27th March, 7-30 A.M.	Sripur Mine, Kalipahari P. O., Bengal.	Lodna Colliery Co., Ld.	Rama Dosadh, (m.), 35, Sheik Fasiulla, (m.), 32, <i>Fitters' coolies.</i>	Coal	The valve chest of a winding engine was blown to pieces by water hammer and the two deceased were so badly scalded by the escaping steam that one died in three hours and the other in ten hours. Inspection and inquiry made.
On surface railways and tramways belonging to the mine—(3 deaths).						
128	3rd May, 4 P.M.	Tikak Mine, Margherita P. O., Assam.	Assam Railways and Trading Co., Ld.	Bidu, (f.), 41, <i>Shunter.</i>	Coal	Deceased was crushed between two wagons while engaged in hand shunting operations. She sustained injuries from which she died next day. She had worked at the mine as a shunter for twelve years. Inquiry made.
129	29th September, 4 P.M.	Mayo Mine, Khewra P. O., Panjab.	Government of India	Rani, (f.), 65, <i>Coolie.</i>	Salt	Deceased had a load of earth on her head. She passed the line for the empty trucks, going between two of them, and as she got on to the other line a full truck ran over her. She sustained injuries from which she died next day.
130	27th October, 11 A.M.	Phularitand Mine, Katrasgarh P. O., Bihar and Orissa.	Phularitand Coal Co., Ld.	Ratni Bourin, (f.), 14, <i>Coal carrier.</i>	Coal	Deceased was pushing an empty tub over a bridge, only 2' 8" wide and 45' long, when she lost her balance and fell headlong over the side into the nullah below, a distance of 10' 6". She sustained concussion of the brain from the effects of which she died fourteen and a half hours later. Inspection and

Miscellaneous on surface—(6 deaths).

131	7th January, 8-30 P.M.	Kendwadih Mine, Kusunda P. O., Bihar and Orissa.	East Indian Coal Co., Ltd.	Budhan Doodh. (m.), 30, <i>Hookman.</i>	Coal .	Deceased's clothes caught fire owing to the upsetting of a kerosine oil lamp near a fire at the pit bank. He died the next day. It is probable that the accident was due to a struggle between the deceased and a sirdar. The manager saw deceased half an hour after the accident and found he was drunk. Inspection and inquiry made.
132	2nd April, 9 A.M.	Alkusa Mine, Kustore P. O., Bihar and Orissa.	Baniganj Coal Association, Ltd.	Giridhari Meah, (m.), 30, <i>Fitter's coolie.</i>	Coal .	Deceased was fixing up a wire on an electric wire post with another man, when the post snapped and the two men were thrown to the ground, deceased being killed by the fall. Inspection and inquiry made.
133	26th May, 2-10 P.M.	Jamadoba Mine, Jamadoba P. O., Bihar and Orissa.	Indian Collieries Syndi- cate, Ltd.	Annand Roy, (m.), 27, <i>Turner.</i>	Coal .	Deceased caught hold of the iron wire working the fast and loose pulleys of a lathe, and received an electric shock which killed him instantaneously. It was afterwards discovered that a leak had occurred through the failure of the insulation of a high tension wire carrying a current of 2,300 volts. Inspection and inquiry made.
134	3rd July, 10-30 A.M.	Chooling Mine, Maliwan P. O., Lower Burma.	Burma Development Syn- dicate, Ltd.	A. E. Kinghorn, (m.), 20, <i>Manager.</i>	Wolfram	Deceased who was the manager of the mine, while inspecting a break down on an electric tramway, touched a live electric wire charged with some 5,000 volts. He was killed instantaneously.
135	6th August, 5 P.M.	Titilmuri Mine, Sijua P. O., Bihar and Orissa.	Titilmuri Collieries, Ltd.	Puria Gope, (f.), 25, <i>Loading woman.</i>	Coal .	While loading a wagon with coal deceased slipped off the loading platform and injured her skull. Compression of the brain ensued, which caused death a few hours later. Inspection and inquiry made.
136	27th November, 2 P.M.	Bhaga Mine, Jharia P. O., Bihar and Orissa.	Jharia Colliery Co., Ltd.	Bhiki Goala, (m.), 27, <i>Tramway mistri.</i>	Coal .	Whilst deceased and other persons, including the head fitter, were repairing a steam joint under the winding engine, steam was inadvertently turned on at the boiler 50 feet away. He received severe scalds which resulted in death on the following day. The boiler fireman who turned on the steam was unaware that any persons were working on the steam range. Inspection and inquiry made.

APPENDIX II—contd.

Fatal Accidents, 1913—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—(39 deaths).							
1	6th February, 4-30 P.M.	Jamuria Mine, Nandi P. O., Bengal.	Equitable Coal Co., Ltd.	Thatu Manjhi, (m.), 11.	Coal .	Not employed	A full set was being formed on the main haulage road from No. 13 level and the front tub, which was evidently not spragged by the hookman, ran wild into the level and caught deceased who was standing by the side of the road in the dark as his light had gone out. His leg was broken and he died from shock two days later. Inspection and inquiry made.
2	18th February, 9 P.M.	Jamadoba Mine, Jamadoba P. O., Bihar and Orissa.	Indian Collieries Syndicate, Ltd.	Tulsi Mahato, (m.), 60, Screening plant coolie.	Coal .	Not a mining accident.	Two wagons were being brought by some coolies; deceased appears to have been pushing the first wagon when the second wagon came in contact with it crushing him between the buffers. Inspection and inquiry made.
3	22nd February, 11 A.M.	Kurkend Mine, Kurkend P. O., Bihar and Orissa.	Sudamdih Coal Co., Ltd.	Sumri Dhanuk, (f.), 30, Tub loader.	Coal .	Not a mining accident.	Deceased was crushed between the buffers of two railway wagons while attempting to cross the line when the engine was shunting.
4	2nd March, 3 P.M.	Sudamdih Mine, Bhujudih P. O., Bihar and Orissa.	Empire Coal Co., Ltd.	Amenni, (f.), 8	Coal .	Not employed	Deceased was engulfed in a surface subsidence caused by the sudden collapse of underground workings. Her body was not found. Inspection and inquiry made.
5	17th March, 7 P.M.	Joyrampur Mine, Jharia P. O., Bihar and Orissa.	Khengarji Triku & Co.	Barki, (f.), 2.	Coal .	Not employed	Some coolies' huts caught fire and deceased was burnt to death.
6	18th March, 1 A.M.	Damudapur Mine, Nandi P. O., Bengal.	Bengal Coal Co., Ltd.	Ranjit Manjhi, (m.), 8.	Coal .	Not employed	Deceased lay asleep about 20 feet away from the edge of a pillar at which miners were working. A miner wedged down a block of coal, 5' x 1' 6" x 1' 6", which, in falling, struck a roof post and knocked it out. The post fell on deceased, and fractured his skull. Since the accident children have not been allowed in the pillar cutting district at all. Inspection and inquiry made.
7	20th March, 9-30 A.M.	Budruchak Mine, Sijua P. O., Bihar and Orissa.	Budruchak Coal Mining Co., Ltd.	Goolbaise Goalin, (f.), 10.	Coal .	Not employed	Deceased presumably fell into an old incline mouth full of water to which she had gone to bathe with two infants, and in which her body was recovered some four days later. Inspection and inquiry made.
8	20th March, 3 P.M.	Laikdih Mine, Chirkunda P. O., Bihar and Orissa.	Bengal Coal Co., Ltd.	Atika Bauri, (m.), 35.	Coal .	Not employed	Deceased was cutting coal in an old quarry for his own use from under a stone band which had been left unsupported when a piece, 8' x 7' x 6", fell on him causing injuries to his spine, from the effects of which he died. He had no business to be working

9	3rd April, 9 A.M.	Salanpur Mine, Sitarampur P. O., Bengal.	Borrea Coal Co., Ltd.	Guli Roy, (m.), 55, <i>Coolie.</i>	Coal .	Not a mining accident.	An iron roller was being taken from one part of the colliery to another. At the place of the accident there was a sharp dip in the road and the contractor in charge having only fifteen men to pull the roller gave orders to let go and allowed it to run by itself down the slope. As every one let go, the handle swung up and caught deceased on the head fracturing his skull. Inspection and inquiry made.
10	8th April, Unknown.	Charanpur Mine, Charanpur P. O., Bengal.	Apcar & Co.	Ram Prosad Lal, (m.), 6.	Coal .	Not employed	Deceased was staying in some peons' quarters with his father and evidently wandered away and fell into the boiler feed water tank, 7' deep, while his father was asleep in the afternoon. His body was found next morning by a pump khalasia. The tank was securely fenced. Inspection and inquiry made.
11	17th April, 11-30 A.M.	West Ghusik Mine, Kalipahari P. O., Bengal.	West Ghusik Coal Concern	Anath Bauri (m.), 10 months.	Coal .	Not employed	Deceased was thrown down an abandoned mine shaft by her mother. The shaft being full of water the child was drowned. Inspection and inquiry made.
12	17th April, 12 Noon.	Lutchipur Mine, Sitarampur P. O., Bengal.	Lutchipur Coal Co., Ltd.	Ganesh Manjhi, (m.), 40, <i>Coal cutter ;</i> Sobi Baurin, (f.), 30, <i>Surface kamin.</i>	Coal .	Not a mining accident.	Deceased were employed inside a "dhowra" making country powder for a contractor, when the powder was set alight and they were so badly burned that they died from the effects. Either they or the contractor's agent were evidently smoking at the time. Inspection and inquiry made.
13	23rd April, 5 P.M.	Chandametta Mine, Pench P. O., Central Provinces.	Pench Valley Coal Co., Ltd.	Tulsidas, (m.), 4.	Coal .	Not employed	Deceased apparently had been collecting "mahowa" near the foot of a tree and wandered through a fence into a heap of heated ashes about 7" thick. He received burns about the feet, which caused him to fall and be burnt about the body. Death ensued on the third day from pneumonia said to have been brought on by the burns. Inspection and inquiry made.
14	14th May, 12 noon.	Madhubpur Mine, Ondal P. O., Bengal.	Imperial Coal Co., Ltd.	Niri Goalin, (f.), 30.	Coal .	Not employed	Deceased, who was the wife of one of the colliery carters and was not employed, tried to get on to a train of full tubs and missing her footing, fell between the tubs and was run over, death being practically instantaneous. Inspection and inquiry made.
15	9th June, 5 P.M.	Kankani Mine, Banajora P. O., Bihar and Orissa.	Eastern Coal Co., Ltd.	Durga Gope, (m.), 5.	Coal .	Not employed	Deceased, who was only aged 5, was subject to epileptic fits. He was missed about 4 P.M. and his body was found in a tank two hours later. Inspection and inquiry made.
16	15th June, 8-30 A.M.	Madhubpur Mine, Ondal P. O., Bengal.	Imperial Coal Co., Ltd.	Bawsingh Manjhi, (m.), 3.	Coal .	Not employed	Deceased fell into a small pool of water near a "dhowra" and was drowned. It is not known how he came to fall in. Inspection and inquiry made.
17	16th June, 12-30 P.M.	Napara Khas Mine, Asansol P. O., Bengal.	Maharaja M. C. Nandi	Somra Bhuia, (m.), 2.	Coal .	Not employed	Deceased was sitting with his parents under an East Indian Railway hopper wagon while they were having food. As it was a hot day they went under the wagon for shade. While there one of the bottom doors opened and the coal in the wagon, about 9 tons, poured down and buried deceased who was suffocated. Inspection and inquiry made.
18	21st June, 11 A.M.	Dheriajoba Mine, Kusunda P. O., Bihar and Orissa.	Dheriajoba Coal Co., Ltd.	Upasi Kaharin, (f.), 10, Sadai Kaharin, (f.), 8.	Coal .	Not employed	See remarks against No. 46 on page 45.

APPENDIX II—*concl.*

Fatal Accidents, 1913—*concl.*

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—<i>concl.</i>							
19	22nd June, 5-30 P.M.	Kankani Mine, Bangjors P. O., Bihar and Orissa.	Eastern Coal Co., Ltd.	Chinta Bhuiani, (f), 25.	Coal .	Not employed	Deceased fell into an old sump 13' deep at the bottom of a tank, out of which the water had been drained. The sump was full of mud, and deceased's body disappeared beneath it and so was not seen at the time of the occurrence. Inspection and inquiry made.
20	23rd June, 2 P.M.	Serampur Mine, Giridih P. O., Bihar and Orissa.	East Indian Railway Co.	Batulan Johlin, (f), 10.	Coal .	Not employed	Deceased, with a number of other children, moved a metre-gauge low-side wagon which was standing in the siding. She fell off one of the buffers on which she was riding and the wheel of the wagon passed over her head, crushing it.
21	6th July, 8 A.M.	Bhutgoria Mine, Jamadoba P. O., Bihar and Orissa.	Aldih Coal Co., Ltd.	Tejoya Kurmi, (m.), 2.	Coal .	Not employed	Deceased was playing on the endless haulage tram line when some tubs ran over his leg. He sustained a compound fracture of the right leg and died a week afterwards, death probably being hastened by chronic dysentery.
22	19th July, 7 A.M.	Akharia Mine, Ganwan P. O., Bihar and Orissa.	Allam Salim . . .	Bhichhero Mian, (m.), 45.	Mica .	Not a working mine.	Deceased was stealing mica from a disused mine, when the roof suddenly collapsed and killed him.
23	24th July, 7-30 P.M.	Serampur Mine, Giridih P. O., Bihar and Orissa.	East Indian Railway Co.	Amrit Chamar, (m.), 20, Coal cutter.	Coal .	Not a mining accident.	In attempting to get on to one of the loaded wagons which were being drawn out of the siding by the broad gauge engine, deceased slipped and fell on to the rails and was killed instantly.
24	4th August, 8 A.M.	Dendwa Mine, Sitarampur P. O., Bengal.	New Manbhurn Coal Co., Ltd.	Ram Prosad Nunia, (m.), 2.	Coal .	Not employed	Deceased was found in a pool of water, 1' 8" deep at the deepest point, by his father, where he had evidently fallen in while playing about.
25	14th August, 10 A.M.	Miragpur Mine, Kamptee P. O., Central Provinces.	Central India Mining Co., Ltd.	Itwari, (f), 2½.	Manganese .	Not employed	Deceased who had been left at home by her parents in charge of a sister, seven years old, wandered on to the tram line and was knocked down by a tub pushed by two men. Her skull was smashed and death was instantaneous. Inspection and inquiry made.
26	27th August, 6-30 A.M.	Balaghat Mine, Balaghat P. O., Central Provinces.	Central Provinces Pro- specting Syndicate, Ltd.	Bibla Pardhan, (f), 5	Manganese .	Not employed	A stone about 1lb. in weight was blown 520 feet from a shot hole and hit deceased on the head fracturing her skull from which she died about half an hour later. The explosive used was said to be only a normal charge of country gunpowder, which makes it a very extraordinary occurrence. Inspection and inquiry made.

27	30th August, 6 A.M.	Banksimulla Mine, Charanpur P. O., Bengal.	Bengal Coal Co., Ld.	Chand Ray Manjhi, (m.), 35, Miner.	Coal .	Not a mining accident.	Deceased was making country powder into cartridges in his house. The powder appears to have been ignited by a small miner's lamp which was burning in the house, and deceased was burnt about the body. He died four days later from shock. Inspection and inquiry made.
28	5th September, Between 12 & 6 P.M.	Sibpur Mine, Charanpur P. O., Bengal.	Katras Jharia Coal Co., Ld.	Samchar Kol, (m.), 7.	Coal .	Not employed	The body of deceased was found floating in a tank, 100' x 50', which was used for bathing. Inspection and inquiry made.
29	3rd October, 5:15 P.M.	Chowrasi Mine, Dishargarh P. O., Bengal.	Equitable Coal Co., Ld.	Sambha Bauri, (m.), 12, Goat herd.	Coal .	Not employed	Deceased was knocked down by a loaded tub while crossing the railway line after his goats. He died from shock.
30	9th October, 10 A.M.	Jinagora Mine, Jharia P. O., Bihar and Orissa.	M. Kumarji Vasta & Co.	Sogamani Napit, (f.), 15.	Coal .	Not employed	Deceased, who was employed at a neighbouring mine, was drowned in a quarry 100' x 30' x 28' deep. It is not known how she came to be drowned. Inspection and inquiry made.
31	10th October, 5-35 A.M.	Sanctoria Mine, Dishargarh P. O., Bengal.	Bengal Coal Co., Ld.	Raghu, (m.), 55, Coupling khalasi.	Coal .	Not a mining accident.	While coupling up wagons deceased was caught between the buffers and crushed to death.
32	23rd October, 7 A.M.	Sowardih Mine, Bhujudih P. O., Bihar and Orissa.	Sowardih Coal Co. .	Rosool Bibi, (f.), 10, Picking coolie.	Coal .	Not a mining accident.	Several coolies were hand shunting a wagon on a siding when deceased was run over. She sustained a lacerated wound on the right forearm and the elbow joint was split. She was sent to Dhanbaid Hospital where she succumbed to her injuries three days later. Inspection and inquiry made.
33	23rd October, 8 A.M.	Pootki Mine, Bansjora P. O., Bihar and Orissa.	Eastern Coal Co., Ld.	Bisnu Nunia, (m.), 11.	Coal .	Not employed	While washing cooking utensils at the edge of an unprotected feed water tank, measuring 8' 9" x 7' 9" x 4' 0" deep, deceased must have overbalanced and fallen in. His body was recovered shortly afterwards. The provision of a fence wall would have prevented the accident. Inspection and inquiry made.
34	26th November, 10 A.M.	Tramway at Tirodi, Kamptee P. O., Central Provinces.	Central India Mining Co., Ld.	Amani, (f.), 8.	Manganese	Not employed	Deceased was drawing water from a well when her foot got entangled with the rope attached to the bucket of water and this caused her to fall into the well; when got out after about 25 minutes life was extinct. Inspection and inquiry made.
35	18th December, Not known.	Gangutia Mine, Dishargarh P. O., Bengal.	Bengal Nagpur Coal Co., Ld.	Not known, (m.), 25?	Coal .	Not employed	On dewatering a shaft deceased's body was found in the sump in a state of nudity. A piece of cloth containing Rs. 13 was securely tied round the head. It was evident from the injuries that deceased either fell or was thrown down the shaft. It was suspected that murder was the cause and the case was left in the hands of the police. The shaft top was properly fenced. Inspection and inquiry made.
36	19th December, 5 P.M.	Ranadanga Mine, Charanpur P. O., Bengal.	Economic Coal Co., Ld.	Mani Manjhian, (f.), 50, Kamin.	Coal .	Not employed	Deceased presumably slipped by accident and fell down a well and was drowned. No one saw the accident. The well was fenced, but deceased was in the habit of drawing water from there as it was close to the "dhowra" in which she lived. Inspection and inquiry made.
37	20th December, 10 P.M.	Pretoria Mine, Charanpur P. O., Bengal.	Sibpur Coal Co., Ld.	Sukhu Kol, (m.), 3.	Coal .	Not employed	Deceased who was left by his parents in "dhowra" with his elder brother, upset a small pit lamp and was very badly burnt. He died from shock. 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 1913.

PROVINCE.	District and mineral field.	Total average number of persons employed daily.	FATAL ACCIDENTS.			SERIOUS ACCIDENTS.			DEATH-RATE IN 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 ground.	Above ground.		Total deaths.	Below ground.			Above ground.	Total number of persons injured.
A.—COAL.												
Bihar and Orissa	Hazaribagh. { Bokaro- Ramgarh. Giridih . Jharua .	184	...	...	...	2	3	...	3	...	...
		8,328	8	4	...	4	11	9	2	11	78	...
		176	...	...	...	...	...	...	...	...	...	...
	Manbhum, Jharua	71,244	84	78	6	84	50	37	14	51	176	22
	„ Raniganj	6,098	4	30	...	30	5	5	...	5	725	...
	Sonthal Parganas, Raniganj	26	...	...	...	...	...	...	...	...	...	...
	„ Rajmahal	54	...	...	...	...	...	...	...	...	...	...
	Palamanu, Daltonganj	773	...	...	...	...	1	...	1	1	...	...
Sambalpur, Hingir-Rampur	489	1	1	...	1	...	...	...	...	304	...	
	TOTAL	67,362	72	113	6	119	69	54	17	71	206	18
Bengal	Bankura, Raniganj	71	...	...	...	...	...	...	...	...	...	...
	Birbhum „	85	...	...	...	...	...	...	...	...	...	...
	Burdwan „	38,447	27	41	2	43	45	41	7	48	168	15
	TOTAL	38,553	27	41	2	43	45	41	7	48	168	15
Central Provinces	Chhindwara, Pench Valley	832	1	6	...	6	4	2	2	4	977	...
	Narsinghpur, Mohpani	1,178	...	...	...	...	3	3	...	3	...	...
	Chanda, Ballarpur	674	...	...	...	...	2	2	...	2	...	...
	TOTAL	2,684	1	6	...	6	9	7	2	9	321	2
Panjab	Jhelum	848	1	1	...	1	5	5	...	5	171	...
	Shahpur	46	...	...	...	...	...	...	...	...	...	...
	TOTAL	892	1	1	...	1	5	5	...	5	168	1
Assam	Lakhimpur	2,458	10	9	1	10	35	21	4	25	543	125
Baluchistan	Palan	16	...	...	...	...	...	...	...	...	...	...
	Kalat	10	...	...	...	...	...	...	...	...	...	...
	Quetta-Fishin	101	...	...	...	...	...	...	...	...	...	...
	Sibi, Khost, etc.	923	5	4	1	5	12	10	2	13	660	815
	Loralai, Loralai	37	1	1	...	1	...	...	...	...	4545	27
	TOTAL	1,087	6	5	1	6	12	10	2	12	702	267
North-West Frontier Province.	Hazara	6	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (COAL)	133,042	117	175	10	185	165	138	32	170	208	21

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 1913—contd.

Provinces.	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.
B.—MICA.													
Bihar and Orissa	Monghyr	447	...	...	...	...	...	...	...	...	...
	Hazaribagh	10,008	...	...	...	4	5	...	5	...	...
	Gaya	1,827	...	...	...	...	...	...	...	...	...
	Sonthal Parganas	32	...	...	...	...	...	...	...	...	...
	TOTAL	12,314	...	...	...	4	5	...	5	...	...
Madras	Coimbatore	82	...	...	...	...	...	...	...	...	...
	Nellore	5,719	...	...	...	...	...	...	...	...	...
	Salem	251	...	...	...	1	1	...	1	...	...
	TOTAL	6,002	...	...	...	1	1	...	1	...	...
Rajputana	Ajmer	317	...	...	...	...	...	...	...	...	...
	Merwara	101	...	...	...	...	...	...	...	...	...
	TOTAL	418	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (MICA)	18,734	...	...	...	5	6	...	6	...	...
C.—MANGANESE.													
Central Provinces	Nagpur	3,524	3	3	...	3	1	...	1	1	1.1685
	Bhandara	1,280
	Balaghat	4,656	2	2	...	2	4	3	2	5	.4943
	Chhindwara	714	1	...	1	1
	TOTAL	10,174	5	5	...	5	6	3	4	7	.6149
Madras	Vizagapatam	2,589	1	2	...	2	1	...	1	2	.9077
Bombay	Panch Mahals	1,197	5	1	4	5
	GRAND TOTAL (MANGANESE)	13,960	6	7	...	7	12	4	9	13	.6250
D.—LIMESTONE.													
Central Provinces	Jabalpur-Katni	2,677	1	1	...	1	2	2	...	2	.4937
Panjab	Hoshiarpur	68
	GRAND TOTAL (LIMESTONE)	2,745	1	1	...	1	2	2	...	2	.4836
E.—SALT.													
Panjab	Shahpur	34
	Jhelum	840	1	...	1	1	4	2	3	5	...	20.41	1.19
	Mianwali	58
	GRAND TOTAL (SALT)	932	1	...	1	1	4	2	3	5	...	20.41	1.07

APPENDIX II—contd.

Table No. 2—conold.

Statement of fatal and serious accidents in and about mines regulated by the Indian
Mines Act, 1901, during the year 1913.

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.														
Madhya Pradesh	Singhbhum	1,215	1	1	...	1	2	1	1	2	2.45	...	...	...	82	
		N.—FULLER'S EARTH.														
Central Provinces	Jabalpur	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		O.—CLAY.														
Madhya Pradesh	Palamu	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Central Provinces	Jabalpur	181	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bihar	Dolha	130	1	1	...	1	...	...	...	...	15.38	...	...	...	7.69	
Madras	Nellore	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (CLAY)	880	1	1	...	1	...	...	...	...	4.93	...	...	...	3.03	
		P.—GALENA.														
Madras	Mandalay	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Central Provinces	Drug	42	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Madras	Kurnool	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (GALENA)	42	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Q.—TIN.														
Madhya Pradesh	Hazaribagh	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Madras	Mergui (Maliwan)	† ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Tavoy	130	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (TIN)	142	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		R.—STEATITE.														
Central Provinces	Jabalpur	102	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Madras	Kurnool	214	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (STEATITE)	316	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		S.—GRAPHITE.														
Madras	Ramanad	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		T.—CORUNDUM.														
Madras	Trichinopoly	144	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		U.—SAMARSKITE.														
Madras	Nellore	† ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	GRAND TOTAL (ALL MINERALS)	181,260	136	199	12	211	201	161	48	209	1.71	...	...	...	...	1.16

† Figures included with those for Limestone.
† " " " " " Wolfram.
† " " " " " Mica.

APPENDIX II—contd.

Table No. 3.

Statement of fatal accidents in mines regulated by the Indian Mines Act, 1901, during the year 1913, 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 GROUND.	
			BELOW GROUND.				ABOVE GROUND.					
			Adult males.	Adult females.	Children (under 13).	TOTAL.	Adult males.	Adult females.	Children (under 13).	TOTAL.		
COAL	Baluchistan	6	5	...	...	5	1	...	...	1	6
	Bihar and Orissa. {	Giridih	8	3	1	...	4	4
		Jharis	64	67	11	...	78	4	2	...	6	84
		Raniganj	4	23	7	...	30	30
		Sambalpur	1	1	1	1
	TOTAL BIHAR AND ORISSA	72	94	19	...	118	4	2	...	6	119	
	Bengal- Raniganj	27	25	16	...	41	2	...	...	2	43
	Central Provinces	1	6	...	...	6	...	...	...	...	6
	Eastern Bengal and Assam	10	8	1	...	9	...	1	...	1	10	
	Panjab	1	1	...	...	1	...	...	...	...	1
TOTAL COAL	117	139	36	...	175	7	3	...	10	185		
MANGANESE	Central Provinces	5	5	...	...	5	...	...	...	...	5
	Madras	1	1	1	...	2	...	...	...	...	2
	TOTAL MANGANESE	6	6	1	...	7	...	...	...	...	7
LIMESTONE	Central Provinces	1	...	...	1	1	...	...	...	...	1
SALT	Panjab	1	...	...	...	...	1	...	...	1	1
GOLD	Madras	3	9	...	...	9	...	...	...	...	9
WOLFRAM	Burma	6	5	...	...	5	1	...	...	1	6
COPPER	Bihar and Orissa	1	1	...	...	1	...	...	...	...	1
CLAY	Delhi	1	1	...	...	1	...	...	...	...	1
GRAND TOTAL, ALL MINERALS		136	161	37	1	199	8	4	...	13	211	

APPENDIX II—concl'd.

Table No. 4.

Statement of fatal accidents in mines regulated by the Indian Mines Act, 1901,
during the year 1913, 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-damp.	Falls of roof.	Falls of side.	In shafts.	Suffocation by gases.	By explosives.	Eruptions of water or falling into water.	Haulage.	Miscellaneous below ground.	Surfaces.	Total deaths.	Below ground.	Above ground.	Below and above ground.
Coal	117	29	33	27	25	1	1	30	16	13	10	135	2.06	.21	1.39
Manganese . .	6	...	...	4	2	...	...	...	...	1	...	7	.62	...	.50
Limestone . .	1	...	...	1	...	...	...	...	...	...	...	1	.48	...	.36
Salt	1	...	...	...	...	...	...	...	...	...	1	1	...	20.41	1.07
Gold	3	...	7	1	1	...	...	...	...	...	...	9	18.04	...	5.05
Wolfram . . .	6	...	...	4	...	...	1	...	...	...	1	6	3.40	.94	2.37
Copper	1	...	...	...	1	...	...	...	...	...	...	1	2.45	...	.82
Clay	1	...	1	...	...	...	...	...	...	...	...	1	4.33	...	3.03
Total 1913 . .	136	29	41	37	29	1	2	30	16	14	12	211	1.71	.19	1.16
Total preceding year.	133	1	35	44	24	5	8	23	16	7	22	185	1.57	.36	1.12
Difference . . .	+3	+28	+6	-7	5	-4	-6	+7	...	+7	-10	+26	+14	-17	+04

APPENDIX III.

PROSECUTIONS UNDER THE MINES ACT.

Statement of prosecutions instituted under the Indian Mines Act, 1901,
during the year 1913.

PROVINCE.	District.	Number of prosecutions.	Number of persons prosecuted.	Number convicted.	Numbers of rules and sections of the Act contravened.	REMARKS.
Bengal	Burdwan	1	4	4	Section 20, Rules 2(a), 2(b), and 19 of Notification No. 864-68-20, dated 10th March 1904.	
	Do.	1	1	1	Ditto.	Withdrawn.
	Do.	1	1	...	Section 20, Rules 12 and 19 of Notification No. 864-68-20, dated 10th March 1904, and Rule 2 of Notification No. 11793-103, dated 30th December 1908.	
	Do.	1	1	1	Section 20, Rules 5, 6 and 7 of Notification No. 11793-103, dated 30th December 1908.	
Bihar and Orissa	Do.	1	1	1	Ditto.	
	Manbhum	1	2	1	Ditto.	
	Do.	1	3	3	Section 20, Rule 1 of Notification No. 11793-103, dated 30th December 1908.	
Bengal	Burdwan	1	1	1	Section 20, Rule 1 of Notification No. 11793-103, dated 30th December 1908.	
Bihar and Orissa	Manbhum	1	1	...	Section 20, Rule 24, of Notification No. 864-68-20, dated 10th March 1904.	Withdrawn.
	Do.	1	1	1	Ditto.	
	Jabalpur	1	1	...	Section 20, Rule 3 of Notification No. 6436-152, dated 2nd September 1911.	Withdrawn.
Central Provinces	Do.	1	1	1	Section 20, Rule 1 of Notification No. 6436-152, dated 2nd September 1911.	
Bengal	Burdwan	1	1	1	Section 20, Rules 2(b), 2(e), and 19 of Notification No. 864-68-20, dated 10th March 1904.	
Bihar and Orissa	Hazaribagh	1	1	1	Section 20, Rule 1 of Notification No. 11793-103, dated 30th December 1908.	
	Do.	1	1	...	Section 20, Rule 1 of Notification No. 11793-103, dated 30th December 1908.	Acquitted.
	Manbhum	1	1	1	Section 20, Rule 1 of Notification No. 864-68-20, dated 10th March 1904.	
	Hazaribagh	1	1	...	Section 20, Rule 1 of Notification No. 11793-103, dated 30th December 1908.	Acquitted.
	Do.	1	1	...	Ditto	Do.
	Do.	1	1	...	Ditto	Do.
	Do.	1	1	...	Ditto	Do.
	Do.	1	1	...	Ditto	Do.
	Do.	1	1	...	Ditto	Do.

APPENDIX IV.

MISCELLANEOUS.

Statement No. 1.
List of -Inspection Circles.

No. 1 Circle.	No. 2 Circle.	No. 3 Circle.
<p>(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.</p>	<p>(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 district in each direction, and all mines in the districts of Hazaribagh, Gaya, Monghyr, Darjeeling and Ranchi.</p>	<p>(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.</p>
<p>(b) All mines in Assam.</p>	<p>(b) All mines in Baluchistan.</p>	<p>(b) All mines in the Presidency of Bombay.</p>
<p>(c) All mines in Burma.</p>	<p>(c) All mines in the United Provinces.</p>	<p>(c) All mines in the Central Provinces.</p>
	<p>(d) All mines in the Panjab.</p>	<p>(d) All mines in the Presidency of Madras.</p>
	<p>(e) All mines in Ajmer-Merwara.</p>	

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.
Hall, Andrew	168	17th March 1913	4041	10th June 1912.
Phelps, James Ernest	169	Ditto	3682	29th June 1910.
Lancaster, Harold	170	22nd December 1913	3719	14th October 1910.
Cooksey, Wilfred	171	Ditto	3514	4th January 1913.
Barraclough, Francis Alan	172	Ditto	3291	6th January 1909.
Martyn, Joseph King	173	Ditto	4156	28th June 1912.
Howieson, David	174	Ditto	3060	31st December 1907.
Evans, Frederick Whitehead	175	Ditto	3871	3rd July 1911.
Allison, Lancelott	176	Ditto	3259	3rd September 1908.
Hughes, Clifford Edward	177	Ditto	4133	28th June 1912.
Shields, William	178	Ditto	2725	21st December 1905.
Caldwell, John Threlfall	179	Ditto	2481	22nd June 1904.

(b) Certificates of competency.

FIRST CLASS.

NAME.	No. of certificate.	Date of certificate.	REMARKS.
Rayneau, Cyril Alexander	64	17th March 1913.	
Guise, Archibald Henry Charles	65	Ditto.	
Bhattacharji, Guru Dass	66	Ditto.	
Akone, Joseph Pogose	67	Ditto.	
Mokadam, Baliram Pandurang	68	Ditto.	
Kanungoe, Manindra Chandra	69	Ditto.	

SECOND CLASS.

Knyvett, Godfrey Denzil	75	17th March 1913.	
Chatterji, Sudhir Mohan	76	Ditto.	
Bose, Hira Lal	77	Ditto.	
Robertson, Andrew	78	Ditto.	
Laing-Martin, C.E.	79	Ditto.	
Pal-Chowdhury, Khirode Chandra	80	Ditto.	
Bhattacharji, Jnanendra Nath	81	Ditto.	
Hyde, George William	82	Ditto.	
Bapty, Frederic	83	Ditto.	
Banerji, Nidersan	84	Ditto.	
Banerji, Pulin Behari	85	Ditto.	
McGrath, Albert Edward	86	Ditto.	
Pal, Dulal Chand	87	Ditto.	
Sarkar, Manindra Nath	88	Ditto.	
Booth, Arthur Emery	89	Ditto.	

(c) Certificate of service.

FIRST CLASS.

Ghosh, Protap Chandra	136	4th February 1913.	
---------------------------------	-----	--------------------	--

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.
Harvard University, Cambridge, Massachusetts, in respect of its Diploma in Mining Engineering.	22nd February 1913.

APPENDIX IV—contd.

MISCELLANEOUS.

Statement No. 4.

SIBPUR COLLEGE.

Apprentice Department.

THE MINING CLASSES.

CIRCULAR.

General explanation.—The Mining Classes are designed to afford theoretical training in the principles of mining generally, to prepare students for positions of responsibility in coal or metal mines, and, in the case of students attending for instruction in coal mining, to qualify them to appear for the examinations of mine managers, as required by the Indian Mines Act, VIII of 1901.

Students obtaining the College "*Diploma in the Principles of Mining*" may be granted a reduction of two years in the qualifying period of practical work upon a coal mine required of candidates for a Colliery Manager's certificate.

The course for *regular mining students* will extend over four years. During the first two years students follow the general course that prepares them for the Sub-Overseer Examination of the Joint Technical Examination Board. The specialised instruction in mining is given in the third and fourth years of the college course and the diploma examination takes place at the end of the fourth year.

During each year of the mining course students are required to attend the college camp of practical mining and surveying, which is held in the coal fields.

Special students.—Persons resident in Bengal, who have been employed upon mines, will be admitted as special students to two years' mining course 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.

Age.—Regular students must be under 18 on the 1st of January of the year of admission if admitted to the first-year class, and under 21 if admitted to the third-year class. There is no limit of age for special students.

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

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.—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.

The session begins each year on, or about, the first Monday in April. The college closes for the long vacation about the second week of August and re-opens on the first Monday in November.

The following are the college fees which must be paid on the 15th of the month for which they are due:—

<i>Initial.</i>		Rs.
Mess entrance fee	. . . . .	2
Athletic club entrance fee	: : : : :	1
Caution money deposit	. . . . .	5
} Non-returnable.		
} Which, if applied for within three years of leaving college, will be returned after deducting any dues outstanding.		
<i>Monthly.</i>		Rs.
Tuition	. . . . .	3 (Due for 12 months).
Electric light	: : : : :	1 (" " 10 ")
Athletic club	. . . . .	1 (Due in March, June and November).

APPENDIX IV—*contd.*

MISCELLANEOUS.

Statement No. 4—*contd.*

Boarding—		
Hindus	10	} During term of 9½ months.
European	25	
Hindus	1	} During vacation of 2½ months.
Europeans	2	

The Syllabus of Instruction of the Mining Class is published in the College Calendar, price twelve annas.

B. HEATON,

Principal, Civil Engineering College.

June 1913.

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.

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.

APPENDIX IV—contd.

MISCELLANEOUS.

Statement No. 5.

MINING INSTRUCTION IN BENGAL AND BIHAR AND ORISSA.

[The Mining Educational Advisory Board desire that Colliery Managers will kindly publish this information in their collieries. An appeal is also made to them to support the lectures by seeing that members of their colliery staff who are suitable take advantage of the lectures and attend them regularly.]

RANIGANJ AND JHARIA COAL-FIELDS.

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

<i>Place and time.</i>	<i>Lecturer.</i>
(1) Lecture-room near Sijua Station, on Tuesdays, at 6-30 P.M.	Mr. B. Starks Field.
(2) Lecture-room near the Jharia Club, on Mondays, at 5-30 P.M.	„ L. A. Jacobs, B.Sc. (Dun.), M.I.M.E.
(3) Lecture-room at Messrs. Apcar and Company's Charanpur Colliery, on Fridays, at 5-30 P.M.	„ H. C. Read, B.Sc. (Birm.).
(4) Lecture-room near Dishargarh Club, Wednesdays, at 5-30 P.M.	„ C. E. Ashcroft, F.G.S.
(5) Railway Institute, Raniganj, on Saturdays, at 4-30 P.M.	„ H. C. Read, B.Sc. (Birm.).

The course of instruction, consisting of not less than 25 lectures, will commence the last week in October and end in the following May. An examination will be held on 1st Monday in June 1914, and candidates who pass the examination will receive a certificate recording their success. No candidate will, however, be permitted to sit for the examination unless he has attended 50 per cent. of the lectures and received 40 per cent. of the marks allotted for home work.

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

The following Sub-Committees have been appointed for each centre:—

RANIGANJ DISTRICT.		
<i>Dishargarh Centre.</i>	<i>Charanpur Centre.</i>	<i>Raniganj Centre.</i>
Mr. G. C. Leach, <i>Chairman.</i>	Mr. C. J. E. David, <i>Chairman.</i>	Mr. C. J. E. David, <i>Chairman.</i>
„ Glen George.	„ T. Sanson.	„ P. S. Keelan.
„ J. Mackintosh.	„ R. Mitchell.	„ A. G. Bennertz.
„ Geo. Miller.	„ E. M. Patterson.	„ W. J. Rees.
„ F. Owen.	„ A. Russell.	Babu Promotho Nath Hazra.
Babu M. N. Ray (Begunia).	Babu Atul Sasi Mitra.	„ Bejoy Krishna Banerji.
„ H. P. Mukherji (Chota Dhemu).	The Local Lecturer, <i>Secretary.</i>	
„ D. C. Tarafdar.		
The Local Lecturer, <i>Secretary.</i>		
JHARIA DISTRICT.		
<i>Jharia Centre.</i>		<i>Sijua Centre.</i>
The Chief Inspector of Mines, <i>Chairman.</i>		Mr. R. B. Simpson, <i>Chairman.</i>
Mr. T. Adamson.		„ A. Agabeg.
„ R. G. M. Bathgate.		„ E. S. Bennertz.
„ R. J. Browne.		„ J. S. Kean.
„ A. S. Thomson.		Babu Moti Lal Raha.
Babu Bhupati Mukherji.		„ Surendra Nath Sarkar.
„ Sita Nath Dutta.		The Local Lecturer, <i>Secretary.</i>
The Local Lecturer, <i>Secretary.</i>		

APPENDIX IV—*contd.*

MISCELLANEOUS.

Statement No. 5—*contd.*

JHARIA DISTRICT.

A proposal to open a centre at Mugma is under consideration.

Particulars of the Sibpur College Mining classes 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, and the time spent may reduce by two years the time required for the Mine Manager's certificate.

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.

1. *Geology*.—General structure of the crust of the earth ; descriptions of fault, dykes, 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, wash-outs, 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 cross-cut.
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 ; pitbanking 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 safety lamps, Sir Humphrey Davy's experiment ; the Davy lamp, the Clauny and Thomas and Williams lamps, the Marsaut and Mueseler lamps ; fire-damp detectors.

SECOND-YEAR COURSE.

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 of boilers. Heap steads ; 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.

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

W. H. EVERETT,

(*Offg. Supdt. of Industries, etc.*),

Secretary to the Mining Educational Advisory Board,

Writers' Buildings, Calcutta.

Statement No. 6.

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

Statement No. 7.

NOTIFICATION.

No. 4100.—The 19th August 1913.—In exercise of the powers conferred by Section 11 of the Bengal Mining Settlements Act, 1912 (Bengal Act II of 1912), the Governor in Council is pleased to make the following rules for carrying out the purposes and objects of that Act in respect of all mining settlements and certain groups or classes of mining settlements in the Presidency of Fort William in Bengal.

R U L E S .

PART I.

RULES FOR THE NOMINATION BY OWNERS OF MINES OR THEIR REPRESENTATIVES OF PERSONS TO BE APPOINTED TO A MINES BOARD OF HEALTH UNDER SECTION 3 (2) OF BENGAL ACT II OF 1912.

Definition.

1. In these rules—

- (a) the expression "Magistrate" means the Magistrate of the district and includes a Deputy Commissioner of a district ;
- (b) the expression "the Act" means the Bengal Mining Settlements Act, 1912 ;
- (c) the expression "Board" means the "Mines Board of Health."

2. (1) A register shall be maintained by the Magistrate in which shall be shown for the area for which the Board is to be appointed the name, place of residence, and number of votes to which he is entitled of the owner of every mine or of the representative of every such owner who is entitled to nominate persons to be appointed to the Board.

(2) If a person is the owner of more than one mine all such mines shall be grouped together in one entry, and if a colliery or mine is owned by more than one person the name of one owner or representative only shall be entered.

3. (1) Any mine-owner or his representative may, on or before a date to be fixed by the Magistrate, apply to have his name registered. Such application, which may be made by post, shall contain full particulars of the collieries or mines of which the applicant is owner or representative.

(2) The Magistrate shall on receipt of such application register the name of the applicant:

Provided that, for reasons to be recorded in writing, he may refuse to register the name of any such applicant.

4. The Magistrate may of his own motion register or remove from the register (for reasons to be recorded in writing) the name of any mine owner or his representative:

Provided that such name shall not be removed until the expiry of fifteen days from the service of a notice on the person whose name the Magistrate proposes to remove from the register.

Mutation of names.

5. Mutation of names shall be effected by the Magistrate either on application or of his own motion.

Provided that the reasons for refusing an application shall be recorded in writing.

6. In the case of an order passed by the Magistrate rejecting an application to be registered, removing the name of a person already on the register or rejecting an application for mutation of names, an appeal shall lie to the Commissioner of the Division if filed within 30 days from the date of the order. The decision of the Commissioner shall be final.

Classification of voters.

7. (1) Persons whose names have been entered in the register shall be classified as follows:—

Class A.—Owners of mines with an average output, for each of the preceding three years, of 400,000 tons or more, or representatives of such owners.

Class B.—Owners of mines with an average output, for each of the preceding three years, of 350,000 tons or more, or representatives of such owners.

Class C.—Owners of mines with an average output, for each of the preceding three years, of 300,000 tons or more, or representatives of such owners.

Class D.—Owners of mines with an average output, for each of the preceding three years, of 250,000 tons or more, or representatives of such owners.

Class E.—Owners of mines with an average output, for each of the preceding three years, of 150,000 tons or more, or representatives of such owners.

Class F.—Owners of mines with an average output, for each of the preceding three years, of 100,000 tons or more, or representatives of such owners.

Class G.—Owners of mines with an average output, for each of the preceding three years, of 50,000 tons or more, or representatives of such owners.

Class H.—Owners of mines with an average output, for each of the preceding three years, of 25,000 tons or more, or representatives of such owners.

Class I.—Owners of mines with an average output, for each of the preceding three years, of 5,000 tons or more, or representatives of such owners.

Class J.—Owners of mines with an average output, for each of the preceding three years, of less than 5,000 tons, or representatives of such owners.

(2) The classification shall be determined by the Chief Inspector of Mines.

(3) Persons in Class A shall be entitled to sixteen votes, in Class B to fourteen votes, in Class C to twelve votes, in Class D to ten votes, in Class E to seven votes, in Class F to five votes, in Class G to four votes, in Class H to three votes, in Class I to two votes, and in Class J to one vote.

8. (1) When it becomes necessary that the Local Government should appoint one or more persons under section 3 (2) of the Act, the Magistrate shall fix a date on which the election shall be held and shall require each person entered in the register to forward to him on or before the date so fixed the names of the persons whom he desires to nominate for appointment.

(2) Such requisition, which shall ordinarily be forwarded by registered letter, shall contain the following particulars :—

- (a) The number of persons to be appointed by the Local Government.
- (b) The number of votes to which the voter is entitled.
- (c) The hour and date on which votes will be counted.

9. (1) On the date fixed the Magistrate shall count the votes received and shall forward to the Local Government through the Commissioner of the Division the names of the persons who have received the largest number of votes.

(2) In the event of an equality of votes the Magistrate shall decide by lot which persons shall be recommended for appointment.

PART II.

RULES FOR THE NOMINATION BY PERSONS WHO RECEIVE ROYALTIES, RENTS OR FINES FROM MINES OF PERSONS TO BE APPOINTED TO A MINES BOARD OF HEALTH UNDER SECTION 3 (3) OF BENGAL ACT II OF 1912.

10. (1) A register shall be maintained by the Magistrate of the district in which shall be shown for the area for which the Board is to be appointed, the name, place of residence and number of votes to which he is entitled of each person who receives royalties, rents or fines from mines.

(2) If such royalties, rents or fines be received by a number of sharers, the name of one only of such sharers shall be entered in the register.

11. (1) Any person who receives royalties, rents or fines may, on or before a date to be fixed by the Magistrate, apply to have his name registered. Such application, which may be made by post, shall contain full particulars of the mines in respect of which royalties, rents or fines are received, the amounts so received and the amount paid as road cess.

(2) The Magistrate shall, on receipt of such application, register the name of the applicant :

Provided that for reasons to be recorded in writing he may refuse to register the name of any such applicant.

12. The Magistrate may of his own motion register or, for reasons to be recorded in writing, remove from the register the name of any person who receives royalties, rents or fines from mines :

Provided that in the latter case previous notice shall be given to the person whose name the Magistrate proposes to remove.

Mutation of names.

13. Mutation of names shall be effected by the Magistrate on application or of his own motion :

Provided that the reasons for refusing an application shall be recorded in writing.

14. (1) In the case of an order passed by the Magistrate rejecting an application to be registered, removing the name of a person already on the register or rejecting an application for mutation of names, an appeal shall lie to the Commissioner of the Division, if filed within 30 days from the date of the order.

(2) The decision of the Commissioner shall be final. —

Classification of voters.

15. (1) Persons whose names have been entered in the register shall be classified as follows :—

Class A.—Persons who have during the preceding year paid Rs. 100 or less as road cess.

Class B.—Persons who have during the preceding year paid more than Rs. 100 but not more than Rs. 500 as road cess.

Class C.—Persons who have during the preceding year paid more than Rs. 500 but not more than Rs. 1,000 as road cess.

Class D.—Persons who have during the preceding year paid more than Rs. 1,000 but not more than Rs. 2,500 as road cess.

Class E.—Persons who have during the preceding year paid more than Rs. 2,500 but not more than Rs. 10,000 as road cess.

Class F.—Persons who have during the preceding year paid more than Rs. 10,000 as road cess.

(2) Persons in Class A shall be entitled to one vote, in Class B to two votes, in Class C to four votes, in Class D to eight votes, in Class E to ten votes, and in Class F to sixteen votes.

(3) The classification shall be determined by the Magistrate of the district.

16. When it becomes necessary that the Local Government should make an appointment under section 3 (3) of the Act the Magistrate shall hold an election in the manner prescribed in Rules 8 and 9 in Part I of these Rules.

Election.

PART III.

RULES REGARDING THE TENURE OF OFFICE OF MEMBERS OF A MINES BOARD OF HEALTH.

17. (1) Every member of the Board shall vacate his office at the end of three years from the date of the order of the Local Government appointing the Board. The term of three years mentioned in this rule shall be held to include any period which may elapse between the expiration of the said three years and the first meeting of the newly appointed Board at which a quorum shall be present.

Term of office.

18. If any member of the Board who has been appointed under section 3 (2) or section 3 (3) of the Act shall be unable to complete his full term of office, the Magistrate shall, for the purpose of filling the vacancy, hold an election in the manner described in Rules 8 and 9 in Part I of these rules.

Filling of vacancies.

19. The Commissioner of the Division may remove any member of the Board if he absents himself from eight consecutive meetings of the Board without the permission of such Board.

Removal of members on account of absence.

PART IV.

RULES REGULATING THE PROCEDURE OF A MINES BOARD OF HEALTH AND THE POWERS AND FUNCTIONS OF THE CHAIRMAN.

20. (1) Ordinarily a meeting of the Board shall be held once a month on a date to be fixed by the Chairman, but as many meetings may be held, and at such times as the Chairman may direct.

Date of meeting and notice.

(2) At least one week's notice of all meetings shall be given to each Member.

Vice-Chairman.

21. (1) At the first meeting held after the appointment of the Board the members shall elect one of their number to be Vice-Chairman.

(2) The Chairman, or in his absence the Vice-Chairman, shall preside at every meeting and in the absence of both the Chairman and Vice-Chairman the members present shall choose one of their number to preside.

Chairman.

Quorum.

22. (1) The quorum necessary for the transaction of business shall be three.

(2) If at any meeting a quorum is not present, the member who presides shall adjourn the meeting until such other day as he thinks fit. At such adjourned meeting any number of members present will form a quorum.

Voting by proxy prohibited.

23. (1) Voting by proxy shall not be permitted.

(2) In the event of an equality of votes on any question brought before the Board, the presiding officer shall have a second or casting vote.

Casting vote.

PART V.

RULES FOR THE REGULATION OF EXPENDITURE TO BE INCURRED BY A MINES BOARD OF HEALTH AND FOR THE CALCULATION AND RECOVERY OF SUMS DUE TO IT.

24. (1) The Board shall prepare, not later than the 1st day of January in each year, an estimate of receipts and expenditure (other than expenditure incurred under sections 7 and 8 of the Act) for the ensuing financial year.

Preparation of estimate.

(2) Such estimate shall be accompanied by a statement showing the total amounts to be recovered from (a) owners of mines, and (b) receivers of royalties, rents and fines, and showing also in each case the rate of assessment which it is proposed to impose under section 10 (3) of the Act.

25. Such estimate and statement shall be open to the inspection of the public at the Inspection, consideration and submission of office of the Board for a period of not less than estimate. fourteen days and on the expiry of that period the Board shall, after considering the objections, if any, which have been received, and after amending, if necessary, the estimate, forward it with full explanatory notes to the Commissioner of the Division for approval.

26. The Commissioner may either sanction the estimate as it stands or approve of it after Sanction or return of estimate by Commissioner. making such alterations therein as he may think necessary, or may return it to the Board for such modifications as he may think necessary, and when such modification has been made, the estimate shall be resubmitted for the approval of the Commissioner.

27. When a Board is first appointed, an estimate of receipts and expenditure for the remaining portion of the financial year shall be prepared and published in the manner prescribed in rules 24 and 25 and be submitted to the Commissioner for approval.

28. If during the course of the year it is necessary to revise the estimate, a revised estimate shall be prepared and published in the manner described in rules 24 and 25 and shall be submitted to the Commissioner for approval.

29. The Board shall submit annually to the Commissioner, not later than the 15th of May, a report of the working of the Board during the previous year, accompanied by statements showing the actual receipts and expenditure as well as statements showing in detail—

- (a) the expenditure incurred under sections 7 and 8 of the Act,
- (b) the amounts recovered under section 10 (2) of the Act, and
- (c) the payments made to holders of land under section 10 (5) of the Act.

30. The account and audit rules prescribed under the Bengal Local Self-Government Act of 1885 for District Boards shall, so far as possible, be observed by the Board.

Account and Audit Rules.

PART VI.

RULES PRESCRIBING THE DUTIES OF OWNERS, AGENTS AND MANAGERS OF MINES IN RESPECT OF MINING SETTLEMENTS AND OF ALL PERSONS ACTING UNDER THEM.

31. Every mine owner and every employé of a mine owner shall be bound, when called upon, to render all reasonable assistance to officers of the Board in carrying out their duties.

32. Every mine owner and manager shall be bound to supply to the Board such periodical returns of births and deaths as they may be called upon to furnish.

33. Every mine owner and manager shall be bound to furnish to the Chief Sanitary Officer of the Board immediate information regarding the occurrence of any case or suspected case of cholera, plague or small-pox.

34. Every mine owner and manager shall be bound to supply to the Board such periodical returns of output as they may be called upon to furnish, and the Board may, for the purpose of verifying such returns, inspect or call for the production of any registers or books.

PART VII.

RULES FOR SANITATION AND CONSERVANCY IN MINING SETTLEMENTS FOR THE TAKING OF MEASURES TO PREVENT THE OUTBREAK OR SPREAD OF EPIDEMIC DISEASE AND TO REGULATE THE DUTIES AND POWERS OF SANITARY OFFICERS.

35. The Board may establish and maintain burning ghats and burial-grounds and may, by general order, direct that in the whole or any specified part of the Mining Settlement, corpses shall not be burnt or buried at places other than those provided for the purpose.

36. (1) The Board may issue a written order on any mine owner, manager, or landholder directing him to close or empty within a time to be stated in the order, and for such time as may be specified therein, any well, tank or other source of water-supply situate within or partly within his property which, in the opinion of the Chief Sanitary Officer is contaminated, and, in the event of the work not being carried out within the time stated in the order or to the satisfaction of the Chief Sanitary Officer, the Board may itself carry out the work.

(2) The powers granted by this rule may be delegated by the Board to its Chief Sanitary Officer.

Delegation of powers to Chief Sanitary Officer to seize bad food and dispose of corpses.

37. The Board may delegate to its Chief Sanitary Officer power—

- (a) to seize and destroy any articles of food or drink which in his opinion are unfit for consumption ;

(b) to seize and dispose of the corpse of any person who he has reason to believe has died of any epidemic disease.

38. (1) The Board may issue a written order on any mine owner, manager or landholder directing him to carry out, within a time to be stated in the order, such measures for the disinfection or evacuation of dwelling-houses, or for the destruction of infected bedding or clothing as the Chief Sanitary Officer may consider necessary, and in the event of such measures not being carried out within the time stated in the order, or to the satisfaction of the Chief Sanitary Officer, may authorize the Chief Sanitary Officer to carry out the work.

Disinfection and evacuation of houses.

(2) The power granted by this rule may be delegated by the Board to its Chief Sanitary Officer.

Power of Board during epidemic to close shops or market.

39. (1) The Board may, during the prevalence of an epidemic, direct that any market shall remain closed for such time as may appear to be necessary.

(2) The power granted by this rule may be delegated by the Board to its Chief Sanitary Officer.

40. The previous sanction of the Local Government shall be required for the exercise by the Board within any prescribed area within the mining settlement of all or any of the powers and functions specified in rules 41 to 60.

Sanction of Local Government required for exercise of certain powers.

41. (1) The Board may provide establishments, cattle, carts and implements required for the removal of sewage, offensive matter and rubbish and may provide places convenient for the deposit thereof by occupiers of houses.

Removal of sewage and rubbish.

(2) Where such places have been provided, the Board may require the occupiers of houses to deposit the same daily or at stated intervals in such places.

(3) Where such places have not been provided, the Board may require every occupier of any house or land to place rubbish at stated hours on the public road adjacent to his house or land.

Drains, privies and cess-pools.

42. All drains, privies and cess-pools shall be subject to the inspection and control of the Board.

43. The Board, or any officer authorized by it in that behalf, may inspect all privies, drains and cess-pools at any time between sunrise and sunset, after two hours' notice in writing to the occupier of any premises in which such privies, drains or cess-pools are situated, and may, if necessary, cause the ground to be opened wherever the Board, or the officer authorized by it, may think fit for the purpose of preventing or removing any nuisance arising from such privies, drains or cess-pools.

Inspection of drains, privies and cess-pools.

44. Whenever the Board is satisfied that the existence of such privy, drain or cess-pool is attended with risk of disease to the inhabitants of the neighbourhood, it may direct the use of such disinfectants or deodorants as it shall specify, in such privy, drain or cess-pool, in such quantities or for such time as it shall think fit.

Disinfection of privies, drains and cess-pools.

Common privies and urinals.

45. The Board may provide and maintain common privies or urinals.

46. Whenever any land, being private property or within any private enclosure, appears to the Board by reason of thick or noxious vegetation or jungle, or inequalities of surface, to be likely to impede sufficient ventilation or to be otherwise injurious to health, or by want of drainage to be in a state injurious to health, or offensive to the neighbourhood, the Board may require the owners or occupiers, or the owners and occupiers of such land, within fifteen days, to clear and remove such vegetation or level such surface or drain such land :

Clearance and drainage of waste land.

Provided that if, for the purpose of effecting any drainage under this rule, it shall be necessary to acquire any land not being the property of the person who is required to drain his land, or to pay compensation to any other person, the Board shall provide such land and pay such compensation.

47. All existing public sewers, drains and other conservancy works shall be under the direction and control of the Board, who may construct such further works of that nature as they may consider necessary.

Control of public sewers and drains.

48. The Board may, by order published at such places as it may think fit, set apart any well, tank, part of a river, stream or channel, not being private property, for the supply of water for drinking and for culinary purposes and may prohibit therein all bathing, washing of clothes or animals or other acts calculated to pollute the water; and may similarly set apart any well,

Provision of water.

tank, part of a river, stream or channel for the purpose of bathing, or for the purpose of washing animals or clothes or for any other purpose connected with the health, cleanliness or comfort of the inhabitants of the mining settlement.

49. The Board may, by an order published at such places as it may think fit, prohibit
 Prohibition of pollution of public water-supply. in the private portion of any stream or channel used as a part of the public water-supply, bathing, washing of clothes or animals or any other act likely to pollute the water in the public portion of such stream or channel.

50. If the Chief Sanitary Officer of the Board certifies that the water in any well, tank or other place is likely, if used for drinking, to engender or cause the spread of any dangerous disease, the Board may prohibit the removal or use of such water for drinking during a period to be specified in the notice.
 Prohibition of use of polluted water.

51. The Board may require the owner or occupier of any land within eight days, or such longer period as the Board may fix, either to re-excavate or fill up with suitable material, at his option, or to cleanse any well, watercourse, private tank or pool therein, and to drain off and remove any waste or stagnant water which may appear to be injurious to health or offensive to the neighbourhood :
 Power to order improvement of water-supply.

Provided that if, for the purpose of effecting any drainage under this section, it shall be necessary to acquire any land not being the property of the person who is required to drain his land or to pay compensation to any other person, the Board shall provide such land and pay such compensation.

52. The Board may require the owners or occupiers, or the owners and occupiers of any land, within fifteen days to repair and make efficient any drain, privy or cess-pool, or to remove any privy or close any cess-pool which is situated on such land:
 Power to order repair of drain, privy or cess-pool.

53. If any person, without the written consent of the Board first obtained, makes or causes to be made, or alters or causes to be altered, any drain leading into any of the sewers or drains vested in the Board, the Board may cause such branch drain to be demolished, altered, re-made, or otherwise dealt with as they shall think fit.
 Unauthorised alteration of drain.

54. If any land, being within one hundred feet of a sewer, drain or other outlet into which such land may, in the opinion of the Board, be drained, is not drained to the satisfaction of the Board, the Board may require the owner, within one month, to drain the said land into such sewer, drain or outlet.
 Power to direct drainage into sewer or drains.

55. (1) No person shall, without the written permission of the Board, construct or keep any latrine, urinal, cess-pool, house-drain, or other receptacle, for sewage or other offensive matter, within one hundred feet of any public tank or watercourse or a tank or watercourse which the inhabitants of any locality use.
 Prohibition against latrines, urinals in proximity to tanks or watercourses.

(2) The Board may require any owner and occupier upon whose land any latrine, urinal, cess-pool, house-drain or other receptacle so situated exists, or may hereafter be constructed, to remove the same within eight days.

56. No person shall, without the written permission of the Board, construct a privy with a door or trap-door opening on to any road or drain. The Board may require any owner or occupier upon whose land any such privy exists to remove the same within eight days.
 Removal of privies with doors opening on road.

57. (1) The Board may, by a general order, prohibit the making of excavations for the purpose of taking earth or stone therefrom, or for the purpose of storing rubbish or offensive matter therein, and the digging of cess-pools, tanks or undrained excavations without special permission previously obtained from them.
 Power to prohibit excavations.

(2) If any such excavation, cess-pool or tank is made after the issue and publication of such order, without such special permission, the Board may require the owners and occupiers of the land on which such excavation, cess-pool or tank is made, within two weeks, to fill up such excavation.

58. Whenever the Board is satisfied, from inspection, or by report of competent persons that any existing block of huts within the mining settlement is, by reason of the manner in which the huts are constructed or crowded together, or of the want of drainage and the impracticability of scavenging, attended with risk of disease to the inhabitants of the neighbourhood, they may cause the locality to be inspected by two Medical Officers, who shall make a report in writing on the sanitary condition of the said block of huts; and shall specify, if necessary, in the said report, the huts which should be removed, the roads, drains, and sewers which should be constructed and the low lands which should be filled up, with a view to the removal of the said risk of disease.
 Enquiry as to insanitary blocks of huts, and report.

59. On receipt of the said report, the Board may require the owners or occupiers of the huts, or at the option of the Board, the owner of the land on which such huts are built, to carry out and execute, within a reasonable time, to be fixed by the Board for such purpose, all or any of the works specified in the aforesaid report or any portion thereof respectively, and if such owner, owners or occupiers shall fail to comply with such requisition, the Board itself may execute all or any of such works.

60. Every owner, or occupier, or farmer, of any place for the sale of meat, poultry, fish or vegetables, or of any slaughter-house, within the limits of the mining settlement shall cause such drains to be made therein as shall be considered sufficient by the Board and (if required so to do by the Board) shall cause all the floors and drains to be paved with stone or burnt brick, and shall also cause a supply of water to be provided, sufficient for keeping such place or slaughter-house in a clean and wholesome state.

H. F. SAMMAN,
Offg. Secy. to the Govt. of Bengal.