

Colonial Secretary were also fruitless.⁹⁴ The Colonial Office supported Milner and his officials: it agreed that there was "no truth in the complaints" of the Transvaal Miners' Association. Both Milner and the Colonial Secretary dismissed the view of organised labour that the miner was placed "in the unhappy position of either disobeying his employer or otherwise violating the regulations": the miner's refusal to comply with management's directives led to his summary dismissal.⁹⁵ In 1905, when convicting fifteen miners for breaking the Sunday Act, the Resident Magistrate of Johannesburg confirmed the contention of the miners' union. In passing judgement he stated:

Under the existing law the miners suffer a hardship, inasmuch as if they did not work they would be discharged, and if they did work they were prosecuted.⁹⁶

Because of their prior experience as senior employees in the mining houses, the personnel of the Department of Mines were biased in favour of and actively supported the industry's need to reduce working costs. This priority influenced their dealings with miners. During Crown Colony rule of the Transvaal, officials of the Mines Department generally viewed the needs of miners as being subordinate to the profit margins of the industry. In complying with many wishes of the Association of Mine Managers, mine inspectors often "liberally construed" the regulations to meet the "present circumstances".⁹⁷

This attitude was particularly evident in the conclusions reached by the commission which investigated the question of mining by single outlet. The commission, which included two mine inspectors, agreed to allow the Cinderella Deep, in contravention of the mining regulations, to continue producing temporarily with only one shaft. The rationale of the commissioners was that "the absolute prohibition of stoping might mean ruin to a mining company and a serious blow to the industry".⁹⁸ In drawing this conclusion the commissioners were influenced both by the representations of the Chamber of Mines and by the Government Mining Engineer, Weldon, "acting as an independent witness".⁹⁹

The "present circumstances" also influenced the views of most of the Rand's residents towards the industry. They were well aware that the welfare of the community and of each of its individual members hinged on the prosperity of the gold mining industry. Many residents also believed, as did Thomas Leggett, the American consulting engineer for the S. Neumann group, that the material progress of the industry in 1902 was vital to the "whole of South Africa".¹⁰⁰ In 1905 William Cullen, in his presidential address to the Chemical, Metallurgical and Mining Society of South Africa, summed up the prevailing mood:

I say directly advisedly, but indirectly everyone of us is dependent on that great industry; I go further, and maintain that not only we, as Transvaalers, but the whole of South Africa, including even the Portuguese province is in precisely the same

position.¹⁰¹

This view did not merely reflect the "ideology of mining capital" as Belinda Bozzoli suggests;¹⁰² it was a material circumstance. Milner tried to balance the demands of rural development with those of the mines.¹⁰³ Nevertheless, the gold mining industry was the predominant economic force in the Transvaal. Even after Union, during the period 1911 to 1912, the contribution of gold mining to the national income of South Africa was 19,6 per cent as compared to the combined contribution of farming and fishing, which was 16,1 per cent.¹⁰⁴

Medical doctors, too, were conscious that the advancement of the industry both directly and indirectly affected their livelihoods. After the British conquest of the Transvaal many doctors from the United Kingdom emigrated to the Witwatersrand, where they joined their colleagues, who had reopened their pre-war practices.¹⁰⁵ Also, a number of doctors who had served as medical officers during the war, particularly in the detention camps, decided to remain in the Transvaal.¹⁰⁶ But most of those who had hoped "to make thousands a year" were "sadly disappointed". Within a short time the profession on the Witwatersrand was "overstocked": there were too many doctors for the demand.¹⁰⁷ As a result, doctors on the Rand were obliged to depend "either largely or entirely, on appointments, either Government or mine".¹⁰⁸ The few doctors who obtained government billets, including district surgeoncies, did

"well",¹⁰⁹ But most doctors relied on part-time appointments on the mines - until 1914 only a handful of mines employed doctors on a full-time basis.¹¹⁰

Some mine doctors attended to both Africans and whites on the mine,¹¹¹ while others had racially distinct part-time practices. On mines where two doctors practised, the white mineworkers belonging to the mine benefit society chose their own doctor, while the mine manager appointed, as "an unavoidable evil", the black mineworkers' doctor.¹¹² All the part-time mine doctors were unsalaried professionals who worked for "so much per head";¹¹³ and all depended on the "patronage" of the mine managers.¹¹⁴

As a professional group, doctors in South Africa generally had a relatively low economic and social standing: they often bitterly complained about their relatively inferior status.¹¹⁵ But doctors on the Witwatersrand, where wealth and status tended to coincide, perceived their standing to be lower than that of their professional counterparts elsewhere in the country.¹¹⁶ The reliance of Rand doctors on mine appointments further diminished their independence and prestige: "the mine doctor was "very much at the mercy of the Manager".¹¹⁷ Doctors were responsible to the mine managers and not to the mining house directors.¹¹⁸ In 1906, for instance, the Association of Mine Managers refused the Transvaal Medical Society's request for an increase in the rate "per head" paid to mine doctors. In terminating

negotiations the mine managers asserted arrogantly that "they could easily get rid of their doctors if necessary and find plenty of doctors to replace them".¹¹⁹

By holding positions as health officers on the mines, doctors were in a conflictual situation. Management expected doctors to forgo their impartiality in favour of their loyalty to the industry. In private correspondence Sansom acknowledged that the public regarded doctors, who were employed in jobs directly associated with the industry, to be "not unbiassed".¹²⁰ J. S. Marwick's indictment of mine doctors, particularly those who cared for Africans, was much harsher than that of Sansom. In a confidential letter to John X. Merriman, Marwick, an independent labour recruiter, provided the glaring example of the "anomalous" position of Alfred Edward Miller: the district surgeon for Boksburg, Miller, was simultaneously chief medical officer for the East Rand Proprietary Mines, where he attended to 24 000 African mineworkers.¹²¹ Marwick further alleged that Miller was partial to the Rand Mutual Assurance Company, the insurance company, which the Chamber had founded and financed after it had agreed in 1905 to pay compensation to Africans involved in mine accidents.¹²² According to Marwick, in his state capacity Miller often rejected Africans' claims for accident compensation or adjusted their financial appeals in favour of the insurance company.¹²³

Doctors often compromised medical standards to accommodate the needs and costs of the industry in order to safeguard their jobs.¹²⁴ They accepted positions in which management put no restriction on their case loads.¹²⁵ On most mines doctors were responsible for the health care of a minimum of 2 000 black mineworkers.¹²⁶ Undoubtedly the medical care of Africans on the mines was worse than that of whites. Even so, because of their terms of employment, mine doctors, in general, provided medical services of a poor quality to both white and African mineworkers.¹²⁷ In 1910 an inspector of mines, who understood the insecurity of mine medical officers, perceptively explained their predicament to one of his colleagues:

Mine doctors will rather accept existing conditions than jeopardize their positions by suggesting drastic and expensive improvements. I have had complaints from mine doctors as to these conditions [the housing accommodation on the mines and the treatment extended to the miners in cases of sickness or disease], but such complaints have always been accompanied by the request that I should not state that the complaint, or the opinion expressed, came from them.¹²⁸

As Jeeves has shown, the propaganda of the mineowners was successful in convincing the public that their welfare was tied not only to the successful performance of the industry as a whole but also to the profitability of the poorest and weakest low-grade producers.¹²⁹ Doctors succumbed to the persuasion, too, as is evident in the way the medical profession handled health issues relating to the mines. Even

doctors who held state appointments and therefore enjoyed an independence from mining house control could not escape the tentacles of the industry: in making decisions on health issues concerning mineworkers, the cost of health services to the industry, and particularly to the poorer mines, influenced the decisions of almost the entire medical profession on the Witwatersrand. This is well illustrated by the compound controversy in 1904.

In terms of the Labour Importation Ordinance of 1904, which permitted the importation of indentured Chinese labourers, the mineowners were obliged to build suitable compounds, which would satisfy state requirements.¹³⁰ Also, the Randlords agreed that the same standards for the Chinese would apply to Africans.¹³¹ George Turner, the Transvaal Medical Officer of Health, stipulated that the compounds provide 300 cubic feet of air space per person. But the Chamber objected on the ground of expense. The difference between 200 and 300 cubic feet air allowance was £5 per person; the poorer mines could afford only 200 cubic feet per person.¹³²

As Turner refused to modify his requirements, which complied with British ventilation standards,¹³³ on the initiative of the Chamber, Sir Arthur Lawley, the Lieutenant Governor of the Transvaal, agreed to defer the matter. He was prepared to wait until the Transvaal Medical Society had presented an independent report to investigate whether 200 cubic feet per

person would satisfy medical standards of health.¹³⁴ Like the mine doctors, whose advice the Chamber had earlier sought,¹³⁵ the report of the sub-committee of the Transvaal Medical Society accepted the Chamber's proposal, provided that additional provisions were made for air circulation: the doctors rejected the British ventilation standards as being inappropriate to conditions on the Witwatersrand.¹³⁶

Turner, however, remained obdurate: he ignored the allegation that "he did not know the conditions as well as those men did".¹³⁷ In a letter to Milner he rejected the "compromise", to which the committee of doctors had agreed. Turner argued that the committee's recommendation of 200 cubic feet of air space per person would cause overcrowding so promoting the spread of tuberculosis. He also warned that the committee's proposal for increased draughts of air would be conducive to "a virulent form of pneumonia".¹³⁸ In 1912 the visiting American consultant, W. C. Gorgas, by presenting similar criticisms of the reduced compound air space, vindicated Turner.¹³⁹

In view of the deadlock, Milner in August 1904 appointed the Coloured Labourers' Compound Commission to decide the issue. Apart from Dr James Moir, the chemist to the Department of Mines, the five-man commission, which included Turner, were doctors. Except for Turner, all the commissioners recommended that the air space per person in the compounds should

be 200 cubic feet.¹⁴⁰ In the view of the Colonial Office, British ventilation "practice", on which Turner based his evidence in his dissenting minority report, "was on his side - very much on his side".¹⁴¹ The Colonial Office was convinced that "the practical difficulties of acting on his [Turner's] view", which the Chamber had stressed in its evidence to the commission,¹⁴² had influenced the majority conclusion:¹⁴³ the commissioners, by acknowledging the "practical difficulties", saved the industry £2 225 000 in compound costs.¹⁴⁴

Like the rest of the Witwatersrand community, doctors were sensitive to the impact on their livelihoods of the economic vagaries of the gold mining industry. In the compound controversy they clearly modified medical standards to accommodate the industry. They took seriously the implied threat of Harold Strange, the President of the Chamber in 1904, who warned:

If the latter [Turner's ventilation standard] were enforced it would greatly affect the prosperity of the country...in fact, it would not be within the power of many of the companies to take advantage of the provisions of the Ordinance [to employ Chinese labourers].¹⁴⁵

Like other "informed opinion in South Africa", Witwatersrand doctors, who held independent state positions, "warmly" supported "all fair and legitimate measures calculated to advance the mining industry".¹⁴⁶ State health officers, including Sansom and Charles Porter, the Johannesburg Medical Officer

of Health, who served on numerous health commissions, in public refrained from making "damaging statements which vitally affect the industry on which the welfare of this country depends".¹⁴⁷ In this respect they conformed to the majority view of members of the mining community: it did not countenance "lightly" critical or "alarming" pronouncements.¹⁴⁸ Neither the Chamber nor most members of the mining community wanted to shake the overseas investors' confidence in the industry. Nor did they want to disturb the consciences of shareholders, not all of whom "were Randlords and plutocrats, but simply middle-class investors".¹⁴⁹ Indeed, the Chamber was so sensitive to any adverse publicity concerning the industry that it set up a Committee of Mining Representation "to deal with criticism of mining policy".¹⁵⁰ The Chamber undoubtedly approved the stance of state-employed doctors, who played an important role in promoting the image of the industry. The approach of the medical profession was subtle. When necessary, doctors advocated health improvements on the mines. But they played down or denied the industry's responsibility for creating the very conditions which required reform.

It was only after Union that the Witwatersrand medical profession was publicly censured. In 1912 Stanley A. M. Pritchard, the Director of the Government Native Labour Bureau, accused the mine medical doctors of being "callously careless of the

welfare of the patients under their charge": their attention to African mineworkers, he told J. W. Sauer, the Minister of Native Affairs, was "shockingly inadequate".¹⁵¹ Dr Alfred John Gregory was even more direct than Pritchard: he "was out for blood".¹⁵²

As we have seen,¹⁵³ in a controversial separate report to the Tuberculosis Commission, which he had chaired, Gregory in 1914 attacked two of his fellow commissioners, George Turner junior, the medical officer of the WNLA, and Charles Porter. Gregory, the retired Cape Medical Officer of Health and significantly, not a Transvaaler,¹⁵⁴ censured Turner and Porter for their uncritical findings regarding the health care of African mineworkers. He alleged that the conclusions of the two doctors were subjective and partial to the gold mining industry: their posts identified them "intimately with the existing system of control".¹⁵⁵

This was not the first time that Porter had been publicly criticised; in 1913, in the Union House of Assembly, H. Mentz, the MP for Zoutspansberg, claimed that Porter could not be objective on the question of mine medical services for Africans, "because it might trench on his own work".¹⁵⁶ As a member of the 1913 Select Committee on Native Affairs, Mentz had been alerted to the deficiency of the medical services that catered for black mineworkers.¹⁵⁷

Pritchard, Gregory and Mentz were appalled by the industry's poor medical health care of African mineworkers. Also, except for a handful of dissidents, the Transvaal medical profession was equally unsolicitous towards white miners.¹⁵⁸ Until 1914 most doctors were uncritical of the mineowners' liability for disease, particularly silicosis, amongst its white workforce.

In May 1901, when the industry started production for the first time since the outbreak of war in October 1899, health problems had not yet surfaced. In the view of Thomas Leggett the "vital question" was "to get this Industry at work at the earliest possible moment".¹⁵⁹ Mine managers agreed. After nearly two years of lost production, they intensified their attempts to "speed up" and to reduce working costs. Such efforts initially involved both artisans and miners. We have already seen that mine managers infringed the mining regulations with impunity by compelling mineworkers to work on Sundays. In June 1901 the Mine Managers' Association formally abolished overtime rates, which had previously been paid at time and a quarter or time and a half: "all overtime in the future, whether on week-days or Sundays, should only be paid for at the ordinary rate".¹⁶⁰ The suspicions of white mineworkers intensified: they viewed management as being intent on whittling away the palmy conditions they had largely enjoyed under Kruger. In March 1902, without negotiation, management on the

Crown Reef summarily introduced piecework, so provoking a strike by the artisans which had a successful outcome for the workmen.¹⁶¹

Miners on the Crown Reef were not affected by the strike as the new piece payments applied only to mechanics in the workshops.¹⁶² Nor did the miner object to piecework; his contract was a form of piece payment. Even so, management's attempts to reduce artisans' wages alerted miners to the need for organisation: they believed that their wages, too, would soon be under siege, as the payment of 5s, 7s. 6d and 10s per day to former members of the irregular troops, who were novice miners, indicated.¹⁶³ In May 1902 professional miners speedily formed a union - the Transvaal Miners' Association.¹⁶⁴

Contrary to past practice, the overseas miners did not organise on industrial lines. Instead, as their first rule book indicates,¹⁶⁵ they founded an organisation based on craft union principles. Their objectives stressed negotiation and conciliation, but not radical strike action.¹⁶⁶ Also, the union's condition for membership was the miner's possession of a blasting certificate: the union considered the certificate to be the equivalent of an artisan's trade qualification.¹⁶⁷ It was not until 1910, when Tom Mann, the Secretary of the British Independent Labour Party, visited South Africa, that the Transvaal Miners' Association widened its ranks. Mann convinced the miners of the need for organising on industrial

lines; and they admitted the "semi-skilled" gangers as members of their union at "cheap rates".¹⁶⁸

In 1902 miners on the Witwatersrand were uninterested in general unionism; their priority was skilled trade protection. The initial boom in gold mining shares was collapsing rapidly, largely because of the shortage of African labour. Although there was no scarcity of jobs for miners,¹⁶⁹ by September 1902 the market was "glutted" with artisans: "financial depression prevailed".¹⁷⁰ Conflicting reports were circulating in the United Kingdom; while seven hundred immigrants, whom the Colonial Office had "encouraged" to leave Britain, were "stranded at Cape Town",¹⁷¹ Milner was advising Chamberlain to stop "advertising" for artisans.¹⁷²

As miners surveyed the plight of artisans, they feared that they, too, would be unemployed. They believed that the "want" of African labour would cause many mines "to fall idle". Under recession, which was already imminent by the middle of 1902,¹⁷³ they correctly predicted that the depression would be "twenty times worse than under Kruger".¹⁷⁴ The miners' need to organise had become apparent. Also, their working condition had changed "for the worse since Kruger".¹⁷⁵ As management had stopped their "dinner breaks",¹⁷⁶ in addition to all the other new inequities, they now worked a full ten-hour shift.¹⁷⁷ More important, their long hours underground made them specially vulnerable to the newly discovered

occupational disease, accelerated silicosis.¹⁷⁸

In promoting the need for organisation, the founders of the Transvaal Miners' Association stressed the "dire calamity" of silicosis.¹⁷⁹ Besides providing customary craft union benefits,¹⁸⁰ the objects of the new union were therefore to "protect men's lives by urging legislative enactment and to provide union funds to finance treatment for miners in hospitals and convalescent homes, "thereby placing members out of reach of charities".¹⁸¹ In the view of the office bearers of the union, such provisions were all the more necessary, as the "scourge" which had fallen upon miners was a "question" with which "neither industry nor the government had attempted to grapple".¹⁸²

As soon as the mines began producing in May 1901 mine managers were dismayed to discover that many of their former skilled miners, in particular rock drillers, had not returned to the Witwatersrand. Mine managers required their services to restart production: skilled miners were one of the main requisites for the industry's renewed progress.¹⁸³ On making personal and informal enquiries from miners who had returned to the Rand as to the whereabouts of their former friends and fellow-workers, the mine managers learned that most of the missing rock drillers were dead. They had died either overseas, in Britain and Europe, or in the coastal towns of South Africa, the places to which most miners had retreated at the beginning of the war.¹⁸⁴ On collating the

figures at meetings of the Association of Mine Managers, management was alerted to the serious implications of its survey: "since the beginning of the 'War' there had been a great mortality among the Rock Drill Men, which doctors advised was due to "the clogging of the lungs by dust".¹⁸⁵

The prevalence of accelerated silicosis was not merely a war-time phenomenon. In 1899, shortly before the outbreak of war, Witwatersrand doctors had noticed an increase in the number of youthful silicotic miners.¹⁸⁶ But they had not advised the mining authorities or the miners to take special precautions. Instead, they had recommended that their patients quit their occupation. Richard Barry, John X. Merriman's nephew and the manager of the Nourse from 1911 to 1915, who had been working as a "practical man" during the pre-war years, received similar advice:

I was personally advised by Doctors [W. G.] Rogers and [E. T.] Hamilton a year before the war, to stop working as a miner because I was becoming effected [sic] with a new disease which they were then just beginning to realize, a disease of the lungs.¹⁸⁷

In 1899 few visible deaths from silicosis occurred on the Witwatersrand. Most miners, who were severely disabled by the disease, left the Reef: although death was often imminent, they tried to recuperate by returning home or taking a holiday in the South African coastal towns.¹⁸⁸ Also, when deaths from the disease occurred on the Witwatersrand,

doctors invariably recorded the immediate cause of death, notably pneumonia or "phthisis", and not the primary cause, which was silicosis.¹⁸⁹ Clearly, had it not been for the war, the discovery of the prevalence of accelerated silicosis would have been further delayed.

In 1901 the mine managers reported their findings on the mortality of rock drillers to the Department of Mines, which immediately conducted an investigation. The results of the investigation confirmed the survey of the Association of Mine Managers. Although the Government Mining Engineer reported the inspectors' findings in his annual report for the half-year ending December 1901,¹⁹⁰ the report, like other government reports at that time,¹⁹¹ was published only six months later, at the beginning of June 1902.¹⁹²

The investigation conducted by the mine inspectors covered the period October 1899 to March 1901, a period of one and a half years. The investigation also embraced the whole of the Witwatersrand: it included the mining districts of Johannesburg, Germiston and Krugersdorp, that is the Central Rand and the East and West Rand.¹⁹³ Its findings showed that out of 1 477 rock drillers, the total number of machine men employed in October 1899, 227, or 16,5 per cent, "were known to have died". Also, the rock drillers' average age of death, at thirty-five years was, according to actuarial computations, "7.8 times higher than that which should

obtain in an ordinary trade from all causes".¹⁹⁴

Although extremely serious, the mortality figures were inaccurate:

The number of known deaths did not coincide with the number of those who failed to answer to their names; far from it. There does not appear to have been a strenuous effort made to follow up all the missing, for the general cause of the decimation was felt to be sufficiently revealed by such returns as were readily obtained. In nearly every case the physical collapse was traced back to miners' phthisis.¹⁹⁵

Undoubtedly the Department of Mines did not conduct a thorough investigation. Six months after the publication of his 1901 report, Weldon, the Government Mining Engineer, in his half-yearly report for January to June 1902 conceded the point.¹⁹⁶ Also, in 1907 R. J. Gluyas claimed that the survey had not been comprehensive. A consulting engineer and brother of the mine manager of the Jubilee, Gluyas in 1901 conducted a private investigation of his own. He found "400 men's names" who had died during the eighteen-month period, from October 1899 to May 1901.¹⁹⁷

The Inspector of Mines of the Johannesburg District misinterpreted his findings: he miscalculated the length of the period under survey, so causing the average annual death rate of rock drillers to be seen as lower than, in fact, it was. His inaccuracy, perhaps unwitting, is all the more serious because contemporaries and later historians often quoted his statistics as being definitive for the turn of the

20th century.¹⁹⁸ In 1903 even the Haldane Commission sitting in Cornwall did not notice his mistake;¹⁹⁹ the British commissioners did not check the Transvaal inspector's figures.

The report of the Johannesburg Inspector of Mines was dated 3 March 1901. His survey therefore covered one and a half years and not two and half years, as he claimed.²⁰⁰ Consequently the "general average of 17.2 % dead in 2.5 years", which the inspector of mines worked out to be "an average of 6.9 % per annum",²⁰¹ is wrong. Instead, the average annual mortality was nearly double that of the inspector's calculations: it was 11.49 per cent per annum. Also, given the haphazard research of the Department of Mines, the average annual death rate of rock drillers from accelerated silicosis was undoubtedly considerably higher than 11.49 per cent per annum. If we accept Gluyas's estimate as being accurate, 27 per cent of a specific group of miners, the pre-war rock drillers, had died in eighteen months.

From the beginning of 1901 until the middle of 1902 the newspapers did not mention the mortality amongst rock drillers; no articles and letters addressed the issue and there was not a single editorial. Nor did the 1900-1902 *Annual Report of the Transvaal Chamber of Mines* comment on the problem:²⁰² the publication of "unpalatable facts" certainly did not, at this critical time, "suit the policy of the Government and the mining houses".²⁰³ Neither the

state nor the mineowners wanted to deter potential investment by indicating that there was an impediment to the industry's methods of mining. Also, neither party wanted to create "misapprehensions" concerning the industry "in the minds of its all too ready detractors".²⁰⁴

Despite the lack of press coverage, the mortality of rock drillers, which had occurred during the war, was common knowledge in mining circles on the Witwatersrand.²⁰⁵ Although members of the Reef mining community were conspicuously silent about the problem in public, many of them privately expressed concern. Their confidences were similar to those of C. B. Saner, a regular member of the Chemical, Metallurgical and Mining Society of South Africa:

I know that before the war, out of 35 or 40 [miners] I was personally acquainted with no less than 15 men died.²⁰⁶

Francis Fox, a Cornish mining engineer, who had spent some time during the 1890s on the Witwatersrand, described his experiences with the victims in Cornwall, after they had returned home during the war:

I may state that I was personally connected with a certain heading which was being driven by a gang of miners - all fine powerful fellows - and yet within a comparatively short time every one of them died of consumption. The last survivor came to my house for some weeks, and it was pathetic in the extreme to hear him speak of his dead comrades and to know that so soon he was also to be in his grave.²⁰⁷

Miners, too, were not immune to the enquiries and the rumours, which swept across the Reef.²⁰⁸ Within

the first year of their return to the mines they witnessed on the Witwatersrand the deaths of many of their friends. "During the first twelve months after the resumption of work," as Irvine observed, "many of the remainder [of rock drillers] went to swell the grim tota . . . Irvine's evidence for his bleak conclusion were his observations, between June 1901 and November 1902, in the Johannesburg Hospital. During the eighteen-month period Irvine noted that of the ninety-three males, who had died from chest diseases, forty-three were miners.²¹⁰ Dr Norman Fern's observations confirmed Irvine's findings. According to Fern, between 1 July 1903 and 20 November 1904 twenty-two out of thirty-two miners admitted to the Johannesburg Hospital suffering from silicosis had died; Fern's prognosis for the remaining ten patients was "hopeless".²¹¹

From 1901 onwards, according to the *Cornubian*, the funerals on the Reef of miners, who had succumbed to the "white death", were a weekly occurrence:

On the previous Sunday three miners were buried in Johannesburg side by side, leaving families behind. The following Sunday three more miners died, and the public verdict was (says a foreign correspondent) "Death from millionaire economy".²¹²

But these were only the visible fatalities from silicosis, some of which were recorded in the Cornish newspapers, mainly because of the dead miners' ties to the British county.²¹³ As they contributed to the victims' funeral expenses,²¹⁴ the Witwatersrand miners

were aware of many such deaths amongst both Cornish and non-Cornish miners. The general public, however, was oblivious to the numerous deaths of rock drillers in its midst: the local newspapers did not report em.²¹⁵

Of equal significance were the inconspicuous deaths of numerous miners who, when sick or incapacitated from silicosis, had returned to Britain and Europe.²¹⁶ The residents on the Reef did not witness their burials. Unless they were intimately acquainted with the deceased, the members of the Witwatersrand mining community did not know that the miners had died abroad.²¹⁷

Not unnaturally during 1901 miners were "all getting anxious now".²¹⁸ The mortality from the disease deterred some miners from returning to the Witwatersrand and caused others, who were present on the Reef, to be "reluctant to enter the mines".²¹⁹ To counter the miners' anxiety, in September 1901 the Association of Mine Managers asked the Chamber of Mines to insert "paragraphs" in the local press and in those overseas newspapers that fed the "labour areas". The intention of the advertisements was to reassure the rock drillers that the industry was implementing preventive measures to stop miners from inhaling dust.²²⁰ In August 1901, when the mine managers had consulted the Transvaal Medical Society, the doctors had instantly identified dust as being the main cause of the rock drillers' incapacitation and

death from silicosis.²²¹

Management regarded the idea that dust was the cause of the disease as being only a generally accepted assumption; in its view doctors had not scientifically established the cause. They were reluctant to accept the findings of pathologists, who had no doubt that dust was the cause of the disease. It was not until 1912, when the Van Niekerk Commission, also known as the Medical Commission, investigating "miners' phthisis and pulmonary tuberculosis", presented its report,²²² that the Chamber of Mines eventually agreed that the results of the pathologists constituted "definite information".²²³

In August 1901 a sense of "urgency" motivated the Association of Mine Managers to convene a meeting with the Transvaal Medical Society for advice on preventive measures.²²⁴ But the mine managers' initial sense of immediacy was short lived. They made the date of the next meeting with the doctors, for further action and deliberation, for more than six months later - in March 1902.²²⁵ In March both parties were apparently confident that they could control the situation;²²⁶ the doctors urged the mine managers to allay the dust with water; the Association of Mine Managers wrote to the Chamber recommending "strongly" the implementation of the "remedial measures".²²⁷ Neither organisation viewed the problem as being serious enough to warrant a public investigation.²²⁸

In evidence to the Weldon Commission in December 1902, the Transvaal Medical Society stressed its co-operative role with the Mine Managers' Association and emphasised their joint concern.²²⁹ But in 1901 and during the first half of 1902 both the doctors and the mine managers, in fact, approached the issue in a rather leisurely fashion. It was only after June 1902 that both organisations acted more decisively than they had in the past few months: in Britain, the adverse publicity concerning the mortality from the disease compelled both the professional bodies to show more resolve. The change of attitude, as we shall see later, was of short duration. After the Weldon Commission had presented its report, both societies focused on other issues; after 1903, for most doctors and mine managers, silicosis was no longer a pressing problem. Even so, despite their dilatory approach to the problem after 1903, the mine managers were undoubtedly far more assertive about the need for dust prevention than their employers, the mineowners.

The first instance of the doctors' new sense of resolve occurred in August 1902, only after a worried deputation from the Transvaal Miners' Association had interviewed Francis Napier, the President of the Transvaal Medical Society. He agreed to ask the doctors to assist the miners. In the face of the unabating mortality from the disease amongst rock drillers, the miners' union wanted the medical profession to influence the industry to institute

sound preventive measures against silicosis. Also, the Transvaal Miners' Association wanted the doctors to urge the government to provide medical attention and accommodation for the handicapped miners, most of whom were "destitute".²³⁰ The Transvaal Medical Society therefore, on its own initiative, appointed a sub-committee of six doctors to collect evidence on the "rate of mortality". Also, to counter the scepticism of management that dust was the primary cause of silicosis,²³¹ it conducted as many autopsies as possible of the "lungs of miners dying from the disease to show the real cause of the disease".²³²

As a formality, the Transvaal Medical Society communicated its plans to the Association of Mine Managers, which agreed to assist the doctors with their investigations.²³³ Although the doctors completed their report in less than two months, they did not publish their findings. Nor did they send the report to either the Transvaal Miners' Association or the government. It was at this point that the doctors' temporary resolve vanished. Although the Transvaal Medical Society "had it [the report] in its possession months before the Commission was ever thought of",²³⁴ it lacked the courage to publish its findings to a sceptical, perhaps hostile, public; their conclusions implicitly criticised the industry's methods of mining. But the doctors were prepared to present them to the Weldon Commission, because the official enquiry sanctioned open discussion of a

subject which was singularly "notorious" amongst mining circles.²³⁵

Until August 1902 the press did not inform the public that there was "inclined to be a scare on" amongst the miners.²³⁶ In February 1902 the Star published the annual report of the Association of Mine Managers, in which mention was made of the efforts by management to allay the dust with water.²³⁷ Also, the Star published a letter by an "underground workman", who responded to the press report of the mine managers' annual meeting. The author, an anonymous miner, who did not want to be victimised, expressed doubts about the efficacy of the mine managers' preventive measures.²³⁸ Except for these two publications, the mineowners' newspaper, the Star, was silent on the subject of silicosis.

After the reopening of the mines many doctors probably had experiences similar to those of W. D. Frazer: he consulted with "150 miners who had distinct signs of Miners' Phthisis".²³⁹ Even so, the medical profession, like management and the Department of Mines, kept singularly quiet about the problem. As we shall see, until the Weldon Commission heard medical evidence in December 1902, only one Witwatersrand doctor addressed the problem: in an article to the Star he expressed his personal concern over the high prevalence of silicosis and stressed the need for preventing the disease.²⁴⁰ Not a single doctor on the Witwatersrand communicated the mortality rate from the

disease to a medical journal.²⁴¹

As we have seen, as soon as miners returned to the Witwatersrand in 1901, they were alerted to the risks of accelerated silicosis: they rapidly learned about the premature deaths of rock drillers, which had occurred during the war. But they continued to work on the Witwatersrand gold mines, partly because of their ability to rationalise the undue severity of the death rate. Initially they attributed the onset of accelerated silicosis to the dampness of the climates in Britain and at the South African coastal towns: they believed that in the moist atmospheres of such places the disease became "more noticeable".²⁴² Before the Weldon Commission dispelled the misconception,²⁴³ the rationalisation was both convenient and a source of relief for supporters of the industry and for the Department of Mines.²⁴⁴ The rationale exonerated the Witwatersrand gold mines from their responsibility for the disease.²⁴⁵

Another rationalisation, favoured by observers of the mineworkers, was that the miners deliberately gambled with their health in return for relatively high money wages:

They [miners] spoke of the dust in their lungs as gamblers speak of stocks and shares when the market is depressed. Most of them hoped that one day they would get away, before their lungs were badly affected. Very few really came to a determination; they seemed incapable of putting a period to their servitude by an act of will. It was as though they were in the grip of a power which had completely enslaved their will to itself.²⁴⁶

As we have seen, many miners did, indeed, view the Rand as a temporary place of work. They hoped that their relatively high money wages would enable them to accumulate a little capital for investment in permanent residence elsewhere.²⁴⁷ After they had been alerted to their vulnerability to accelerated silicosis, miners, by continuing to pursue this goal, clearly took into account the risk of contracting the disease. Even so, most miners did not gamble "recklessly" with their health, as John X. Merriman later alleged.²⁴⁸ The development of the disease, with its initial slow progression, gave them little or no intimation of the appropriate time for them to quit mining.²⁴⁹ Therefore their decision to stop working on the Witwatersrand was not a simple question of gambling with time. Until the damage was irreparable, miners were completely unaware of the injury to their lungs. Nor could doctors, who had great difficulty in diagnosing the disease, authoritatively advise miners to give up their occupation.

It was a not uncommon experience for a gold-miner on the Rand to be pronounced fit for work, after a careful examination, and yet to die from miner's [sic] phthisis 8 or 9 weeks later.²⁵⁰

Accelerated silicosis was so "insidious" that its sudden and rapid progression, as Sir Thomas Oliver illustrated, both horrified laymen and stunned the medical profession:

On examining the first patient the subject of gold-miners' phthisis I was struck by the healthy bronzed appearance of his skin. The man looked as if he had been exposed to the sun and the weather. He had the appearance

of a man in good health, and yet he could not walk a few paces without panting...Within a few months this patient died, the pulmonary symptoms having become progressively worse, and yet there was nothing like the emaciation of the body that is observed in ordinary tuberculous phthisis. What is peculiar to "gold" or "Rand miners'" phthisis is its subtle origin and development. The unobtrusive manner in which the disease invades the lungs without producing symptoms is a noteworthy fact, but once the disease has gained good hold upon the lungs, circumstances at any moment may arise to cause marked ingravescence of the physical signs and symptoms.²⁵¹

With accelerated silicosis the miner did not feel that he was "really ill" until he was "practically speaking past all work".²⁵² Also, it was only at this advanced stage of the disease that miners tended to consult doctors.²⁵³ By now the miner had no alternative other than to quit mining; he was "practically incapacitated from hard work for the rest of his life",²⁵⁴ the duration of which was "a few months or years".²⁵⁵ The life-span of a severely handicapped miner was, at best, two years. If tuberculosis supervened, he usually did not survive another six months.²⁵⁶ Accordingly, although miners on the Witwatersrand knew that they were taking a chance with their health, clearly they did not gamble recklessly with their lives; it was impossible for them to know beforehand when to stop mining.

As they had no alternative form of livelihood, most miners had no option but to risk their health.²⁵⁷ In 1902 a realistic miner stated bluntly:

The miner knows quite well when he is beclouded with dust, emanating from a rock drill, that he is inhaling what is injurious to his health. And he also knows that there is one alternative only, viz., starvation

and poverty for his family if he discontinues.²⁵⁸

The money wages on the Rand, which were higher than those paid at any other mining centre in the world, lured the overseas miners to improve their material position. But the hope of earning high wages also hastened them to their graves "for the sakes of the home and the family".²⁵⁹

Until the unsuccessful miners' strike of 1907 most overseas miners did not leave the Rand. The hope of material advancement and a sense of fatalism shaped their decision to work here. From 1901 to 1907 "old, middle-aged and young, robust, strong and active men, husbands, brother, fathers, the cream of miners from all over the world" came anew, or returned, to the Witwatersrand.²⁶⁰ Together they faced a "menace" which "seemed less terrifying by reason of the fact, perhaps, that it was shared by so many thousands of fellow-creatures".²⁶¹

But the threat of silicosis was ever-present: healthy miners heard their comrades coughing and regularly attended funerals. Although they had no need of tangible reminders, some miners, like James Nicholson, carried bizarre objects as emblems of their fate. Nicholson, a "bluff and hearty young man" and an executive member of the Transvaal Miners' Association in 1902,²⁶² always kept in his "waist-coat pocket" a "stone", which was, in fact, the hardened piece of lung from a dead miner.²⁶³ In 1902, during the Village Main Reef strike, Nicholson, while making

a speech to emphasise the "awful results of rock drilling", with dramatic gesture showed it to the mass meeting.²⁶⁴ In August 1913, in the aftermath of the general strike on the Witwatersrand, R. L. Outhwaite, the "anti-capitalist" MP for Hanley,²⁶⁵ spoke of the "stone" in the House of Commons.²⁶⁶ Outhwaite, an Australian and formerly a radical journalist on the Rand, had witnessed Nicholson's rhetorical gesture in 1902.²⁶⁷ But Nicholson did not live long enough to see his symbol of danger become a legend in his life time. The "stone" was, indeed, a portent of his own death. He died in April 1908 a few days after resigning his commission as the representative of the Transvaal Miners' Association on the Mining Regulations Commission.²⁶⁸

Despite their sardonic jokes and their outward appearance of insouciance, after the Anglo-Boer War the attitude of the Witwatersrand miners towards their vocation changed. Once they realised that the average working life of the rock driller on the Reef was a mere seven years, feelings of anger and resentment towards conditions of mining on the Witwatersrand co-existed and conflicted with their fatalist attitude.

During the 1890s, although miners were generally aware of the injurious nature of dust, a sense of fatalism, as we have seen,²⁶⁹ accompanied their compliance with their working conditions. Also, the miners' "passiveness" to excessive dust levels had

stemmed from their "ignorance":²⁷⁰ they were unaware that they were vulnerable to accelerated silicosis, which differed so sharply from the chronic "miners' asthma" to which they were long inured. Despite their disregard for the health of their employees, during the pre-war period most of the mineowners were also apparently unaware that rock drill work could cause accelerated silicosis.²⁷¹ Even the outspoken critic of the Randlords, the independent consulting mining engineer, E. J. Moynihan, gave the mineowners the benefit of doubt.²⁷²

The fatalism of miners was an attitude which helped them to defend themselves against the reality of their daily dangers and to distance themselves from the reality. They sublimated their fears in carousing and gambling or reverted to moods of despondency which they tried to anaesthetise with alcohol.²⁷³ The mineowners and the general public interpreted such activities as wanton indulgence - the result of unduly high wages.²⁷⁴ The disparaging comments in 1913 of Sir William Bisset Berry, the Union parliamentary representative for the constituency of Albany, illustrates the clash of the two world views:

They [miners] require many things which many men usually pride themselves in doing without. Copious "drunks", bioscopes, whippet fights, theatres, cab fares, cafe teas, north excursions, tricks of various sorts and, I suppose, life in the stars for the many single men all lead to the spending of cash and to depreciate the real value of wages...²⁷⁵

After the Anglo-Boer War, when the Witwatersrand miners had learned of the high mortality amongst their contemporaries, many of them were no longer as "passive" to their dangerous work conditions, as they had been in the past. The risk of premature death at an average age of thirty-five, combined with the mineowners' reluctance to implement thorough preventive measures against silicosis, intensified the miners' hostility towards their employers. Also, feelings of resentment and anger with the conditions under which they were obliged to work gradually replaced the miners' former fatalism towards the hazards of mining. They no longer viewed high money wages solely as an inducement to come to South Africa. Instead, miners also regarded their relatively high wages as danger money, or risk pay.²⁷⁶

From 1901 onwards any attempts by management to reduce miners' wages or to extend miner productivity generated amongst the miners on the Witwatersrand a militancy, which had been absent during the 1890s. Their fear of contracting accelerated silicosis helps explain their opposition to the white labour experiments conducted by F. H. P. Creswell, in particular, on the Village Main Reef in 1902. On 25 September 1902, the rock drillers, with the sanction and active support of most of the executive of the Transvaal Miners' Association, went on strike on the Village Main Reef.²⁷⁷ Their anger at being the victims of a preventable occupational disease was an important

reason, although not the sole one, that prompted them to strike.

The shortage of African labour caused many mining houses in August 1902, as a temporary expedient, to employ unskilled white labourers, many of whom were ex-irregulars and indigent Afrikaners, in a number of jobs formerly performed by black underground mineworkers.²⁷⁸ Within a short time of the start of their "apprenticeship" Creswell, the manager of the Village Main Reef, permitted the white labourers, employed at 5s per day, exclusive of board, to operate the rock drills under the supervision of the professional miners. Also, Creswell increased the number of machine drills under the supervision of each rock driller. He now made each rock drill supervisor responsible for three machines operated by six newly recruited unskilled white labourers: the rock drill supervisors were accustomed to oversee only two machines with the help of five black assistants.

The overseas miners undoubtedly viewed Creswell's scheme as job fragmentation. They argued that the innovation would result in all-round wage reductions for white miners.²⁷⁹ Also, they feared that the demand for professional miners would decrease.²⁸⁰ They believed that management would employ semi-skilled machine operatives, at lower than customary wages, in preference to all-round miners, who had been trained in the traditional way. They correctly anticipated that within a mere three months novice miners would be

able to pass the theoretical test which entitled them to a blasting certificate.²⁸¹

Creswell's rapid promotion of unskilled white apprentices to rock drill work at 5s per day intensified the professional miners' opposition to the white labour policy on the mines.²⁸² In 1905, with the possibility of representative government and the holding of elections, the Transvaal Miners' Association distanced itself from the craft unions' political co-ordinating body.²⁸³ As we have seen, in 1908 most miners opposed the major plank of the craft unions' electoral platform, namely the "White Labour Policy".²⁸⁴ The craft unions regarded the "White Labour Policy" as being applicable to the miners' jobs, particularly those which involved the use of machine tools, including rock drills.²⁸⁵ But most professional miners resisted the suggestion. They believed that the substitution of whites for Africans as rock drill assistants would reduce the wages and would diminish the status of skilled miners.

Of equal importance, in 1902 the overseas miners on the Village Main Reef emphasised that the supervision of three drills would increase their vulnerability to silicosis:

The question of health was a most serious one, and the deleterious effect of putting three rock-drills in a small space was something dreadful to contemplate.²⁸⁶

As Creswell refused to withdraw the new condition, the supervisors, accompanied by the rock drill helpers,

went on strike. Management, which refused both to negotiate with the Transvaal Miners' Association and to acknowledge the strike, declared a lock-out. Ironically, Creswell had earlier told his directors that the white labour experiments would prevent united strike action by machine drill operators. Creswell believed that the supervisors and their assistants had widely divergent interests.²⁸⁷

During the strike the Transvaal Miners' Association went to great lengths to create a public awareness of the prevalence of silicosis. This grievance was closely tied to the other complaints of the strikers. The executive of the organisation therefore seized the platform, which the strike provided, in the hope that public pressure would compel state intervention with respect to the problem of silicosis. Already the miners' dealings with the Department of Mines had shown that its senior personnel, unlike their republican predecessors, were unsympathetic towards, if not biased against, miners as a group. Also, the local public was both uninformed and indifferent. The Transvaal Miners' Association assessed correctly that the only way it could achieve its aims was through active demonstration: self-advertisement was the route it took in the hope of alerting both the local and the British public to the ravages of the occupational disease.

Accompanied by Wybergh, the Commissioner of Mines, Milner, at a meeting with a deputation from the Transvaal Miners' Association, acted as spokesman for the state.²⁸⁸ He refused to intervene in a dispute between management and the miners. Also, he dismissed the miners' complaints as being without substance. More important, Milner refuted the miners' argument that the supervision of three drills would increase the death rate from silicosis amongst rock drillers: he denied the "self-evident truth" of the miners that under the new system rock drill supervisors would be exposed to increased dust levels.²⁸⁹ In contrast, W. S. Caine, the MP for the constituency of Camborne in Cornwall, viewed the ravages of silicosis as being highly pertinent to the grievances of the strikers.²⁹⁰ Unlike the *Star*, the mouthpiece for the Chamber of Mines, Caine did not scorn the miners' "irrelevant rhetoric about the Braamfontein cemetery".²⁹¹ Caine believed Edward Perrow, the President of the Transvaal Miners' Association, who said: "I do not want to go to the cemetery."²⁹²

Although unsuccessful, the Village Main Reef strike established several precedents relevant to this study. First, miners went on strike over an important health issue - their vulnerability to accelerated silicosis. Second, although the strikers did not explicitly state that they earned danger money, they feared that their risk pay would be reduced: this fear was an important reason that the miners resisted

management's innovation. Finally, as we shall see later, whenever management tried to increase worker productivity by compelling rock drill supervisors to oversee three machines instead of two, the miners resorted to strike action. In every case one of the reasons that prompted the miners' opposition to overseeing three drills was their belief that the supervision of additional machines intensified their proneness to mortality from accelerated silicosis.

Management consistently dismissed the miners' view. But the Mining Regulations Commission, despite its equivocation, in its final report in 1910 implicitly vindicated the miners' unswerving belief in the relationship between increased rock drill supervision and the exacerbation of their vulnerability to silicosis. The commissioners stated:

Stripped of all sentiment, the position was fairly put to the Commission by Mr. Tom Mathews, one of the representatives of the Transvaal Miners' Association...He said, in effect, that under the present conditions of mining, which in his opinion were very unhealthy, he would not advocate the use of more than two machines per man, but that, personally, he would be willing to work six machines if underground conditions were altered in such a way as no longer to be a menace to the health of the miner.

The question, therefore, resolves itself into one of health conditions, underground, and has nothing to do with the physical capability of the miner to supervise more than two machines. Improve your health conditions and the question becomes one of practical mining, depending upon the physical capability and efficiency of the average miner...The Commission can only hope that the adoption of the recommendations contained in this report will have the effect of so bettering the health conditions underground as to preclude

the question being reopened in the form
above stated.²⁹³

In October 1902, however, when the the Transvaal Miners' Association interviewed Milner "praying for an inquiry into the causes of this high mortality",²⁹⁴ the miners had only anecdotal evidence for their claim that the supervision of extra rock drills increased their exposure to dust. Also, apart from the laconic statement of the Government Mining Engineer in his six-monthly report, which briefly noted the mortality amongst Witwatersrand rock drillers during the war, the public had no official intimation of the ravages of the disease. Milner and the Department of Mines preserved a conspicuous silence on the problem of silicosis.

At the end of October 1902 Milner informed the Colonial Secretary, Joseph Chamberlain, that at the beginning of September "arrangements had been made for the appointment of a thoroughly representative Commission" to investigate the problem of silicosis. Milner further promised to send the findings of the commission to Chamberlain as soon as he had received them.²⁹⁵ Also, early in October, when he met the deputation from the Transvaal Miners' Association during the Village Main Reef strike, Milner intimated that an investigation of the disease was in the offing.²⁹⁶ Despite his protestations of good faith, Milner was undoubtedly temporising. Throughout September and until nearly the end of October he did nothing about forming the commission. Nor did he sound out potential commissioners as to their

willingness to serve on such an enquiry.²⁹⁷ Only on 7 November 1902 did Milner formally gazette the commission and announce the names of most of the commissioners.²⁹⁸

In October, when Milner told the Colonial Secretary that he had already, before September, appointed a commission, it is difficult to believe that he was lying to Chamberlain. Earlier he may have given the issue consideration, but vacillated about implementing it. Nevertheless, even in October, the enquiry "was in name only".²⁹⁹ It is possible that Milner procrastinated because of divisions of opinion amongst the senior officials of the Department of Mines as to the advisability of such a course of action. In July 1902 Wybergh, the Commissioner of Mines, strongly advised the appointment of a commission.³⁰⁰ Unlike Weldon, Wybergh's previous record indicated that he was kindly disposed towards the white mineworkers. In 1899, for instance, "he had ended a strike in favour of the working class men".³⁰¹ In July, too, Weldon, the Government Mining Engineer, apparently supported the idea. July was a crucial time. Weldon's report had been recently published and was therefore available to interested parties both locally and in Britain. Also, by July the publicity which the British press, particularly the influential *Mining Journal*, had given to the mortality from the disease had filtered through to the Witwatersrand: the prevalence of the disease was no longer an open secret

confined to mining circles on the Reef.

But during July the publicity faded. The *Mining Journal* and its correspondents focused on other matters; and the policy of the local press remained unchanged: they refused to address the problem. The report of the Government Mining Engineer received a brief mention in the *Star* on 2 June.³⁰² Admittedly the report was released on the same day that peace was finally declared. Even so, in later editorials both the editors of the *Star* and the *South African Times, Commerce and Industries* paid no attention to the report's brief but serious findings concerning the mortality of rock drillers.³⁰³

By August, when the public focus, particularly in Britain, on "Rand gold miners' phthisis", appeared to have shifted, Weldon changed his mind about the wisdom of holding an official enquiry: he rationalised to Dr John Law Aymard: "there would be no evidence to take".³⁰⁴ Aymard was pressing Weldon for a commitment on a commission, as Weldon had earlier told him that he would be one of the medical commissioners.³⁰⁵ Aymard's qualification for this appointment was an article which he had written on the causes and prevention of silicosis. He had shown it to Weldon and both had agreed that it be published as an appendix to the Government Mining Engineer's forthcoming report, for January to June 1902.³⁰⁶ Weldon's reluctance to hold a commission so infuriated the Krugersdorp doctor that in November 1902 Aymard

sent his article to the *Star* for publication.³⁰⁷

Aymard was undoubtedly a self-seeker: he liked publicity; and he also wanted the respirator, which he had invented, to be widely advertised.³⁰⁸ Even so, he was the only Witwatersrand doctor who attempted to publicise the problem in the local press. In response to Sir Thomas Oliver's important article in June, which we shall discuss later, in August 1902 one other South African doctor wrote a letter for publication in the *Lancet*. Significantly, the author, Dr D. Marshall, practised in Cape Town. His reason for writing the letter was to advise British doctors to warn their patients not to work on the Witwatersrand gold mines unless they were in "perfect health".³⁰⁹ Its thrust, therefore, was not directed at combating silicosis. After 1903 Aymard left the Rand to practise as a mine doctor at Pilgrims Rest.³¹⁰ When he returned to the Reef in 1910, he continued with his earlier attempts to advertise his respirator.³¹¹ Also, he resumed his mission of publicising the problem of silicosis.³¹²

Milner, like Weldon, was also indecisive, possibly indifferent, about holding a commission. It is conceivable that Milner thought that the "alleged prevalence" from silicosis was insignificant compared to the other problems which confronted the gold mining industry,³¹³ namely the shortage of African labour and the inordinately high mortality from disease amongst black mineworkers. As we have seen, in 1902 the mortality from disease amongst black mineworkers was

higher than 70 per thousand per annum, whereas the average mortality from disease amongst white mineworkers was approximately only 10 per thousand per annum.³¹⁴ The death rate from silicosis, which was confined to a small group of white underground workers, the rock drillers, was apparently insignificant compared to the death rate from pneumonia amongst both surface and underground African mineworkers.

Had the miners been dying of an infectious disease which placed the community, particularly the white community, at risk, the doctors and the government would undoubtedly have reacted quickly. Such a reaction is illustrated by the scare in Johannesburg which the outbreak of bubonic plague created in 1904.³¹⁵

Towards the end of March 1904 doctors identified a virulent form of bubonic plague amongst the Indian community in their "location" at Fordsburg. Doctors and the government immediately put into operation contingency plans, which had anticipated such an occurrence. Victims and those suspected of having the infection were transported seven miles from Johannesburg to an emergency site at Klipspruit, where a tiny small-pox lazaretto was situated. Motivated by Mohandas Gandhi, then practising as an attorney in Johannesburg, the Indian community generously subscribed £1 000 for the building of a small hospital at Klipspruit. Adjacent to the sewerage disposal

works, the "Sanitary Farm", Klipspruit was "a noisy spot". But because the land was "cheap" and remote from Johannesburg, the municipal health authorities considered it to be a suitable site for an infectious hospital. Shortly afterwards, a "Native Location" was sited at Klipspruit.³¹⁶

More important, Milner wasted no time. He promulgated an ordinance to by-pass constitutional obstacles and authorised the immediate establishment of the Rand Plague Committee,³¹⁷ of which five members of the Chamber of Mines were participants.³¹⁸ The Colonial Secretary, Alfred Lyttelton, also urged the need for immediate action. Lyttelton believed "decisive measures must be taken without, I fear, reference to cost".³¹⁹

The Rand Plague Committee, which sat for four months, swiftly reported its investigations. Its preventive measures aborted the current epidemic and obviated the occurrence of later epidemics of plague. During the period 1905 to 1914 doctors rarely identified cases of plague on the Witwatersrand.³²⁰

The medical profession and the Witwatersrand local authorities also acted with concern and speed, when epidemics of small-pox threatened the white community in 1905 and 1906.³²¹ The Witwatersrand doctors, like their counterparts in Britain, were far more interested in preventive medicine involving germs than with disease prevention, including silicosis,

which involved non-bacterial causes.³²² Also, the Transvaal doctors recognised that their success in curbing infectious diseases could enhance their status as a profession. Infectious diseases were not confined to the working class: all sectors of the community, including those with wealth and power, were vulnerable to germs.

By contrast, both Milner and his successors, including the Transvaal government under Botha and Smuts, were indifferent to and seriously underestimated the average annual mortality from silicosis amongst white underground workers in general, and amongst rock drillers in particular. Contrary to the prevalent opinion of historians, Milner did not consider the death rate of rock drillers from silicosis as being a serious problem. Nor did he believe that a commission on silicosis was a matter of urgency. Had the Home Government not exerted pressure for an enquiry, it is probable that Milner would have further delayed the appointment of a commission. Indeed, he might have postponed the enquiry indefinitely.³²³

After the British press had exposed the issue of the mortality from silicosis amongst the Witwatersrand rock drillers, some of the mineowners felt obliged to make a public statement. A few may have been genuinely concerned. Most were obviously merely disconcerted. The Randlords conducted the affairs of large corporations which were responsible to overseas

shareholders, 81 per cent of whom in 1900 were from the United Kingdom.³²⁴ the shareholders were embarrassed by the deaths of Witwatersrand miners, especially because they were British subjects.³²⁵ At the beginning of September 1902, George E. Webber, the general manager of Rand Mines, a Corner House company, on behalf of the board of directors wrote an official letter to the Star. He reassured the public that his company was aware of the dangers and was taking active precautions to reduce the incidence of the disease. He listed the water preventives and mentioned where they were being used. Although there was "practically no stock of respirators in Johannesburg", Webber stated that they had been ordered and that when they arrived the company would compel all workers to wear them.³²⁶

Also, in October 1902 the Chamber of Mines announced a competition for the best "practical suggestions and plans for combating the causes" of silicosis.³²⁷ From 1 November it widely advertised the competition in the local and overseas press - in Britain, America, Australia and Europe³²⁸ - offering prizes of £500 and a gold medal, £250 and £100 for the three most suitable devices for preventing the disease. The two criteria for the contest awards were the applicability and the demonstrable practicality of the apparatus to the "existing system of rock drilling".³²⁹ The Chamber refused to concede that dust was the cause of silicosis, but indicated that this

was the "general assumption".³³⁰ The wording of the competition announcement did not deceive the miners: they were fully aware that the phrase, "to combat the causes" of silicosis was a "euphemism" for the correct phrase, namely "to rid the mines of dust".³³¹

The competition was not entirely an altruistic action by the Chamber to "encourage inventive enterprise".³³² Since mid-1901 the mine managers had claimed that they could "cope" successfully "with the injurious effects of fine dust".³³³ Instituting the competition was therefore also an admission that management's methods for allaying dust had been singularly unsuccessful. Some members of management privately conceded that many of the dust preventives, particularly respirators, were ineffective.³³⁴ But in public management dismissed all the miners' claims that most of the precautions were useless and were often more detrimental to their health than the dust itself.³³⁵ Instead, management held the miners, particularly rock drillers, as being responsible for their own liability to the disease.

The Government Mining Engineer, Weldon, initiated the public tactic of blaming the victims. In his 1901 report he stated:

The Mine Managers generally have recognised that some steps are necessary to combat this evil, but much will depend on the readiness of the employees themselves to adopt such precautions as may be recommended. In particular, I think it my duty to call attention to the great risks run by rock drill men through their habit of returning to the site of the explosion after a blast

before the noxious fumes have been sufficiently dissipated.³³⁶

Doctor, state officials and management were quick to follow suit. Indeed, victim-blaming reverberated throughout the Reef: all such parties transferred the industry's responsibility for the disease and its failure to prevent it to the miners, who were accused of being reckless, ignorant and conservative and unwilling to take precautions.³³⁷ "Next to the soldier," said T. Lane Carter, the manager of the French Rand, "the miner is the most careless of individuals and often neglects to use the safeguards provided for him."³³⁸

Shortly after the report of the Weldon Commission had been published, in 1903 the editor of the *South African Mines, Commerce and Industries*, in his resort to victim-blaming, was more vindictive than most other parties:

A greedy toll of youth has been taken by the Witwatersrand, and nowhere has death been so busy as amongst the miners. Possibly this may lead to further strictures at home from the *Jésorénte* parliamentarian and journalist. It may be well, therefore, before dealing with the report of the Miners' Phthisis Commission to obviate the Markhamianacal³³⁹ picture of gold-bugs like Timour-Mammon sitting on a pile of miners' bones. A walk among the tomb-stones in the cemetery will show only too vividly that of those who have died here by far and away the greater number have been young men in the prime of life. Naturally, then, we have an extraordinary incidence of mortality among miners, whose occupation disposes them to yet another condition of peril..."miners in Cornwall are well-known to have the highest death-rate from chest disease of any class in the United Kingdom." It is from such a source that our white labour is drawn, from a class whose life-history, if it does not actually show a general and inherited tendency to tubercular disease - Dr. [A. E.]

Miller [the Boksburg District Surgeon and mine doctor for the East Rand Proprietary Mines] said "their families were reeking with it" - must obviously give a less vigorous physical equipment to resist the diseases that have ploughed through the British army and buried so many of our "pioneers".³⁴⁰

In brief, in late 1902 management of the Witwatersrand gold mines and most of its allies were reluctant to accept the medical view that exposure to silica dust was the primary cause of the excessive mortality amongst young rock drillers. Also, social and economic alignments on the Reef were conducive to invoking victim-blaming tactics: supporters of the industry were intent on exculpating the industry for its responsibility for the prevalence of silicosis. Under such circumstances, at the end of October 1902 Milner, with the assistance of Wybergh,³⁴¹ appointed the commissioners to investigate the problem of the disease. On 7 November 1902, more than eighteen months after the Department of Mines had compiled its survey on the mortality amongst rock driller during the Anglo-Boer War, the official notification of the "Insanitary Areas Commission" was gazetted.³⁴² Milner had no option but to pursue such a course of action. Events in Britain compelled him to do so.

The premature deaths of Witwatersrand rock drillers, who had returned to Britain during the war, attracted the attention of medical officers and mining personnel in Great Britain. Not unnaturally the fatal disease was especially noticeable in Cornwall. In November 1901, one month before the Transvaal Government Mining Engineer submitted his report,

Nicholas Trestrail, a Cornish mining engineer and a member of the Redruth Urban District Council, wrote a letter to the *Mining Journal* in which he alerted the international mining community to the dangers of machine drilling. He stated that the life of the rock driller, who operated machines continuously without the use of water, was "much less than that of the ordinary miner"; the workman inhaled the "fine floating dust from boring rocks".³⁴³

In 1901, however, both the journal and its readers paid no attention to Trestrail's warning and the wet precautions he advised. Trestrail did not have established proof, but only anecdotal evidence, which derived from his personal observations of what had happened in the case of many Cornish miners:

It is surprising to see the number of men returning from foreign mines who in a comparatively short time continuously working rock drills are reduced from strong, healthy individuals, first to mere shadows, and then death.³⁴⁴

Trestrail's observations soon had medical confirmation. In his annual report, presented at the beginning of 1902, A. E. Permewan, the Medical Officer of Health for the Redruth Rural District Council, alluded to "the deplorable mortality" from "Phthisis":

Probably the deaths which ought to be reckoned as fairly belonging to the district itself have been beyond the average of a few years ago, but they have been added to in alarming extent by the mortality which has affected returned South African miners.³⁴⁵

Accordingly, both the Redruth Rural and Urban District

Councils instructed their Medical Officers of Health, Permewan and Frank Hichens, to investigate the matter. The local authorities required statistics to prove the assumption that the Witwatersrand gold mines were liable both for the increased mortality from silicosis in Cornish miners and for the markedly reduced average age at which miners were dying.³⁴⁶

While the Cornish doctors were carrying out their mandate, Sir Thomas Oliver, one of the physicians at the Royal Infirmary in Newcastle-upon-Tyne and the confidential adviser of the British government on industrial dangers,³⁴⁷ dropped his bomb-shell - he said that occupational disease could be more dangerous to the lives of workers than bullets to soldiers. Indeed, it was Oliver who was responsible for drawing the comparison between the mortality on the Witwatersrand gold mines and the mortality in war. Many contemporaries often repeated Oliver's claim that gold mining was more dangerous than war.³⁴⁸ In mid-1902, for instance, "More Dangerous than War" was the headline of an editorial in a Cornish newspaper.³⁴⁹ Even so, historians have not credited Oliver with the aphorism. Instead, they attribute its authorship to a variety of individuals.³⁵⁰

Oliver wrote a letter to the *Lancet* - it was published on 14 June 1902 - in which he graphically illustrated that the Witwatersrand gold mining industry was "very destructive to human life".³⁵¹ He positively identified dust and not alcohol as the

primary and sole cause of the malady. Also, by describing the rapidly progressive nature of the disease, he showed that it was an accelerated silicosis akin to the form to which stone masons and steel grinders had formerly succumbed: the disease "kills men when they are still comparatively young, usually before they reach the age of forty years". Finally, in the absence of medical cure, he advocated the need for prevention. Improved ventilation and the use of water were his two recommendations for the prevention of respirable silica.³⁵²

As an expert in the field of occupational medicine, Oliver had unimpeachable credentials. Also, he could tackle the issue objectively and from a position of strength: the coal mining industry, which predominated in the area in which he practised, had a relatively low prevalence of occupational disease. Therefore his motive for writing the article was plausible:

During the last two years, owing to the closing of the mines and the continuance of the war, miners have returned here [to the north of England] in large numbers many of whom have presented on their arrival the appearance of men broken down in health and who have sooner or later succumbed to pulmonary disease. It has been my fortune to have been consulted by some of these miners, whose lung affection had assumed the character of a veritable pulmonary fibrosis. Now that the war is over there will in all probability be a rush of miners once more to South Africa. I feel therefore that if attention can be drawn to the need of something being done to alter and improve the methods of mining in the Transvaal, and to the necessity for revising and strengthening the mining regulations of that country, the loss of many lives of miners

may by this means be averted.³⁵³

Oliver followed up the publication of his letter with assertive action. He sent copies of the published letter to the *Mining Journal* and to the *Hospital*.³⁵⁴ In the *Mining Journal* the editorials and correspondence, which ensued, focused c need for an enquiry in the Transvaal.³⁵⁵ Towards the end of June the public demands in Britain for an investigation and for the urgent introduction of preventive measures on the Witwatersrand gold mines intensified. One of the reasons for the sustained publicity was the circulation in Britain of the Transvaal Government Mining Engineer's report, which had been recently published.³⁵⁶

The Cornish newspapers made a major issue of Oliver's disclosures.³⁵⁷ Editors of newspapers, local authorities and health officers emphasised the need for an enquiry on the Witwatersrand. Oliver's observations of accelerated silicosis amongst miners in the north of England confirmed the findings of the Cornish doctors: the new disease amongst former Transvaal gold miners differed radically from the "old miners' complaint" in Cornwall, namely "tuberculous phthisis". The Redruth local authorities urged Caine, the MP for Camborne, to pursue the problem. Caine, in turn, required from the Medical Officers of Health for the Redruth Urban and District Councils definitive figures, which he could present to parliament. The problem of silicosis on the Rand affected Caine's constituents both in the Transvaal and in Cornwall.

The statistics compiled by Permewan and Hichens showed that from 1900 to 1901 at least one-third of the sixty-four and forty "male deaths from phthisis", which had occurred in the Redruth urban and rural districts, were "men who had returned from the Transvaal". Trestrail considered these figures to be merely "a flea-bite": he was sure that there was "a much higher percentage of deaths due to phthisis of those miners returned from South Africa".³⁵⁸ Even so, Caine viewed the health officers' statistics as being sufficiently serious for public disclosure. He wanted to ensure that the House of Commons exerted pressure on Chamberlain to institute an enquiry in the Transvaal and to implement remedial measures on the Witwatersrand gold mines.

The Redruth local authorities were optimistic that Captain Francis Oats, a prominent tin-mine owner, would publish the British mortality statistics in South Africa or use them to persuade the Randlords of the need for urgent preventive measures.³⁵⁹ Oliver's findings and their confirmation by Cornish health officers had perturbed Oats, a director of De Beers and a member of the Cape Legislative Assembly. Oats, who was visiting his native county, had made his own enquiries from Cornish doctors. He then forwarded to Charles Rube, one of the London directors of the Corner House, for communication to his board, a great deal of information about the manifestation of the disease in Cornwall together with many suggested

preventive measures.³⁶⁰ The hopes of the Cornish local authorities that Oats's influence would promote change on the Witwatersrand were partly fulfilled. It is possible that Oats's evidence persuaded the Chamber to hold the competition for the best appliance to lay dust.

But Oats did not convince the Chamber that an enquiry was necessary. Wernher, Beit and Company despatched Oats's documents to its Transvaal board who referred them to Sidney Jennings, the consulting engineer of the Rand Mines company. The response of Jennings to his board was polite but contained: management was alive to the problem; it had been instituting preventive measure for more than a year; and the only obstacle to full control of the problem were the rock drillers' "objections" to the precautions.³⁶¹ The Corner House directors were obviously satisfied with the confidence that Jennings showed. Neither the board nor Jennings viewed the problem as sufficiently serious to warrant an enquiry.

Caine thought otherwise. Between July and October 1902 in Britain the publicity concerning silicosis subsided. But in October 1902 the issue again became prominent in the British press. This was the direct result of Caine's disclosure to the House of Commons of the figures in Cornwall for the mortality amongst returned Witwatersrand miners.³⁶² Also, Caine asked questions about the working

conditions and methods of mining on the witwatersrand and about the death rate from silicosis in the Transvaal itself. To these pertinent issues Chamberlain on 22 and 29 October gave evasive and non-committal replies.³⁶³ In emphasising the relationship between the miners' "discontent", namely their opposition to supervising three drills, and their vulnerability to silicosis, Caine called attention in the House of Commons to Milner's refusal to "constitute a Board of Arbitration" in the Village Main Reef strike.³⁶⁴

On 29 October Chamberlain had only a single, feeble reply to all Caine's questions:

I propose to answer the four questions of the hon. Member together, as they are all connected with the same subject, and I need hardly say that I am fully alive to the importance of all matters affecting the health and safety of the miners. As I informed the hon. Member on the 21st instant, I am in communication with Lord Milner on the subject of the alleged prevalence of miners' phthisis, but at present, I possess neither statistics nor the other information for which the hon. Member has asked. I will, however, address further inquiries to Lord Milner on these matters.³⁶⁵

The reason that Chamberlain was obliged to give the House of Commons such an unsatisfactory answer was that Milner had not, in any way, directed the attention of the Colonial Secretary to the silicosis problem. Milner's sole intimation to the Colonial Office of the mortality amongst rock drillers was the brief reference to it in the report of the Government Mining Engineer. In June, without comment and as a

necessary formality, Milner had forwarded the report to the Colonial Office.³⁶⁶ Therefore by the end of October 1902 the report, which dealt with numerous mining matters, was Milner's only intimation to Chamberlain of the existence of the problem.

The Colonial Office was not entirely unaware of the problem. In August 1902 Trestrail forwarded for Chamberlain's personal attention his own correspondence with the *Mining Journal* in 1901. In a covering letter he also stressed the urgency for an enquiry and remedial intervention.³⁶⁷ The Colonial Office paid scant attention to Trestrail's warning. But shortly afterwards Chamberlain received a letter from James Brown, the Medical Officer of Health for Bacup, in which the doctor forcibly expressed his distress:

In my yearly visit to my native county of Cornwall I have been deeply impressed by the fearful death-rate which occurs amongst Cornish miners who have returned from Johannesburg - the deep levels of the South African gold mines. In my recent visit in the neighbourhood of Callington we calculated that there were almost 40 miners who have died, men who would be in their prime. As many as three in a family. The attraction of high wages captivates these men. I saw a person who has lost 3 brothers & yet another was going. From conversation with doctors in Cornwall I am convinced that the disease is due to the fine dust from the rock drills in the deep mines...the disease is not like the ordinary Cornish miners' lung disease, phthisis, that I used to see 27 years ago in Cornwall. It is far more rapid and fatal, far less amenable to treatment...Cornish doctors tell me that treatment is useless. I know of no trade as dangerous as that of the fast method of working the deep levels of the S. African gold mines. What I propose is that immediate steps be taken to ascertain

facts. The death-rate among the Cornish miners as far as I can get information is a scandal to our civilization.³⁶⁸

Brown's letter provoked interest amongst the members of the Colonial Office. The Duke of Marlborough established a connection between Brown's "theory" and that of Trestrail and suggested that Chamberlain make further enquiries.³⁶⁹ On 6 September Chamberlain enclosed the two letters in a despatch to Milner in which he asked the Governor of the Transvaal whether he had any observations to offer.³⁷⁰ A sense of curiosity rather than urgency prompted the Colonial Office's request to Milner.³⁷¹

Although Milner received this despatch,³⁷² it is missing from the Governor's 1902 file in the Transvaal Archives Depot.³⁷³ As we have seen, in 1912 neither the Department of Mines nor the Department of Interior could trace any confidential or official documents relating to the appointment of the Weldon Commission.³⁷⁴ Perhaps Milner placed the missing despatch and its contents, together with many subsequent letters from the Colonial Office, concerning silicosis, in a separate file, SF 34, which is lost.³⁷⁵

On 21 October Chamberlain answered Caine's first two parliamentary questions with self-assurance and confidence: he knew about the matter and was "in communication with the Governor on the subject".³⁷⁶ But a week later when the Colonial Office was apprised that Caine was relentlessly pursuing the matter with an additional four questions, its embarrassment, as we

have seen, was reflected in Chamberlain's reply. The Colonial Office had difficulty in framing a suitable answer, as H. B. Cox illustrated in a minute to G. V. Fiddes:

We have heard nothing from Ld. Milner on any of the points though we wrote as to phthisis on 6 Sept. & the S[ecretary] of S[tate] answered a question by Mr. Caine on it on 21/10.³⁷⁷

For special emphasis, Caine's fourth and last question, probed the need for an enquiry in the Transvaal:

To ask the Secretary of State for the Colonies, if it is the intention of the Governor of the Transvaal to appoint a Commission to inquire into Milner's phthisis; has such Commission been yet appointed; if so, what is its composition; will it contain representatives of the working miners; and will he state the substance of the references for its consideration.³⁷⁸

After he had read Caine's questions, Cox acknowledged:

The health question is a matter of importance, & under British Administration we may expect to hear a good deal about it.³⁷⁹

Milner, too, understood the implications of the debate in the House of Commons. Caine's questions compelled him to act decisively. The Governor of the Transvaal could no longer tinker with the commission. Within a week he gazetted the enquiry and announced most of the commissioners.³⁸⁰

Almost simultaneously - within six days of Milner's formal announcement - the British Home Office appointed a commission to investigate silicosis in

Cornwall.³⁸¹ At that time Dr John Scott Haldane and Joseph S. Martin, a senior inspector of mines, were investigating the epidemic in the Cornish tin mines of miners' anaemia, or ankylostomiasis.³⁸² By extending the enquiry's terms of reference concerning the ankylostomiasis enquiry, and by adding a third member to the enquiry, the manager of the Dolcoath Mine, R. Arthur Thomas, the British government established the silicosis commission under the chairmanship of Haldane.³⁸³ As William Dgle's mortality statistics for tin miners had twenty years earlier confirmed, an enquiry into silicosis in Cornwall was long overdue.³⁸⁴ Cornish doctors, who claimed correctly that conditions of mining on the Reef were far more detrimental to health than those in the tin mines, conceded that mine work in Cornwall "might be carried on under more advantageous circumstances".³⁸⁵ Even so, it was the mortality from silicosis amongst the Witwatersrand rock drillers that caused the British government to focus on mining conditions in Cornwall itself. For the first time since the investigations of the Kinnaird Commission in 1864, the Haldane Commission examined the effects of dust on the health of British hard rock miners.³⁸⁶

Miners in the Transvaal and the British public, particularly in Cornwall, welcomed the establishment of the Weldon Commission, "both in the interests of humanity as well as the industry itself".³⁸⁷ Its

appointment justified the belief that:

Now that South Africa is under British rule this matter, involving as it does serious loss of life, should be stringently dealt with.³⁸⁸

For various reasons, which we shall examine later, the recommendations of the Weldon Commission, although "prudential", begged the question of state legislation for dust controls.³⁸⁹ Even so, the conclusions of the Weldon Commission showed the commitment of the commissioners to reducing the incidence of and the mortality from the disease.³⁹⁰ But between 1903 and 1910 the successive governments of the Transvaal and the controllers of the gold mining industry paid mere lip-service to the "spirit" of the Weldon Commission's conclusions and recommendations. By 1912 it was claimed that the implementation of the Haldane Commission's recommendations had succeeded in reducing the "phthisis mortality" in Cornwall.³⁹¹ The position, however, was different on the Witwatersrand. In 1912 the Medical Commission, or the Van Niekerk Commission, showed that no "marked change" in the prevalence of silicosis had occurred since 1903.³⁹²

In 1911 Richard Barry confided to his uncle, John X. Merriman:

The terrible thing to think of is that it will take at least 7 years from the date upon which the whole community seriously starts trying to really achieve any noticeable results, since as things stand today, we are perpetually manufacturing fresh victims who will be with us for some such period as 7 years.³⁹³

Indeed, in 1911 the industry was "manufacturing" a minimum of "800 to 900 'new' cases" annually and, as had been the case in 1902, the prognosis for most rock drillers, was death within seven years.³⁹⁴ Proponents of the Weldon Commission had undoubtedly put far too much "trust" in the beneficence of British rule in the Transvaal.³⁹⁵

Notes

¹ *Lancet*, 4 June 1902, p. 1 678, letter by Sir T. Oliver.

² *Lancet*, 9 Aug. 1902, pp. 404-405, letter by Dr T. Marshall.

³ *Transvaal Government Gazette*, no. 579, 7 Nov. 1902.

⁴ See, for instance, UG 19, 1912, p. 5, par. 7; Irvine et al, p. 6; du Toit et al, p. 3; van Aswegen, p. 56.

⁵ Irvine et al, p. 6; *The Prevention of Silicosis on the Mines of the Witwatersrand*, 1937, p. 1.

⁶ Van Niekerk, p. 1.

⁷ Payne et al, p. 6; Irvine et al, p. 6; Cartwright, *Doctors of the Mines*, p. 136; Thorpe, p. 267; van Aswegen, p. 56. Van Aswegen uses the adverb "onmiddellik".

⁸ CAD, MNW, file MM 1505.712, F. S. Malan to Secretary of the Department of Mines, 18 May 1912, telegram.

⁹ *Union House of Assembly Debates*, W. Madeley, 21 May 1902, cols. 2810-2811.

¹⁰ CAD, MNW, file MM, 1505/1912, memorandum, 21 May 1912.

¹¹ CAD, MNW, file MM, 1505/1912, memorandum by R. Vaughan, 20 May 1912.

¹² Irvine et al, p. 7; Fraser and Irvine, p. 4.

¹³ Grey, p. 22.

¹⁴ Grey, p. 24.

¹⁵ Grey, p. 26.

¹⁶ Oliver, "Gold Miners' Phthisis and some of the Dangers to Health incidental to Gold Mining in the Transvaal", p. 1 678.

¹⁷ Grey, p. 26.

18 *Cornubian*, 7 Sept. 1899, "Notes and Comments", 16 Oct. 1901, "Cornish Miners and the Rand"; *Mining Journal*, 19 July 1902, p. 998, "Devon and Cornwall".

19 *Mining Journal*, 19 July 1902, p. 998, "Devon and Cornwall".

20 *Cornubian*, 20 Dec. 1901, letter by W. S. Caine, 10 April 1903, "Unique Cornwall"; *Mining Journal*, 19 July 1902, p. 998, "Devon and Cornwall"; *Cornishman*, 5 June 1902, "Mining Notes".

21 *Cornubian*, 20 Dec. 1901, letter by W. S. Caine.

22 *Cornubian*, 14 March 1902, "Good News for Cornish Miners".

23 PRO, CO, 680/1, despatches, Chamberlain to Milner, telegram no. 3, 28 April 1902, 291/39, despatches, Milner to Chamberlain, 1 May 1902; *Cornubian*, 9 May 1902, "Notes and Comments", 1 Aug. 1902, letter by E. P. Beer.

24 Grey, p. 29.

25 PRO, CO, 291/39, despatches, Milner to Chamberlain, 1 May 1902.

26 Headiam, v. 11, p. 294; O'Brien, pp. 185-189 passim.

27 See, for instance, PRO, CO, 291/34, despatches, Milner to Chamberlain, 23 Dec. 1901.

28 TAD, SNA, v. 22, 609/02, G. Turner to Lagden, 8 April 1902.

29 *Lancet*, 21 March 1908, p. 905, "House of Commons Notes"; *TNJ*, April 1908, p. 234, "News and Comments". Cf. Moroney, p. 3, who incorrectly refers to Sansom, whom he calls Samson, as an agent working for the WNLA.

30 Cd. 2183, 1904, p. 146.

31 PRO, CO, 291/40, despatches, Milner to Chamberlain, 11 July 1901, 27 Aug. 1901, 24 Oct. 1901, 291/41, despatches, Chamberlain to Milner, 28 Aug. 1901, telegram no. 2, 12 Oct. 1901, telegram no. 3.

32 Cf. Packard, p. 152. Packard does not realise that the Transvaal Medical Officer of Health and the medical "adviser" for the WNLA had the identical names: they were father and son. Consequently he incorrectly states that the positions were held by the same person.

33 PRO, CO, 291/57, despatches, Milner to Chamberlain, 23 May 1903, enclosure no. 2; TAD, SNA, v. 22, 609/02, G. Turner to Lagden, 8 April 1902,

W. Wybergh to G. Turner, 21 March 1902, 656/02, G. Turner to Lagden, 19 April 1902, Lagden to G. Turner, 19 April 1902.

34 TCMAR, 1900-1901, p. 41.

35 PRO, CO, 291/40, despatches, Milner to Chamberlain, 13 July 1901; TCMAR, 1900-1901, p. 63.

36 Lang, p. 125.

37 GHEAR...30 June 1905, p. 13.

38 TCMA, file W6(c), "Report of the Special Committee", [Oct.] 1902.

39 See above, chapter 7.

40 TCMA, file W6(c), "Report of the Special Committee", [Oct.] 1902.

41 TCMA, file W6(c), T. Leggett to Secretary of the TCM, 29 Aug. 1902.

42 Van der Horst, pp. 166-169; Levy, p. 152.

43 Denoon, "The Transvaal Labour Crisis, 1901-6", pp. 481-494 *passim*; Grey, p. 161; TG 2, 1908, p. 208, statement of J. B. Roberts.

44 PRO, CO, 291/57, despatches, Milner to Chamberlain, 23 May 1903.

45 *Report to the Commissioner for Native Affairs on the Mortality amongst Natives on the Mines of the Witwatersrand*, p. 4, "Table Shewing Causes of Death of Natives on Mines of the Witwatersrand".

46 PRO, CO, 291/57, despatches, Milner to Chamberlain, 23 May 1903.

47 PRO, CO, 291/69, despatches, Milner to Lyttelton, 21 March 1904; TCMA, file N8, A. Lawley to President of the TCM, 17 May 1904; Cd. 2183, 1904, pp. 144-145, Annexure J.

48 Cd. 2183, 1904, pp. 144-145, Annexure J; Irvine and Macaulay, p. 356.

49 Irvine and Macaulay, p. 357.

50 Irvine and Macaulay, p. 357.

51 Napier, p. 156.

52 *Report of the Transvaal Coloured Labour Commission*, 1905, p. 79, Appendix G.2.

53 *Report of the Transvaal Coloured Labour Commission*, 1905, p. 79, Appendix G.2.

54 PRO, CO, 291/57, despatches, Milner

to Chamberlain, 23 May 1903, enclosure no. 2.

55 PRO, CO, 291/72, parliament, minute by A. Lyttelton, 19 Nov. 1904.

56 PRO, CO, 291/72, despatches, Milner to Lyttelton, 12 Sept. 1904, enclosure, Dr C. L. Sansom to the Pass Commissioner, Native Affairs Department, 27 Aug. 1904, 291/115, parliament, minute by H. Lambert.

57 PRO, CO, 291/133, parliament, minute by H. Lambert, 18 Nov. 1908.

58 Cd. 2183, 1904, p. 45, Lord Milner to A. Lyttelton, (received 9 April 1904), no. 11.

59 Gorgas, pp. 6-19 passim.

60 *Lancet*, 28 March 1914, "Surgeon-General Gorgas and the Panama Canal".

61 Fraser and Jeeves, p. 119, L. Phillips to S. Evans, 17 April 1903.

62 TAD, SNA, v. 11, 2501/1, H. R. F. Bourne to Chamberlain, 22 Feb. 1901, v. 19, Chamberlain to Milner, 29 Nov. 1901.

63 See, for instance, Cd. 2183, 1904, p. 41, A. Lyttelton to Lord Milner, telegram, 22 Feb. 1904; and Cd. 2025, 1904, p. 42, Lord Milner to A. Lyttelton, telegram, 27 Feb. 1904.

64 PRO, CO, 291/68, despatches, Milner to Lyttelton, 27 Feb. 1904.

65 TCMA, file W6(c), F. H. P. Creswell to Secretary of the TCM, [Sept.] 1902. See also Katz, *A Trade Union Aristocracy*, pp. 78-84.

66 PRO, CO, 291/42, despatches, Milner to Chamberlain, 11 Sept. 1902, telegram; TCMA, file W6(c), T. Leggett to Secretary of the TCM, 26 Aug. 1902.

67 PRO, CO, 291/42, despatches, Milner to Chamberlain, 12, 15 Sept. 1902, telegrams. See also Creswell, pp. 124-136 passim.

68 Van der Horst, pp. 173-174.

69 PRO, CO, 291/42, despatches, Milner to Chamberlain, 12, 15 Sept. 1902, telegrams.

70 See, for instance, *Cornubian*, 18 Sept. 1902, letter by F. J. Tiddy.

71 *Cornubian*, 7 Sept. 1899, "Notes and Comments".

72 *Cornubian*, 9 Jan. 1904, letter by

T. Pengelly.

73 See for instance, Denoon, "The Transvaal Labour Crisis, 1901-6", pp. 481-494 *passim*; Wolpe, p. 429-430; and Legassick, pp. 260-261. Denoon argues that the Randlords in pursuit of profits dominated Milner. The radical historians, Wolpe and Legassick, support Denoon's argument, but from a different perspective.

74 See, for instance, Mawby, pp. 387-415 *passim*. He argues that Milner used the mining industry to achieve his political goals.

75 Jeeves, "The Administration and Control of Migratory Labour on the South African Gold Mines: Capitalism and the State in the Era of Kruger and Milner", p. 2. See also Yudelman, pp. 59-60, who implicitly uses this argument.

76 Milner Papers, FK 1209, 16 Nov. 1903, confidential report by Milner to the British Cabinet.

77 Jeeves, "The Administration and Control of Migratory Labour on the South African Gold Mines: Capitalism and the State in the Era of Kruger and Milner", p. 15.

78 TAD, SNA, v. 11, private, Milner to J. Rose Innes, 31 Oct. 1901; Jeeves, "The Administration and Control of Migratory Labour on the South African Gold Mines: Capitalism and the State in the Era of Kruger and Milner", pp. 7-8. See also Marks and Trapido, pp. 67-68.

79 Grey, p. 64.

80 Jeeves, *Migrant Labour in South Africa's Mining Economy*, pp. 48-49.

81 Chamberlain Papers, JC 13/1/128, Chamberlain to L. Mountbatten, 13 Dec. 1901. Markham was the MP for the constituency of Mansfield.

82 PRO, CO, 291/37, despatches, Milner to Chamberlain, 23 Dec. 1901, Milner to Chamberlain, 17 Jan. 1903, 291/50, individuals, E. P. Rathbone to Chamberlain, 13 March 1902.

83 PRO, CO, 291/38, despatches, Milner to Chamberlain, 8 March 1902, enclosure, 291/39, despatches, Milner to Chamberlain, 21 June 1902, enclosure.

84 See above, chapter 9.

85 PRO, CO, 291/72, Milner to Lyttelton, 20 June 1904, enclosure, H. W. Sampson to H. Weldon, 21 April 1904.

86 PRO, CO, 291/73, despatches, Milner to Lyttelton, 10 Oct. 1904, enclosure H. Weldon to

Secretary of the TCM, 3 Sept. 1903; Council minutes of the AMM, 2 March 1903.

87 PRO, CO, 291/58, despatches, Milner to Chamberlain, enclosure W. Mather to W. Wybergh, 25 Aug. 1902.

88 See, for instance, Council minutes of the AMM, 2 March 1903.

89 PRO, CO, 291/53, individuals, T. Ratcliffe to Chamberlain, 15 Oct. 1902. See also *ibid.*, 291/58, despatches, Milner to Chamberlain, 10 July 1903, enclosure; and *South African News*, 27 Feb. 1903, "Sunday Labour at the Rand".

90 See, for instance, PRO, CO, 291/58, despatches, Milner to Chamberlain, 10 July 1903, enclosure, "Copy C".

91 MacDonald, p. 105.

92 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association".

93 PRO, CO, 291/53, individuals, T. Ratcliffe to Chamberlain, 15 Oct. 1902, minute by F. Graham, 16 March 1902. See also *ibid.*, 291/42, Milner to Chamberlain, despatches, 29 Sept. 1902, 291/58, despatches, Milner to Chamberlain, 10 July 1903.

94 See, for instance, PRO, CO, 291/53, individuals, T. Ratcliffe to Chamberlain, 15 Oct. 1902, minute by F. Graham.

95 PRO, CO, 291/71, despatches, Milner to Lyttelton, 20 June 1904, enclosure, H. W. Sampson to H. Weldon, 11 April 1904, 291/73, despatches, Milner to Lyttelton, 10 Oct. 1904; *African Review*, 25 Oct. 1902, p. 118, "Interview with the Miners' Association".

96 PRO, CO, 291/84, despatches, Selborne to Lyttelton, 24 July 1905.

97 Council minutes of the AMM, 20 April 1903.

98 *Report of a Commission...Mining by Single Outlet*, 1907, p. xi, par. 8.

99 *Report of a Commission...Mining by Single Outlet*, 1907, p. 106, evidence of H. Weldon. Note, in particular, the statement and evidence of H. Weldon, *ibid.*, pp. 106-113.

100 TCMA, file W6(c), T. Leggett to Secretary of the TCM, 29 Aug. 1902.

101 JCMNS, July 1905, p. 5, "Inaugural Address".

102 Bozzoli, *The Political Nature of a Ruling*

Class, p. 9.

103 Jeeves, "The Administration and Control of Migratory Labour on the South African Gold Mines: Capitalism and the State in the Era of Kruger and Milner", p. 11.

104 Katzen, p. 49, Table 9.

105 *SAMR*, Dec. 1904, p. 233, "Johannesburg Jottings".

106 See, for instance, *MJSA*, Dec. 1917, p. 86, "Obituary"; and PRO, CO, 291/45, despatches, Chamberlain to Milner, 19 Dec. 1901.

107 *BMJ*, 3 June 1905, p. 1 232, "Medical Practice in South Africa".

108 *SAMR*, 11 Aug. 1917, p. 237, "Passing Events".

109 *Lancet*, 4 June 1904, pp. 1 610-1 611, "The Present State of Medical Practice in South Africa: A Warning". See also *BMJ*, 3 June 1905, p. 1 232, "Medical Practice in South Africa".

110 Native Grievances Commission, transcript of evidence, 2 Feb. 1914, p. 60, evidence of S. A. M. Pritchard.

111 TAD, GOV, 984, 33/11/1906, W. G. Grant to D. Majoribanks, 8 March 1906; Native Grievances Commission, transcript of evidence, 2 Feb. 1914, p. 17, evidence of S. A. M. Pritchard.

112 *TMJ*, Feb. 1906, p. 207, "The New Mine Medical Service".

113 TAD, SNA, v. 22, 609/02, W. Wybergh to G. Turner, 21 March 1902.

114 *TMJ*, Feb. 1906, p. 207, "The New Mine Medical Service".

115 See, for instance, Franks, p. 111; and *TMJ*, May 1908, pp. 248-249, "Presidential Address - British Medical Association, Transvaal Branch, 1908", Aug. 1911, p. 15, "News and Comments".

116 *SAMR*, Dec. 1904, p. 233, "Johannesburg Jottings".

117 *TMJ*, 1 Sept. 1905, p. 27, "The Moir Case". See also Council minutes of the AMM, 4 Jan. 1906, 4 June 1906.

118 Council minutes of the AMM, 4 Jan. 1906.

119 Council minutes of the AMM, 16 Jan. 1906.

120 TAD, GOV, 984, 33/11/1906, W. G. Grant to

D. Majoribanks, 8 March 1906.

121 Merriman Papers, correspondence, J. S. Marwick to JXM, 26 Feb. 1912.

122 TCMA, file N7, Assistant Secretary for Native Affairs to Secretary of the TCM, 2 Feb. 1906.

123 Merriman Papers, correspondence, J. S. Marwick to JXM, 26 Feb. 1912.

124 SAMR, 26 Aug. 1916, p. 243, "The Miners' Phthisis Medical Bureau".

125 TAD, SNA, v. 22, 609/02, W. Wybergh to G. Turner, 21 March 1902.

126 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 29, qq. 99-100, evidence of Dr J. L. Aymard; SAMR, 12 July 1912, "Medical Matters in Parliament.

127 Native Grievances Commission, transcript of evidence, 2 Feb. 1914, pp. 16-23 passim, evidence of S. A. M. Pritchard; CAD, MNW, file MM 1106/10, Assistant Secretary of Mines to Deputy Inspector of Mines, Krugersdorp, [April] 1910.

128 CAD, MNW, file MM 1106/10, Assistant Secretary of Mines to Deputy Inspector of Mines, Krugersdorp, [April] 1910.

129 Jeeves, "The Administration and Control of Migratory Labour on the South African Gold Mines: Capitalism and the State in the Era of Kruger and Milner", p. 4.

130 TCMA, file NB, Lawley to President of the TCM, 17 May 1904.

131 TCMA, file N9, "Notes of a Meeting held in Pretoria", 8 July 1904".

132 TCMA, file N9, "Notes of a Meeting held in Pretoria", 8 July 1904".

133 TCMA, file NB, G. A. Denny to President of the TCM, 26 May 1904.

134 TCMA, file NB, G. A. Denny to President of the TCM, 26 May 1904.

135 TCMA, file N9, "Notes of a Meeting held in Pretoria", 8 July 1904".

136 TCMA, file NB, "Report of the Committee of the Transvaal Medical Society...".

137 TCMA, file NB, G. A. Denny to President of the TCM, 26 May 1904.

138 TCMA, file N9, G. A. Turner to Milner, 12

July 1904.

139 Gorgas, pp. 9-11.

140 *Report of the Coloured Labour Compound Commission*, 1905, pp. 1-93 passim.

141 PRO, CO, 291/80, despatches, Milner to Lyttelton, 6 Feb. 1905, minute by H. Lambert, 2 March 1905.

142 TCMA, file N9, Secretary of the WNLA to Secretary of the TCM, 12 Aug. 1904,

143 PRO, CO, 291/80, despatches, Milner to Lyttelton, 6 Feb. 1905, minute by H. Lambert, 2 March 1905.

144 PRO, CO, 291/80, despatches, Milner to Lyttelton, 6 Feb. 1905, minute by the Duke of Marlborough, 2 March 1905.

145 TCMA, file N9, "Notes of a Meeting held in Pretoria", 8 July 1904.

146 *South African Mines, Commerce and Industries*, 2 June 1906, p. 253, "Leading Article".

147 JCMNS, Dec. 1906, "Witwatersrand Mine Air: Recent Investigations", p. 181, discussant D. W. Bradford.

148 JCMNS, Oct. 1906, "Safety Measures in Mining", p. 114, discussant J. Yates, Dec. 1906, "Witwatersrand Mine Air: Recent Investigations", p. 181, discussant D. W. Bradford.

149 *Reynolds Newspaper*, 10 Aug. 1913, "Rand Investor's Protest".

150 Merriman Papers, correspondence, F. D. P. Chaplin to JXM, 18 Jan. 1914.

151 *TMJ*, June 1913, p. 267, "Medical Care of Native Mine Employees". See also *Union House of Assembly Debates*, J. W. Sauer, 10 June 1913, col. 3304.

152 Merriman Papers, correspondence, R. Barry to JXM, 24 May 1914.

153 See above, chapter 6.

154 *SAMR*, 22 July 1911, p. 203, "British Medical Association".

155 *UG* 34, 1914, p. 258.

156 *Union House of Assembly Debates*, H. Mentz, 13 May 1913, col. 2373.

157 *SC* 2, 1913 passim.

158 CAD, MNW, file MM 1106/10, Assistant Secretary of Mines to Deputy Inspector of Mines, Krugersdorp, [April] 1910. See also *Evening Chronicle*, 11 May 1914, "Evening Comment".

159 TCMA, file W6(c), T. Leggett to Secretary of the TCM, 29 Aug. 1902.

160 *Report of the Council of the Association of Mine Managers*, 1902, p. 5.

161 For details of the strike, see Katz, *A Trade Union Aristocracy*, pp. 47-52.

162 Cf. Thorpe, p. 136, who, following Cope, p. 65, incorrectly notes the involvement of miners in the strike.

163 *Star Weekly Edition*, 19 July 1902, "Miners' Union".

164 *Star Weekly Edition*, 2 Aug. 1902, "Miners' Association".

165 Gitsham and Trembath, p. 66.

166 *Star Weekly Edition*, 2 Aug. 1902, "Miners' Association".

167 TG 2, 1908, p. 427, qq. 4 538-4 540, evidence of T. Mathews. See also Katz, *A Trade Union Aristocracy*, pp. 55-56.

168 *Rand Daily Mail*, 21 Nov. 1910, "Mine Workers' Federation".

169 PRO, CO, 291/42, despatches, Milner to Chamberlain, 15 Sept. 1902.

170 *Cornubian*, 21 Nov. 1902, "Notes and Comments".

171 *Cornubian*, 21 Nov. 1902, "Notes and Comments".

172 PRO, CO, 291/42, despatches, Milner to Chamberlain, 15 Sept. 1902.

173 *Cornubian*, 21 Nov. 1902, "Notes and Comments".

174 *Cornubian*, 20 Feb. 1904, "Life in Johannesburg".

175 *Star Weekly Edition*, 2 Aug. 1902, "Miners' Association".

176 *Star*, 25 Feb. 1902, letter by "Underground Workman"; *Report of the Council of the Association of Mine Managers*, 1902, p. 5.

177 *Star*, 25 Feb. 1902, letter by "Underground Workman"; *Star Weekly Edition*, 2 Aug. 1902, "Miners' Association".

178 *Star Weekly Edition*, 19 July, 1902, "Miners' Association", 2 Aug. 1902, "Miners' Association".

179 Most historians, including myself, who have previously investigated the establishment of the Transvaal Miners Association, have not established the link between the miners' need for unionisation and the prevalence of silicosis. See Gitsham and Trembath, p. 65; Ticktin, p. 113; Grobler, p. 40; and Katz, *A Trade Union Aristocracy*, p. 54.

180 Gitsham and Trembath, p. 66.

181 *Star Weekly Edition*, 17 July, 1902, "Miners' Association".

182 *Star Weekly Edition*, 2 Aug. 1902, "Miners' Association".

183 *Transvaal Leader*, 28 Aug. 1909, "Capital and Labour".

184 See above, chapter 8.

185 Council minutes of the AMM, 5 Aug. 1901; Monthly minutes of the AMM, 19 Aug. 1901.

186 SC 10, 1913, p. viii, Appendix C.

187 SC 10, 1912, pp. 147-148, q. 1 116, evidence of R. Barry.

188 *Centurion*, article 2.

189 *Report of the Miners' Phthisis Commission, 1902-1903*, pp. 24, 26, qq. 131, 161, evidence of Dr W. B. Rogers.

190 *GMEAR*...31 Dec. 1902, pp. 10-11.

191 PRO, CO, 291/60, despatches, Milner to Chamberlain, 18 Dec. 1903.

192 PRO, CO, 291/33, institutions, Colonial Office to Home Office, 4 July 1902; *Star*, 2 June 1902, "Report of the Government Mining Engineer".

193 *GMEAR*...31 Dec. 1901, pp. 10-11.

194 *GMEAR*...31 Dec. 1901, p. 11.

195 *Transvaal Leader*, 28 Aug. 1909, "Capital and Labour".

196 *GMEAR*...30 June 1902, p. 8.

197 TG 2, 1908, p. 679, statement of R. J. Gluyas.

198 See, for instance, *Report of the Miners' Phthisis Commission, 1902-1903*, p. xx, par. 25; *GHEAR...* 30 June 1902, p. 8; Fraser and Irvine, p. 7; and Irvine et al, p. 6.

199 *Cd.* 2091, 1904, p. 18.

200 *GHEAR...* 31 Dec. 1901, p. 11.

201 *GHEAR...* 31 Dec. 1901, p. 11.

202 *TCNAR*, 1900-1902, passim.

203 *JCHMS*, July 1905, p. 7, "Presidential Address".

204 *JCHMS*, Aug. 1906, "Safety Measures in Mining", p. 36, discussant J. Yates.

205 *JCHMS*, April 1903, "Miner's [sic] Phthisis: Some Notes and Suggestions, p. 245, discussant T. L. Carter; *Star*, 12 Nov. 1902, "Miners' Phthisis".

206 *JCHMS*, Aug. 1906, "Safety Measures in Mining", p. 44, discussant C. B. Saner. See also *Cornubian*, 18 Sept. 1902, letter by F. J. Tiddy, 24 April 1903, "Mining and Consumption".

207 *The Times*, 13 Oct. 1902, letter by F. Fox. See also *Cornubian*, 24 April 1903, "Mining and Consumption".

208 *Mining Journal*, 5 July 1902, p. 935, "Consumption Among Miners on the Rand".

209 Irvine, p. 221. See also *Cornubian*, 18 Sept. 1902, letter by F. J. Tiddy, 22 May 1903, "Notes and Comments", 6 June 1903, "Notes and Comments".

210 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 12, q. 9, evidence of Dr L. B. Irvine.

211 *Pern*, p. 874.

212 *Cornubian*, 6 June 1903, "Notes and Comments".

213 See, for instance, *Cornubian*, 2 Nov. 1902, "Deaths of Cornishmen in the Transvaal".

214 Fitzgerald Papers, pp. 1-2; Cockerill Letters, John Cockerill to his mother, 5 Oct. 1904.

215 See, for instance, *Star*, June 1901-June 1906; *Rand Daily Mail*, June 1902-June 1906.

216 See, for instance, *Cornubian*, 21 Feb. 1902, "Camborne".

217 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 112, qq. 965-966, evidence of

T. Pearson.

218 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 26, q. 173, evidence of Dr W. G. Rogers.

219 *Cornubian*, 24 April 1903, "Notes and Comments".

220 Council minutes of the AMM, 2 Sept. 4 Nov. 1901; Monthly minutes of the AMM, 21 Oct. 1901.

221 Monthly minutes of the AMM, 5 Aug. 19 Aug. 1901.

222 UG 19, 1910, pp. 8, 10, pars. 10, 13.

223 See, for instance, PRO, CD, 291/77, individuals, Secretary of the TCM, London, to Lyttelton, 31 May 1904.

224 *Report of the Council of the Association of Mine Managers, 1902*, p. 13; Council minutes of the AMM, 3 March 1902.

225 Council minutes of the AMM, 3 March 1902.

226 See, for instance, BRA, HE, v. 258, file 154M, S. Jennings to H. Eckstein and Company, 21 Aug. 1902.

227 Council minutes of the AMM, 3 March 1902.

228 Monthly minutes of the AMM, 5 Aug., 19 Aug. 1901; Council minutes of the AMM, 3 March 1902.

229 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 1, q. 3, evidence of Dr F. Napier.

230 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 1, q. 3, evidence of Dr F. Napier.

231 BRA, HE, v. 258, file 154M, S. Jennings to H. Eckstein and Company, 21 Aug. 1902. Cf. Grey, p. 301, who suggests that management unquestioningly accepted the medical view that dust was the primary cause of silicosis.

232 BRA, HE, v. 258, file 154M, S. Jennings to H. Eckstein and Company, 21 Aug. 1902. See also *Report of the Miners' Phthisis Commission, 1902-1903*, pp. 4-5, q. 3, evidence of Dr F. Napier.

233 Council minutes of the AMM, 1 Sept. 1902.

234 JCNMS, Oct. 1903, "Some Mine Gases", p. 67, discussant Dr D. Macaulay.

235 Cullen, p. 217.

236 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 122, q. 1 164, evidence of E. Lewis.

237 *Star*, 19 Feb. 1902, "Annual Meeting of Mine Managers' Association".

238 *Star*, 25 Feb. 1902, letter by "Underground Workman".

239 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 26, q. 170, evidence of Dr W. D. Frazer. See also *ibid.*, p. 13, q. 9, evidence of Dr L. G. Irvine.

240 *Star*, 12 Nov. 1902, "Miners' Phthisis".

241 See *Star*, April 1901-June 1902 *passim*; *Rand Daily Mail*, Jan. 1902-June 1902 *passim*; *SAHR*, 1902, *passim*; *Lancet*, Jan. 1900-June 1902 *passim*; and *BMJ*, Jan. 1900-June 1902. The *TMJ* began publication only in August 1903.

242 *GMEAR...31 December, 1901*, p. 1; *Report of the Miners' Phthisis Commission, 1902-1903*, p. 22, q. 97, evidence of Dr D. Macaulay; *Mining Journal*, 5 July 1902, p. 935, "Consumption Among Miners on Rand". Cf. Grey, p. 300, who incorrectly attributes the high death rate overseas to the dampness of the European climate.

243 See, for instance, *Report of the Miners' Phthisis Commission, 1902-1903*, p. 22, q. 97, evidence of Dr D. Macaulay.

244 *Star Weekly Edition*, 6 Sept. 1902, "Notes and Comments".

245 *Star Weekly Edition*, 6 Sept. 1902, "Notes and Comments"; *GMEAR...31 December, 1901*, p. 1.

246 Nesbitt, p. 71.

247. See above, chapter 8.

248 A. H. Marais, p. 70, JXM to M. T. Steyn, 12 May 1912.

249 *JCHMS*, Oct. 1906, "Safety Measures in Mining", p. 114, discussant M. H. Coombe.

250 Oliver "Gold Miner's [sic] Phthisis", p. 762.

251 Oliver, *Diseases of Occupation*, pp. 280-281.

252 Oliver, "An Address on Rand Miners' Phthisis...", p. 920.

253 Pern, p. 874.

254 Pern, p. 874.

255 Pern, p. 875.

- 256 UG 19, 1912, p. 20, par. 53.
- 257 UG 19, 1912, p. 12, par. 53.
- 258 *Star*, 3 Dec. 1902, letter by anonymous miner, "A. P.". See also TAD, MM, 1395/06, 22 May 1906, "Deputation from Transvaal Miners' Association".
- 259 JCHMS, Oct. 1906, "Safety Measures in Mining", p. 114, discussant M. H. Coombe.
- 260 JCHMS, Oct. 1906, "Safety Measures in Mining", p. 114, discussant M. H. Coombe.
- 261 Nesbitt, p. 32.
- 262 *Centurion*, article 1.
- 263 *Reynolds Newspaper*, 8 Aug. 1913, "City of Dreadful Death".
- 264 *Rand Daily Mail*, 6 Oct. 1902, "Miners' Mass Meeting".
- 265 *West Briton*, 4 July 1907, "The Other Side"; *Reynolds Newspaper*, 8 Aug. 1913, "City of Dreadful Death".
- 266 *Labour Leader*, 7 Aug. 1913, "Parliament Day by Day".
- 267 *West Briton*, 4 July 1907, "the Other Side".
- 268 *Final Report of the Mining Regulations Commission*, 1910, v. 1, p. 14, par. 4.
- 269 See above, chapter 2.
- 270 Heymann, p. 11.
- 271 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 240, evidence of Dr L. G. Irvine.
- 272 *Transvaal Leader*, 27 Aug. 1910; letter by E. J. Moynihan.
- 273 Anon., "The Gloom of the Mines", p. 432.
- 274 See, for instance, TG 2, 1908, p. 108, qq. 760-761, evidence of L. J. Reyersbach; and *Evening Chronicle*, 5 May 1913, "Mining Disabilities".
- 275 Merriman Papers, correspondence, Sir W. B. Berry to JXM, 1 Sept. 1913.
- 276 TG 2, 1908, pp. 313, 319, 324, 341, 343, 516, 665, 690, 711, qq. 2 935, 3 024, 3 096-3 097, 3 319, 3 361-3 362, 6 034-6 036, 8 425, 8 428, 8 884-8 845, 10 101-10 102, evidence of S. S. Crowle, C. C. Smith, E. Moore, S. Richards, F. Crean

and W. H. Andrews.

277 Unless otherwise noted, the reasons for the strike and the details concerning it, are based on Katz, *A Trade Union Aristocracy*, pp. 78-82.

278 *Star Weekly Edition*, 9 Aug. 1902, "Unskilled White Labour Experiments".

279 TG 2, 1908, p. 442, q. 4 815, evidence of T. Mathews.

280 *Star*, 4 Oct. 1902, "The Village Labour Dispute".

281 *Star Weekly Edition*, 9 Aug. 1902, "Unskilled White Labour Experiments"; *African Review*, 25 Oct. 1902, p. 118, "The Miners' Association". See also *Final Report of the Mining Regulations Commission*, 1910, v. 2, pp. 14, 236, evidence of T. Mathews and M. Trewick and of Dr L. G. Irvine.

282 Katz, *A Trade Union Aristocracy*, pp. 79-80; Yudelman, p. 64. Cf. Thorpe, p. 145, who incorrectly states that the strike on the Village Main Reef did not reflect the overseas miners' opposition to the white labour policy.

283 Ticktin, p. 204.

284 See above, chapter 7.

285 For details of the miners' opposition to the "White Labour Policy", see Katz, *A Trade Union Aristocracy*, pp. 143-152 passim.

286 *Star*, 4 Oct. 1902, "The Labour Dispute".

287 TCMA, file W6(c), F. H. P. Creswell to Secretary of the TCM, [Sept.] 1902.

288 *Star*, 4 Oct. 1902, "Village Main Reef Strike".

289 *Star*, 4 Oct. 1902, editorial.

290 *British House of Commons Debates*, W. S. Caine, 29 Oct. 1902, cols. 1068-1070; *Newcastle Daily Chronicle*, 30 Oct. 1902, "Rock Drills and Miners' Phthisis".

291 *Star*, 4 Oct. 1902, editorial.

292 *Star*, 4 Oct. 1902, "Village Main Reef Strike"; *Newcastle Daily Chronicle*, 30 Oct. 1902, "Rock Drills and Miners' Phthisis".

293 *Final Report of the Mining Regulations Commission*, 1910, v. 1. p. 237.

294 Heymann, p. 11.

295 PRO, CO, 291/43, despatches, Milner to Chamberlain, 27 Oct. 1902.

296 *Star*, 4 Oct. 1902, editorial.

297 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 2, q. 3, evidence of Dr F. Napier; Council minutes of the AMM, 1 Sept. 1902-27 Oct. 1902; *Star*, 16 Dec. 1902, letter by J. L. Aymard.

298 *Transvaal Government Gazette*, no. 579, 7 Nov. 1902. See also *Report of the Miners' Phthisis Commission, 1902-1903*, p. v, par. 2; and *Star*, 8 Nov. 1902, "Miners' Phthisis".

299 *Star*, 16 Dec. 1902, letter by J. L. Aymard.

300 SC 10, 1912, p. 214, q. 1 515, evidence of W. J. Wybergh; *Star*, 16 Dec. 1902, letter by J. L. Aymard.

301 Chamberlain Papers, 13/1/1-28, memorandum by L. Mountbatten.

302 *Star*, 2 June 1902, "Report of the Government Mining Engineer".

303 *Star*, 2 June-2 July 1902 passim; *South African Mines, Commerce and Industries* June-July 1902 passim.

304 *Star*, 16 Dec. 1902, letter by J. L. Aymard.

305 *Star*, 16 Dec. 1902, letter by J. L. Aymard.

306 *Star*, 12 Nov. 1902, "Miners' Phthisis".

307 *Star*, 12 Nov. 1902, "Miners' Phthisis".

308 *Star*, 12 Nov. 1902, "Miners' Phthisis"; JCMMS, March 1902, "Miner's [sic] Phthisis: Some Notes and Suggestions", pp. 226 ff., discussing Dr J. L. Aymard.

309 *Lancet*, 9 Aug. 1902, pp. 404-405, letter by Dr T. Marshall.

310 *TMJ*, 1 Dec. 1905, "News and Comments"; *Rand Daily Mail*, 23 Jan. 1911, "C., M. & M. Society".

311 TCMA, file M26, "Notes on Dr Aymard's Dust Arrestor"; *Transvaal Leader*, 30 Aug. 1910, "Miners' Phthisis".

312 See, for instance, *Lancet*, 2 Dec. 1911, pp. 1 588-1 589, letter by Dr J. L. Aymard; and *Mining Journal*, 17 Feb. 1912, p. 160, "Miners' Phthisis: the Penalty of Neglect".

313 *British House of Commons Debates*, J. Chamberlain, 29 Oct. 1902, col. 1070.

314 Calculations based on *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 241, "Table A", evidence of Dr L. G. Irvine.

315 Unless otherwise noted the following information on the epidemic of plague derives from Cd. 2104, 1904, pp. 84-87, "Public Health Department Report".

316 Merriman Papers, R. Barry to JXM, 22 Feb. 1914.

317 PRO, CO, 291/69, despatches, Milner to Lyttelton, 20 March 1904, telegram no. 1; *Rand Plague Committee: Report upon the Outbreak of Plague on the Witwatersrand March 18th to July 31st, 1904*, p. vi, 73.

318 TCMAR, 1904, p. xxx; *Rand Plague Committee: Report upon the Outbreak of Plague on the Witwatersrand March 18th to July 31st, 1904*, p. vi.

319 PRO, CO, 291/69, despatches, Milner to Lyttelton, 23 March 1904, telegram, minute by A. Lyttelton, 25 March 1904.

320 TMJ, Aug. 1905-Dec. 1914 passim; SAMR, Jan. 1905-Dec. 1914 passim.

321 SAMR, Sept. 1905, pp. 191, 195, "Johannesburg Notes", Johannesburg Jottings", Oct. 1905, p. 212, "Johannesburg Notes"; TMJ, pp. 170-171, "Report of the M.O.H. for Johannesburg".

322 See above, chapter 2. From 1902 to 1914 the agendas of the South African Medical Congresses did not include a single paper on industrial health or occupational medicine. See SAMR, 1902-1914 passim; and TMJ, 1905-1914 passim.

323 In his private correspondence Milner did not mention silicosis. See Milner Papers, FK 1090-1220, 1901-1904 passim.

324 Kubicek, "Finance Capital and South African Goldmining 1886-1914", pp. 386-387.

325 See, for instance, *Evening Chronicle*, 1 Aug. 1913, "Opinion in England".

326 Star, 1 Sept. 1902, letter by G. E. Webber.

327 Star, 13 Oct. 1902, "Miners' Phthisis"; TAD, 60V, v. 29, 998/02, Chamberlain to Milner, 1 Nov. 1902, enclosure, F. Fox to Chamberlain, 23 Oct. 1902.

328 TCMAR, 1904, p. 118.

329 Star, 1 Nov. 1902, "Transvaal Chamber of Mines"; TCMAR, 1902, pp. xxii, 182.

330 PRO, CO, 291/77, individuals, Secretary of

the TCM, London, to Lyttelton, 31 May 1904; *Star*, 1 Nov. 1902, "Transvaal Chamber of Mines"; *TCMAR*, 1902, p. 182.

331 *Cornubian*, 24 April 1903, "Mining and Consumption".

332 *Star*, 17 Oct. 1902, "Miner's Phthisis". Cf. Grey, p. 301, who claims this was the Chamber's intention.

333 *Star Weekly Edition*, 6 Sept. 1902, "Notes and Comments". See also BRA, HE, v. 258, file 154M, S. Jennings to H. Eckstein and Company, 21 Aug. 1902.

334 BRA, HE, v. 258, file 154M, S. Jennings to H. Eckstein and Company, 21 Aug. 1902; *JCMMS*, Oct. 1906, "Safety Measures in Mining", p. 113, discussant M. H. Coombe.

335 See, for instance, *JCMMS*, April 1903, "Miner's [sic] Phthisis: Some Notes and Suggestions", pp. 248, 255, 263-264, discussants T. L. Carter, Dr J. Moir and J. Yates, July 1905, p. 7, "Presidential Address"; Macaulay and Irvine, p. 300; *South African Mines, Commerce and Industries*, 1 Aug. 1903, p. 449, "Leading Article".

336 *GHEAR*...31 December 1901, p. 11.

337 See, for instance, *JCMMS*, April 1903, "Miner's [sic] Phthisis: Some Notes and Suggestions", pp. 248, 263-264, discussants T. L. Carter and J. Yates, July 1905, p. 7, "Presidential Address"; Macaulay and Irvine, p. 300.

338 *JCMMS*, April 1903, "Miner's [sic] Phthisis: Some Notes and Suggestions", p. 248, discussant T. L. Carter.

339 This was a reference to A. B. Markham.

340 *South African Mines, Commerce and Industries*, 1 Aug. 1903, p. 449, "Leading Article".

341 *TMJ*, Feb. 1906, "Health Regulations for Mines".

342 *Transvaal Government Gazette*, no. 579, 7 Nov. 1902.

343 *Mining Journal*, 23 Nov. 1901, p. 1 468, letter by N. Trestrail.

344 *Mining Journal*, 23 Nov. 1901, p. 1 468, letter by N. Trestrail.

345 *Cornubian*, 20 March 1903, "To the Members of the Redruth Rural District Council".

346 *Cornubian*, 21 Oct. 1902, "Redruth Urban District Council".

347 *Mining Journal*, 21 June 1902, p. 873, "Gold Miners' Phthisis".

348 See, for instance, *Transvaal Leader*, 9 Aug. 1910, "Miners' Phthisis", quoting E. J. Moynihan. In 1913 many local and British newspapers quoted Moynihan.

349 BRA, HE, v. 258, file 154M, F. Oats to C. E. Rube, 10 July 1902, enclosed clipping, [July].

350 Some historians, for instance, Thorpe, pp. 269-270, attribute the analogy to Ambrose Pratt, pp. 159, 165, who was, in fact, quoting Moynihan. Moynihan, in turn, was repeating Oliver's analogy.

351 Oliver, "Gold Miners' Phthisis and some of the Dangers to Health incidental to Gold Mining in the Transvaal", p. 1 677.

352 Oliver, "Gold Miners' Phthisis and some of the Dangers to Health incidental to Gold Mining in the Transvaal", p. 1 677-1 679, *passim*.

353 Oliver, "Gold Miners' Phthisis and some of the Dangers to Health incidental to Gold Mining in the Transvaal", p. 1 677.

354 *Cornubian*, 4 July 1902, "Mining"; BRA, HE, v. 258, file 154M, F. Oats to C. E. Rube, 10 July 1902, enclosed clipping, [July].

355 See for instance, *Mining Journal*, 5 July 1902, p. 935, "Consumption among Rand Miners", 12 July 1902, p. 967, letter by F. Robinson.

356 *Mining Journal*, 5 July 1902, p. 935, "Consumption among Rand Miners".

357 Unless otherwise noted the information concerning Cornwall is based on the following: *Cornubian*, 4 July 1902, "Mining", 7 Aug. 1902, "Mining Notes", 21 Aug. 1902, "Redruth Urban District Council", 12 Dec. 1902, "Redruth Urban District Council", 20 March 1903, "To the Members of the Redruth Rural District Council"; and BRA, HE, v. 258, file 154M, F. Oats to C. E. Rube, 10 July 1902, enclosed clipping, [July], R. G. Nesbitt to F. Oats, 15 July 1902, F. Hiehens [sic] [Hichens] and A. E. Pennewan [sic] [Permewan] to F. Oats, 21 July 1902, C. S. Jago to F. Oats, 22 July 1902.

358 *Cornubian*, 21 Aug. 1902, "Redruth Urban District Council". See also *ibid.*, 12 Dec. 1902, "Redruth Urban District Council".

359 *Cornubian*, 21 Aug. 1902, "Redruth Urban District Council", 20 March 1903, "To the Members of the Redruth Rural District Council".

360 BRA, HE, F. Oats to C. E. Rube, 11 July

1902.

361 BRA, HE, v. 258, file 154M, S. J. Jennings to H. Eckstein and Company, 21 Aug. 1902.

362 *British House of Commons Debates*, W. S. Caine, 21 Oct. 1902, cols. 352-353; *Newcastle Daily Chronicle*, 30 Oct. 1902, "Rock Drills and Miners' Phthisis".

363 *British House of Commons Debates*, W. S. Caine, 21 Oct. 1902, cols. 352-353, 29 Oct. 1902, cols. 1068-1070; *Star*, 23 Oct. 1902, "Miners' Phthisis"; *Newcastle Daily Chronicle*, 30 Oct. 1902, "Rock Drills and Miners' Phthisis".

364 *British House of Commons Debates*, W. S. Caine, 29 Oct. 1902, col. 1069.

365 *British House of Commons Debates*, W. S. Caine, 29 Oct. 1902, col. 1070.

366 PRO, CO, 291/41, despatches, Milner to Chamberlain, 4 July 1902.

367 PRO, CO, 291/51, individuals, N. Trestail to Chamberlain, 1 Aug. 1902.

368 PRO, CO, 291/52, individuals, J. Brown to Chamberlain, 29 Aug. 1902.

369 PRO, CO, 291/52, individuals, J. Brown to Chamberlain, 29 Aug. 1902, minute by the Duke of Marlborough, 2 Sept. 1902.

370 PRO, CO, 291/41, Chamberlain to Milner, 6 Sept. 1902.

371 See the wording of the minute by the Duke of Marlborough, 2 Sept. 1902, in PRO, CO, 291/52, individuals, J. Brown to Chamberlain, 29 Aug. 1902.

372 PRO, CO, 291/43, despatches, Milner to Chamberlain, 27 Oct. 1902. For the original despatch, see TAD, GOV, 569/02, Milner to Chamberlain, 27 Oct. 1902.

373 TAD, GOV, v. 21, 22, 23.

374 CAD, MNW, file MM, 1505/1912, memorandum, 21 May 1912, and memorandum by R. Vaughan, 20 May 1912.

375 See, for instance, TAD, CS, v. 162, 13843/02, 13903/02. Some, but not all, correspondence, which Chamberlain forwarded to Milner, is filed with the Governor's papers in the Transvaal Archives Depot.

376 *British House of Commons Debates*, W. S. Caine, 21 Oct. 1902, col. 353.

377 PRO, CO, 291/46, parliament, minutes by H. B. Cox and J. E. B. Seely, 28 Oct. 1902.

378 *British House of Commons Debates*, W. S. Caine, 29 Oct. 1902, col. 1069.

379 PRO, CO, 291/46, parliament, minute by H. B. Cox, 28 Oct. 1902.

380 *Transvaal Government Gazette*, no. 579, 7 Nov. 1902. See also *Report of the Miners' Phthisis Commission, 1902-1903*, p. v, par. 2; and *Star*, 8 Nov. 1902, "Miners' Phthisis".

381 PRO, CO, 291/46, offices, Secretary of the Home Office to Chamberlain, 13 Nov. 1902.

382 *Cornubian*, 23 Jan. 1903, "Sickness in Dolcoath".

383 Cd. 2091, 1904, p. 3; *BMJ*, p. 216, "The Health of Cornish Miners".

384 Cd. 2091, 1904, p. 5; *Report of the Miners' Phthisis Commission, 1902-1903*, p. 8, q. 3, evidence of Dr. F. Napier. See above, chapter 2.

385 *Cornubian*, 4 July 1902, "Mining".

386 PRO, CO, 291/46, offices, Secretary of the Home Office to Chamberlain, 13 Nov. 1902.

387 BRA, HE, v. 258, file 154M, F. Oats to C. E. Rube, 10 July 1902, enclosed clipping, [July].

388 *Cornubian*, 4 July 1902, "Mining".

389 PRO, CO, 291/60, despatches, Milner to Lyttelton, minute by Sir M. Ommaney. See also *Report of the Miners' Phthisis Commission, 1902-1903*, p. xxi, par. 71.

390 See, in particular, *Report of the Miners' Phthisis Commission, 1902-1903*, p. vii, pars. 8, 9.

391 Cd. 7476, 1914, p. 147; *Mining Journal*, 17 Feb. 1912, p. 159, "Miners' Phthisis: The Penalty for Neglect".

392 Fraser and Irvine, p. 5.

393 Merriman Papers, correspondence, R. Barry to JXM, 15 Dec. 1911.

394 Fraser and Irvine, p. 5.

395 *Cornubian*, 4 July 1902, "Mining"; BRA, HE, v. 258, file 154M, F. Oats to C. E. Rube, 10 July 1902, enclosed clipping, [July].

CHAPTER 11

THE NEGLIGENT YEARS 1902-1910

"If all the criminals in the Fort had been turned loose for five years, they would have done less harm to this community than the mining industry did in that time in this gold-stricken place, where blood is spilt like water, human lives thrown away like dirt, where lungs are turned to stone below ground, and above ground hearts turned to flint."---Ambrose Pratt, an Australian journalist, quoting the consulting mining engineer, E. J. Moynihan, 1910.¹

"It is a pity that in this country human life should be so cheap, and pipes, fitting and water so dear."---An anonymous miner, 1913.²

In 1903 the Weldon Commission in the Transvaal produced a "valuable" report on silicosis.³ It established dust as the cause of the disease and recommended both wet and dry precautions for the prevention of dust: the use of water to allay dust at the point of production; and improved ventilation to dilute dust and gas concentrations.⁴ But in 1910 the Final Report of the Mining Regulations Commission showed that the death rate from the disease had not in any way diminished since 1903.⁵ Indeed, Donald

Macaulay, one of the two medical officers on whose testimony in 1907 the commission had almost solely relied for its findings on silicosis, declared publicly in 1909 that the annual death rate from the disease was "markedly" increasing. The newspaper report, which quoted him, added: "The number of cases coming under [Mr. Macaulay's] notice [in 1909] exceeded the total number seen by him during the previous three years".⁶

Such statistics indicated, as "no verbal evidence" could

the callous indifference of the Mining Companies to safeguarding the health of their workmen and the arrant negligence of the government in passing regulations which failed to regulate.⁷

The statistical data also confirmed the misgivings of objective commentators that during the period 1903 to 1910 both the state and the mining houses had merely "tinkered with the problem of phthisis".⁸

In its report the Weldon Commission dispelled a number of rationalisations which the mineowners used to deflect from the industry its responsibility for causing the disease. As Sir Thomas Oliver explained, one of the spurious theories related to the atmospheric dustiness of the Reef:⁹

Attempts have been made to minimise the relation of the lung disease to the dusty nature of the occupation by assigning to the dust-storms that sweep over Johannesburg some part in the production of the malady.¹⁰

Neither Oliver nor any of the Transvaal doctors attached any importance whatsoever to such an illogical idea,¹¹ which the Weldon Commission also rejected.¹² But as late as 1910 the rationale still had vigorous proponents amongst certain members of management, who used it to oppose the introduction of underground mechanical ventilation.¹³

The industrialists also contended that the miners who had died had been "already in ill-health or predisposed towards consumption", and had sought renewed health on the Reef, which had a reputation for being a sanatorium.¹⁴ The Weldon Commission refuted the idea completely.¹⁵ Indeed, doctors asserted that the miners, "whose lungs have been fairly macadamised",¹⁶ were "for the most part men of initially robust physique".¹⁷ Even so, the canard persisted until as late as 1907. The mineowners, including Sir George Farrar, continued to protest that miners with initially weak lung conditions "vitiating" the death-rate statistics of the Witwatersrand mines, so increasing "our mortality" with "cases which in strict equity do not belong to it".¹⁸

It was only in 1910 that the mineowners were obliged to give up the idea that they could transfer the blame for the occurrence of the disease from the Witwatersrand gold mines to other parties. The Mining Regulations Commission showed that 45 per cent of the underground white workers had worked only in South Africa and solely since 1902.¹⁹ The Van Niekerk

Commission, also known as the Medical Commission, confirmed these findings in 1912, when it reported that 35 per cent of underground workers, who had contracted silicosis, had been born in South Africa.²⁰

Amongst the chief aims of the Weldon Commission were those to dispel myths surrounding the incidence of the disease and to identify its cause as being fine silica dust. Also, its epidemiological findings were equally important. The commission conducted an independent survey to determine the prevalence of the disease. It circularised 200 mines asking management to organise medical tests for the white underground workforce. The response was lethargic: there were only forty-five returns out of seventy-one "which might reasonably have been expected to comply with the request".²¹ In contrast to the collective concern with silicosis which the Association of Mine Managers exhibited, the poor response to the survey showed that at an individual level most mine managers were indifferent to the problem.²² As we shall see later, a great many mine managers showed equally low levels of personal commitment in implementing dust prevention methods during machine drilling and blasting.

On each of the forty-five mines, which answered the survey, mine doctors clinically examined only volunteers. Under such random conditions the study was both unscientific and medically unsound: it established a crude prevalence of the disease without assessing the degree of disability. Also, although

the investigation identified the respondents as "miners", they were, in fact, all underground workers.²³ Consequently the prevalence figures which follow are not definitive for miners as a discrete category of workers. Another reason why the survey results underestimated the prevalence of the disease amongst miners was that the medical examinations were voluntary. Out of a possible 4 403 underground workers only 1 210 submitted themselves for medical examination.²⁴ The mine doctors believed that many miners did not come forward because they were frightened to do so:

A great number of men suspecting they had the disease themselves, avoided being medically examined, fearing to be told that they were subjects of a disease they themselves know to be fatal, or, anyhow, a very frequent cause of death.²⁵

The survey showed that 187 respondents, or 15,4 per cent, were confirmed as being affected by the disease. Another eighty-eight workers, or 7,2 per cent, were "suspected" silicotic cases. Significantly 172, or 91,8 per cent, of the 187 definite silicotic cases had been employed as rock drillers;²⁶ and their average length of work on the machines was 6,49 years. The average age of all respondents was "only" 35,5 years.²⁷

The study showed, too, that miners who had operated rock drills solely in the Transvaal had done so for only 4,8 years, whereas miners who had done machine work in other parts of the world as well as in

the Transvaal took several year longer to contract the disease. This trend had serious implications: it indicated to doctors that "miners' phthisis is more fatal here than in most other mining centres".²⁸

In 1904 the findings of the Haldane Commission confirmed the trend. The commissioners in Cornwall found that: "The recent rise in the death rate is mostly due to the effects of work in mines in South Africa".²⁹ Also, although the Haldane Commission conceded an excessive mortality amongst youthful miners who had operated rock drills only in Cornwall,³⁰ the Cornish rock drillers lived longer than their counterparts on the Witwatersrand: the average age at which Cornish rock drillers died was 37,5.³¹ The average number of years of rock drill work which caused severe incapacitation in Cornwall was 8,4 as compared to 4,7 on the Witwatersrand.³²

The report of the Weldon Commission implicitly acknowledged the trend. But the commissioners weakened the finding with a conclusion which attempted to minimise the dangers of the disease on the Witwatersrand:³³

A considerable section of the group have [sic] been exposed to risks of contracting silicosis in other countries, where the work of rock drilling has been carried on under more or less similar circumstances.³⁴

The conclusion effectively concealed the trend, which showed clearly that rock drill work was more dangerous on the Witwatersrand than at any other mining centre.

It is possible that the limitations of the survey and the small size of the sample dictated the commissioners' cautious approach. More important, they undoubtedly did not want to impair the progress of the industry by creating a state of panic. They believed that the survey statistics, unreliable and inaccurate as they were,³⁵ were sufficiently morbid to promote reform.³⁶ Their conclusion that the average working life of a rock driller was 6,49 years should, indeed, have been sufficient cause for serious public concern.³⁷ Also, although Transvaal medical opinion held the average working life of a rock driller to be seven to nine years,³⁸ this figure may have been an overestimate. Sir Thomas Oliver was convinced that it was even shorter.³⁹

The Transvaal commissioners implicitly conceded, as many doctors did openly,⁴⁰ that the prevalence figures for the disease were far too low.⁴¹ Even so, both the commissioners and the Transvaal medical profession were unduly sanguine about the death rate from silicosis amongst ordinary, or "general miners".⁴² This was because they concluded that the evidence did not show that it was "higher here than in other mining centres where miners' phthisis is prevalent".⁴³ In this respect the Transvaal mining authorities and the doctors displayed the age-old disregard for silicosis in its slow-developing form. Their concern was with accelerated silicosis rather than with the chronic lung complaint of miners which

such parties took for granted as one of the occupational hazards inherent in mining.

Because the accelerated form of the disease was so markedly prominent in rock drillers, the focus of the Weldon Commission report and the subsequent regulations was directed almost entirely at preventing the incidence of the disease amongst the machine men. Little, if any, attention was paid to preventing the dust to which general miners, including hand drill supervisors and specialist pitmen, and the rest of the underground workforce were exposed.

As we shall show later, such neglect had morbid consequences. General miners undoubtedly contracted a slower developing silicosis than the rock drillers. Even so, the underground dust levels remained so excessive that the general miners were disabled and died within fifteen to twenty years of first dust exposure. Like the rock drillers on the Witwatersrand, the general miners also contracted a form of silicosis which was more rapidly progressive than the chronic and slow-developing silicosis amongst their counterparts at other hard rock mining centres. For instance, Australian and Cornish hard rock miners, who succumbed to chronic silicosis, were disabled at an average age of fifty and fifty-three years.⁴⁴ But few general miners on the Witwatersrand lived until they were fifty. Indeed, in 1910 Donald Macaulay claimed that any comparison between miners over fifty on the Witwatersrand with miners of a similar age in

other centres was virtually impossible "simply because there were very few miners" of that age on the Reef: in 1910 the average age of death for all miners on the Witwatersrand, including rock drillers and general miners, was a mere thirty-nine years.⁴⁵

In 1904 the findings of the Haldane Commission on the "Health of Cornish Miners" were similar to those of the Weldon Commission in the previous year. The British commissioners unequivocally identified dust as the cause of the disease.⁴⁶ Their conclusions on the progress of the disease, however, differed from those of the Transvaal commissioners. The British commission found that pulmonary tuberculosis was the terminal feature in most cases, whereas the Transvaal commission established that a "dry" form of silicosis predominated.⁴⁷ Both commissions also agreed that: "Dry mining should, as far as possible, be converted into wet mining".⁴⁸

In trying to convert dry mining to wet mining the British commission recommended the legal enforcement of the use of water jets in conjunction with rock drills and that wet methods accompany blasting.⁴⁹ The Haldane Commission regarded the dust generated in blasting to be as dangerous if not more so than the dust raised by the machines. The Cornish commission therefore prescribed two detailed measures for the control of the procedure: first, the installation in development tunnels of a water blast, based on the James model, to lay the dust after the dynamite

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explosion: and second, the prohibition of re-entry to blasting zones until the dust had dispersed.⁵⁰

Finally, unlike the Weldon Commission, which recommended improved general ventilation as an urgent necessity,⁵¹ the Haldane Commission concluded that, except for the "dead ends" in the development tunnels, the distribution of the air in the Cornish mines was "adequate".⁵² Although the British commissioners urged the industrialists to install brattices to facilitate ventilation by natural means, they did not consider the installation of mechanical fans to be necessary.⁵³

This conclusion concerning Cornish ventilation had significant repercussions on the Witwatersrand mineowners.⁵⁴ As we have seen, the ventilation of most of the gold mines was markedly inferior to that of the Cornish tin mines.⁵⁵ In many Witwatersrand mines artificial ventilation was warranted, as the mining engineers advised their directors.⁵⁶ But because of the costs, the Randlords ignored the advice. Instead, they used the claim concerning the soundness of natural ventilation in the Cornish mines to argue spuriously by analogy that the "ventilation of the mines on the Witwatersrand generally compares favourably with that of any other metalliferous mines in the world".⁵⁷

Because of the excessive mortality amongst Cornish rock drillers, the Haldane Commission, like the Weldon Commission, stressed dust precautions which

would lessen the risks for machine operators. But the British commissioners were also mindful that silicosis took a heavy toll among general miners, even if they died at an older age than rock drillers. Therefore their recommendations included the introduction of dust prevention measures to diminish the "death-rate among [general] miners living in Cornwall, which has always been very high in the case of men over about 40".⁵⁸

Within six months of the publication of the Report on the Health of Cornish Miners, on 1 January 1905 new regulations for the control of dust in Cornish and Devon mines came into force.⁵⁹ Also, in 1906 the British government authorised the census registrar of the Redruth District Council to compile special records listing the deaths from silicosis amongst miners. Such epidemiological records also contained other comprehensive occupational and geographical data. When Cornish miners died of silicosis in the Redruth district, it was now possible to show whether or not they had been rock drillers, to identify the geographical area in which they had operated the rock drills, be it in Cornwall or overseas, and to demonstrate the length of time they had operated the machines. Such epidemiological data enabled local health officers to monitor the incidence of and mortality from silicosis on the Cornish mines and to assess the effectiveness of the British regulations and the dust precaution measures.⁶⁰ They

are a valuable source, too, as we shall show later, for assessing the mortality amongst Witwatersrand rock drillers who, as migrant miners, returned home to Cornwall to die.

Although the Transvaal administration later modelled its regulations on those framed in Britain,⁶¹ the Witwatersrand gold mines were far less successful than the Cornish tin mines in diminishing the severity of the disease. In 1912 the Royal Commission on Metalliferous Mines and Quarries in Britain reported that the 1905 "rules" had proved "effectual" in reducing "the excessive mortality from lung disease" in both rock drillers and general miners, so ensuring that both kinds of miners lived appreciably longer lives.⁶² In 1912 dust levels in the Cornish mines were still high, as the Royal Commission conceded. Also, some employers and workers flouted the regulations.⁶³ Even so, by 1912 conditions on the Cornish mines had undoubtedly improved since 1905.

Objective commentators attributed the improved conditions in the mines of Cornwall to the commitment to the "spirit" of the regulations of both the British Department of Mines and many of the employers.⁶⁴ The regulations were of a general nature and did not prescribe detailed rules. Even so, without compulsion and despite the increased capital and working costs, many Cornish industrialists, for instance, laid on water pipes in development ends and stopes, so ensuring that water was both available and convenient

for miners to use.⁶⁵ Also, the Cornish employers tended to observe the dust precaution regulations in connection with blasting. Most employers installed water blasts⁶⁶ - a coarse spray of water which operated under air pressure for approximately thirty minutes - to allay the dust after blasting.⁶⁷ As significant, relatively leisurely mining conditions, especially in development, where there was minimal pressure to "speed up", assisted miners to observe the regulated re-entry time to blasting zones, so protecting them from inhaling dust.⁶⁸ Finally, the hosing of broken ore with water safeguarded hand drillers in the stopes from excessive dust exposure.⁶⁹

The general co-operation by the controlling bodies, both state and private, had a beneficial effect on workers, as it helped overcome initial worker resistance to the use of water-allaying appliances.⁷⁰ As important, the mutual state-employer commitment to eliminate the disease provided miners with an educated awareness of the need to allay dust with water at its point of production. In brief, joint action by inspectors and management helped promote worker co-operation in observing dust precautions.

By contrast, the position was completely different on the Witwatersrand. Here there was virtually no positive co-operation between the state and the industry concerning the problem of silicosis on the gold mines. On the one hand, the government took an

unduly long time to enact regulations for dispelling dust; and after the rules had been promulgated the Transvaal Department of Mines lacked the resolution to enforce them. On the other hand, the mineowners, too, did the bare minimum of their accord: they waited for the government to legislate and then to enforce the legislation. When both controlling parties failed to achieve any tangible results, they blamed the workmen for their lack of responsibility in observing the available dust precaution measures. Indeed, both Transvaal controlling authorities, namely the state and the mineowners, honoured the regulations in the breach rather than in the observance.

The Weldon Commission completed its investigations in May 1903 and its report was published in October.⁷¹ Wilfred Wybergh, the Commissioner of Mines, pre-empted some of the commission's recommendations by framing regulations for sanitation, ventilation and change houses.⁷² As we have seen, the rules for ventilation and change-houses, incorporated in the 1903 mining regulations, were identical to those in force under the South African Republic.⁷³ The Weldon Commission did not give specific instructions for the use of water, but stressed that wet mining methods should replace dry methods. Its recommendations section concluded:

While strongly advocating the use of water for this purpose, we consider that experience only will show which is the most suitable form to be adopted and which will

at the same time cause least discomfort to the miner.⁷⁴

In April 1904, Milner gave a confident reply to the question raised by the new Colonial Secretary, Alfred Lyttelton, as to what legislative measures the Transvaal administration contemplated in response to the Weldon Commission's report.⁷⁵ Milner detailed the measures already adopted and declared that the Department of Mines had reacted positively and assertively to each of the commission's suggestions.⁷⁶ Milner's despatch to Lyttelton was so reassuring that the Colonial Office undoubtedly believed that the Transvaal administration had the situation under complete control. After receiving Milner's despatch the Colonial Office asked one more question concerning safety fuses, for which Milner had yet another confident answer.⁷⁷ After this reply Lyttelton allowed the matter to lapse: he made no further official enquiries of his own accord.⁷⁸

With the death in 1903 of William Sproston Caine, the MP for Camborne,⁷⁹ the parliamentary concern of Cornwall with the problem stopped. Caine's successor, Sir Wilfred Lawson, showed little concern with mining matters relating to the Witwatersrand. But there were other interested individuals, particularly parliamentarians and doctors, including Sir Thomas Oliver and John Scott Haldane.⁸⁰ The Colonial Secretary forwarded their queries concerning the problem of silicosis to the Transvaal Governor, so keeping the issue alive.

The confidence of the Colonial Office in the ability of the Transvaal administration to enact and enforce effective measures for the prevention and control of silicosis was entirely misplaced. As we have seen,⁸¹ the Transvaal Department of Mines administered most rules for the improvement of sanitation, change houses and ventilation singularly ineffectively and in a piecemeal fashion. Also, most mineowners, who were indifferent to the health of their workforce, refused to co-operate voluntarily with the Department of Mines, principally for reasons of cost. When the enforcement of regulations compelled them to comply with departmental directives, they observed only the letter of the law and did so with great reluctance. In view of their poor track records concerning health, it is therefore not surprising that both the state and the employers woefully neglected the Weldon Commission's urgent directives concerning the use of water to allay dust. Also, both controlling parties did virtually nothing about regulating blasting, which they knew to be a mining process responsible for generating even greater dust densities than rock drills.

From the time of the publication of the Weldon Commission report a curious kind of paralysis overcame the Transvaal administration, particularly the Department of Mines. In his despatch of 18 April 1904 Milner explained to the Colonial Office that no regulations had as yet been framed with regard to wet

mining. He indicated, however, that management was conducting experiments with dust allayers and he used the Chamber's competition for the best water device as an explanation for the delay.⁸² Although the Chamber announced the results of the competition in April 1904,⁸³ the Transvaal administration continued to do nothing. In June 1904 Milner's excuse for postponing legislation prescribing a "dust laying device" was that the administration was awaiting the report of the Haldane Commission, which was still investigating the matter.⁸⁴

Milner's decision to postpone action worried a few individual members of the House of Commons and two concerned doctors in the Transvaal, Charles Lane Sanson, the Witwatersrand Medical Officer of Health, and a mine doctor, Norman Pern.⁸⁵ As only a few individual mine managers were taking steps to control dust with water, both these local doctors wrote journal articles urging the need for state regulation.⁸⁶

Between the end of 1902 and the beginning of 1904 Johannesburg newspaper reports indicated that there was a hubbub of watering activity on the mines.⁸⁷ This was largely experimental work connected with the Chamber's competition; and after the Chamber had announced the results, activity came to a virtual standstill. After 1904 mine managers were generally apathetic about the use of water. Also, for a number of reasons, which we shall investigate later,

throughout the period 1902 to 1906, many miners resisted using the water appliances and wearing the respirators.

In the meantime, in 1904, Sansom, the Witwatersrand Medical Officer of Health, had great difficulty in compiling statistics for the death rate from silicosis. The Colonial Secretary required such data for presentation to the House of Commons.⁸⁸ Sansom's figures were so incomplete and meaningless that Sir Montague Ommanney, a member of the Colonial Office declared, "This will never do for a return."⁸⁹ Even so, Milner, unlike the local Cornish authorities, did not authorise the census registrar to keep specific records on silicosis for future use in monitoring the disease.

After receiving the report of the Haldane Commission, Milner told Lyttelton that regulations were imminent:

This matter has been discussed in the Executive Council, and it has been decided to amend the Mines, Works and Machinery Ordinance [of 1903] so as to empower the Lieutenant-Governor to make regulations to safeguard the health of persons employed in Mines and Works.⁹⁰

Despite Milner's assurance to Lyttelton that "legislation in this direction will shortly be passed",⁹¹ a year elapsed before the administration acted. In September 1905 Sir Arthur Lawley, the Lieutenant-Governor, organised the passage in the legislative council of the necessary amendment to the

mining ordinance to enable legal remedies for the control of silicosis to be promulgated later.⁹² Finally, in December 1905 the Department of Mines gazetted the dust precaution regulations, which took effect from 1 January 1906.⁹³

Admittedly there were legal obstructions to the enactment of the new health regulations. Until the Mines and Works Ordinance of 1903 had been amended in September 1905, the Lieutenant-Governor lacked the powers to make regulations to safeguard the health of mine employees. Even so, the Transvaal administration showed no foresight in anticipating this eventuality. Nor did it go out of its way to speed up the process of amending the 1903 ordinance. It would have been a mere formality for the governor to have proposed, at any one of the legislative council's monthly meetings, and for the legislative council to have passed, the necessary amendment to the ordinance, had Milner taken the issue seriously and not been so blatantly indifferent. In contrast to the speed in 1904 with which Milner averted the spread of the infectious disease, bubonic plague, and by-passed legal obstructions to do so,⁹⁴ the Transvaal administration acted in an extraordinarily dilatory fashion with respect to the problem of silicosis.⁹⁵

The lack of commitment by the Transvaal administration to regulating dust prevention on the mines caused concern to prominent organisations and individuals both in Britain and the Transvaal. In

October 1905 Sir Thomas Oliver forwarded to the Colonial Office a copy of his recent lecture to the North of England branch of the British Medical Association. In the article, entitled "An Address on Rand Miners' Phthisis", Oliver stressed the need for the rigorous institution of preventive measures against dust in both drilling and blasting. Tactfully, and without additional comment, Lyttelton forwarded it to Lord Selborne, Milner's successor, in the hope that it would spur the Transvaal Governor to accord the occupational disease the administrative seriousness which it warranted.⁹⁶

John Scott Haldane, like his fellow commissioner, J. Telfer Thomas,⁹⁷ was more actively interventionist than Oliver. Haldane suspected that the controversy amongst Transvaal chemists and doctors had delayed the introduction of dust precaution regulations. The argument concerned the question as to whether it was dust or noxious fumes that was the primary cause of silicosis on the Witwatersrand mines. In a lengthy article, published in the *Mining Journal*, Haldane did not dispute that nitrous fumes might play a part in the cause of the disease. In his view the presence on the Witwatersrand of nitrous fumes, so markedly in excess of those in British mines, strengthened the need for urgent improvements in the ventilation of the gold mines. Even so, Haldane stressed adamantly that both the Transvaal and the Cornish commissions, in following universal medical opinion, had found that

silica dust was the "main, and practically speaking the sole, cause of miners' phthisis". He concluded:

I trust there will be no further delay about the adoption in the Transvaal of remedies on the lines of those which have been applied in English mines where the same terrible disease has prevailed.⁹⁸

After the publication of his article Haldane continued to pursue the issue relentlessly. He asked his brother, Richard Burdon Haldane, the British Secretary of State for War, to use his influence with the new Colonial Secretary, Lord Selborne, to exert pressure on the Transvaal government to introduce regulations. In his letter of January 1906 to Elgin, Richard Haldane wrote:

My brother...J. S. Haldane...tells me that the Transvaal Government has done nothing...He says the Cornish miner will not go [to the Witwatersrand] because, in the absence of watersprays, no miner lives for longer than an average of 5 years...If the Cornish miners find no difficulty in adopting the Home Office Rules surely the Transvaal miners should not [have difficulty].⁹⁹

Haldane's letter elicited from Elgin a polite query to Selborne. The Colonial Office had heard nothing from the Transvaal administration since Milner's despatch of August 1904. Elgin therefore asked Selborne whether the administration had "yet made any recommendations as to legislation for the prevention of the disease". Elgin also gently reminded Selborne that in January 1905 Lyttelton, had sent Milner "copies of the rules adopted in mines in Cornwall".¹⁰⁰ By the time that Selborne received the

despatch the new Transvaal mining regulations had been gazetted; this circumstance dictated his positive reply to Elgin. Although the Transvaal administration provided plausible excuses, apologies and explanations for its procrastination,¹⁰¹ its delay in promulgating the regulations can be construed as proof of negligence.

On the Witwatersrand, too, organisations and individuals exerted pressure on the Transvaal administration to enact dust precaution regulations. In August 1904 the Mine Managers' Association urged the Chamber to request the government to make compulsory the use of water appliances. The Association stressed that, "however imperfect" they were, the appliances would be "better than nothing at all" in preventing the mortality from the disease.¹⁰² In response to the mine managers' request, the Chamber of Mines, through its immediate past chairman, Sir George Farrar, in the legislative council asked the acting Commissioner of Mines, Horace Weldon, whether legislation was contemplated. Weldon's reply was indefinite, if not evasive:

The prevalence of miners' phthisis has occupied the attention of the Government for some time, and it has been decided that legislation shall be introduced at an early date with the object of reducing the prevalence of this disease.¹⁰³

D. Wager Bradford was responsible for the resolution of the Association of Mine Managers.¹⁰⁴ As a regular member of the Chemical, Metallurgical and

Mining Society of South Africa, Bradford shared the majority view of the organisation, which William Cullen expressed in his 1905 presidential address:

But so long as human nature is human nature, polite recommendation will do comparatively little good unless backed up by legislation...

The question of miners' phthisis has been quiescent for some time, but whatever differences of opinion were disclosed by the discussion which took place during the session before last [regarding the primary cause of miners' phthisis], we were all agreed that some form of spraying would mitigate the dust trouble. Why then has there been no legislation?¹⁰⁵

From 1903, beginning with William Cullen's lecture on the subject,¹⁰⁶ the Chemical Society, as it was colloquially called,¹⁰⁷ addressed the topic of silicosis either directly or indirectly at each of its monthly meetings until 1910.¹⁰⁸ Indeed, one of the most important lectures on the problem was the second part of the paper, entitled "Safety Measures in Mining", which the two mine doctors, Donald Macaulay and Louis Godfrey Irvine, jointly presented at the beginning of 1906.¹⁰⁹ In 1907 the two doctors presented the paper as evidence to the Mining Regulations Commission.¹¹⁰ The doctors' findings concerning the prevalence of and mortality from silicosis on the Witwatersrand gold mines strongly influenced the commissioners. Long before they had completed their report and two years before its publication in August 1910,¹¹¹ in November 1908 the commissioners sent the Minister of Mines, Jacob de Villiers, an urgent directive in which they pressed

him to enact immediately more comprehensive mining regulations for the prevention of dust.¹¹² In view of the Chemical Society's commitment to preventing the disease, it is therefore not surprising that in 1905 Weldon sent the draft dust precaution regulations for the prevention of dust to the organisation for its appraisal.¹¹³

The Transvaal regulations, which came into effect on 1 January 1906,¹¹⁴ were similar to those framed by the Home Office: both the British and the Transvaal regulations prescribed the use of water with machine drills and prohibited the return of miners to blasting areas until the air was clear. One major difference was that the British regulations made provision for watering broken rock both in the stopes and development ends, whereas in the Transvaal the wetting of ore was confined to development tunnels. In contrast to the British rules, which aimed to reduce silicosis amongst both rock drillers and general miners, the emphasis of the Transvaal rules was on preventing the incidence of the disease amongst rock drillers.

Another significant difference related to responsibility for the observance of the regulations. In Britain mine managers were allowed to delegate to other mine officials the onus for ensuring that the miners carried out the dust precaution regulations. In the Transvaal the mine managers had to bear full responsibility for disciplining the miners.¹¹⁵ Like

the miners, the mine managers in the Transvaal could be held "criminally responsible" if the regulations were disobeyed.¹¹⁶

As we have seen, Haldane claimed that the British rules worked reasonably well.¹¹⁷ But from the start the Transvaal 1906 regulations were a "dead letter".¹¹⁸ When they had pressed for the promulgation of regulations, all the organisations and individuals had stressed that the miners rather than management needed legislative compulsion to observe precautions: all the parties had punctuated their demand for legislation with illustrations of the "criminal negligence" of miners, who "needed to be saved from themselves".¹¹⁹ The comment of Edgar F. Rathbone, a mining engineer and a former member of Kruger's inspectorate, was typical: "It is the business of Government, I maintain, to prevent the labourer from practically committing slow suicide."¹²⁰

Also, in 1908, before the members of the Mining Regulations Commission had finished their report on the health conditions on the mines and had framed the new mining regulations, they urged the Minister of Mines, Jacob de Villiers, to introduce more comprehensive legislation to allay dust. In their directive to the minister the commissioners, likewise, attributed non-compliance with the 1906 regulations "largely" to the "indifference and neglect of the Miner himself". Even so, the commissioners also held management "partly" to blame because of its "failure"

to supply water. Most mineowners refused to install water pipes and insisted that the miners use the cheaper and less efficient portable atomisers and sprays.¹²¹

As we shall see later, the refusal of the mineowners, because of expense, to provide water under pressure with pipes created such unpleasant and unhealthy underground working conditions, that many miners resisted using the water appliances. The caustic remarks of Thomas Mathews, one of the organisers of the Transvaal Miners' Association, typified the miners' resentment at this omission:

In Cornwall they have pipes off the main pipe, and they use the water in spraying rises and such like, and if it can be done in dark benighted Cornwall it can be done in an up-to-date, intelligent place like Johannesburg.¹²²

The Association of Mine Managers claimed that it had initiated the demand for compulsory legislation. But it lodged strong objections to the 1906 regulation both in their draft and final forms:¹²³ the organisation declared them to be too "drastic".¹²⁴ Mine managers did not believe that "downers", or so-called "wet" holes, particularly those in the stopes, required the compulsory use of water: they wanted water to be used only in drives and "rises". Also, they believed that management and miners should not share the responsibility for damping broken rock: "The onus", they declared, "should be on miners entirely."¹²⁵ More important, if their employees

flouted the regulations, the mine managers resented being brought to trial under criminal law. They therefore stated that the criminal sanction should apply solely to the miners:

The mine managers' responsibility should be limited to the providing of these remedial appliances, and that if they are not used the criminal responsibility rests with the workmen, and not on the mine managers.¹²⁶

In February 1906, at an interview with the Mine Managers' Association, Weldon "particularly" urged the mine managers to co-operate "in seeing that the new regulations were strictly carried out by miners" and to report breaches of the regulations to mine inspectors. In Weldon's view this was not a difficult procedure as power had recently been given to mine inspectors to try "minor breaches of the regulations"; inspectors' courts were allowed to inflict penalties up to £5, "thus obviating the necessity for taking such cases into [the Magistrate's] Court".¹²⁷

The mine managers were unwilling to carry out Weldon's mandate. They claimed that "it is no good" to enforce the regulations, because:

Our best men are so independent that they will go off to another mine where no pressure is exercised, and we shall lose our best men.¹²⁸

The fact that workmen moved with ease from jobs on strictly regulated mines to positions on mines where discipline was lax is evidence that many mine managers ignored the regulations entirely.

In 1906 the Mine Managers' Association had been "outraged" by William Cullen's claim that its members "might let things slide".¹²⁹ Cullen was not being critical of the mine managers when he made the statement to Weldon. At a meeting, where a deputation from the Chemical Society, the Johannesburg Medical Association and the Society of Mechanical Engineers interviewed Weldon asking him to change the regulations, Cullen's intentions were well-meaning and stemmed from "humanitarian" considerations. He contended that the mine managers "had so many regulations to attend to of one kind or another" that they should be relieved of the "extra burden" of inspection, which the new regulation entailed: by acting as policemen, mine managers were obliged to ensure that the miners adhered to the dust precaution regulations.¹³⁰ Clearly the Mine Managers' Association took Cullen's statement out of context. Even so, from April 1906, when Weldon notified the mines that "the regulations would thereafter be strictly enforced",¹³¹ most mine managers did, indeed, "let things slide".

From April 1906 to July 1907, while the regulations were being flouted consistently, the inspectors' courts tried only twenty-two miners - each miner was fined £5 - for infringing the new regulations.¹³² When members of the Chemical Society criticised the mine managers for their failure to take a keen interest in the "lives and interests of their workers", particularly with regard to the prevention

of silicosis,¹³³ J. Wager Bradford, the manager of the Langlaagte, sprang to their defence. Bradford had a strong commitment to eliminating dust in his own mine. Even so, he tried to exonerate management's general disregard for the new regulations. He conceded that the institution of the inspectors' courts was "beneficial". He added: "Men will often do things for the sake of their pockets when they will not do them for the same sake of their health." But his subsequent comments, intended to exculpate mine managers, indicted them instead:

At the same time it should be noted that shift bosses do not like to report their men for such breaches of regulations, and some managers are opposed to such reporting, believing that the Mines Department should only be called in in serious cases...

Regarding dust, we have endeavoured to lay it to some extent, as you all know. There are regulations which provide for using sprays in all the faces, but unfortunately these regulations are more honoured in the breach than in the observance. The sprays, which have been introduced on most of the mines with which I am familiar, are efficient in reducing dust, but they have not been used, and it is practically impossible to get the men to use them, and the Mines Department, I think, recognises the fact.¹³⁴

In brief, most mine managers refused to do the policing because they expected the inspectors to do it themselves.¹³⁵ During the period, in which the inspectors' courts fined twenty-two miners for not observing the dust prevention regulations, the Transvaal Mines Department did not prosecute one manager in the magistrate's court for a similar offence. In 1906, in evidence to the commission

investigating mining by single outlet, Weldon clarified his reluctance to prosecute management:

There can, however, be no question but that the pernicious practice of the making the Government responsible through its servants for the sound condition of mine workings...should be avoided. In the first place, to relieve the manager and his staff of the responsibility for the safety of the lives of the miners working under him is inherently bad in principle, and in the second place would tend to cause friction between the Government Inspectors and the mine officials.¹³⁶

Weldon not only wanted to obviate friction between his department and management: he went out of his way to avoid it studiously. Weldon knew on which side his bread was buttered. He did not wish to run the risk of dismissal, which was the fate of his predecessor, Wilfred Wybergh, who had been the first Commissioner of Mines under Milner's administration. It is believed generally that Wybergh resigned in 1903 because he was found to be incompetent in his handling of a relatively unimportant matter concerning a contract.¹³⁷ It was not because of his opposition to the introduction of Chinese labour, which he voiced publicly only after he had left office.¹³⁸ Even so, while he held office Wybergh was not afraid to oppose the wishes of the Randlords. His desire to alter the Gold Law to the disadvantage of the mineowners, his unpopular administrative changes and his well-known sympathy towards white labour made the mineowners antagonistic towards him.¹³⁹ As Milner was well aware, Wybergh, who held such an important position, was not the compliant official whom the Randlords wanted.¹⁴⁰

Wybergh "honestly" did not believe that he could have acted "otherwise" in his handling of the contract.¹⁴¹ Even so, his conduct evoked the "censure" of the Lieutenant-Governor, Sir Alfred Lawley, and Milner;¹⁴² and Lawley allowed Wybergh to resign "voluntarily".¹⁴³ The evidence, however, suggests that Milner and Lawley used Wybergh's inept supervision of the contract as a pretext for getting rid of an official who was so evidently out of favour with the mineowners. Indeed, H. Lambert, a member of the Colonial Office, stated: "The whole story is to my mind most unsatisfactory."¹⁴⁴

Weldon did not wish to antagonise the Randlords. All the same, his department's policy of co-operating with management went to the other extreme. Under the guise of harmony, the Mines Department actively and deliberately colluded with mine officials, so placating the mineowners. When management flouted the dust prevention regulations by refusing to discipline the miners, it was the duty of the Department of Mines to prosecute management. But Weldon did not enforce the regulation. Instead, he surrendered. He withdrew all the dust prevention regulations on the ground that the men objected to them.¹⁴⁵

The miners did, indeed, resist the use of water claiming that the atomisers used on most mines super-saturated the air, so causing them to contract pneumonia.¹⁴⁶ But the regulations did not prescribe the use of atomisers, as Weldon told a deputation from

the Transvaal Miners' Association, which met him "in camera".¹⁴⁷ Weldon notified the Chamber of the miners' objections to the atomisers. In reminding the Chamber that regulations did not prescribe atomisers, he requested the industry to supply alternative water appliances, which would not create "the saturating mist round the machine and workers".¹⁴⁸ But the mineowners did not co-operate with Weldon and continued to provide only the portable water devices.¹⁴⁹ In the face of continued resistance by the miners to using appliances which over-saturated the air with moisture, Weldon did not enforce the regulations. Instead, he withdrew them.

The members of the Mining Regulations Commission were dismayed by management's refusal to lay on water under pressure with pipes. In their 1908 directive to de Villiers, they urged the minister to introduce a new regulation which would prescribe such an obligation in detail.¹⁵⁰ An accompanying injunction by the commissioners also implicitly indicted the Department of Mines for its previous neglect. It recommended: "That the inspectors of the Mining Department be instructed to pay special attention to the enforcement of the amended regulation."¹⁵¹

The directive from the Mining Regulations Commission was embodied in new regulations which took effect almost immediately, in December 1908.¹⁵² Although criminal sanction was still attached to miners who refused to use water, management was

compelled to modify the watering system in such a way that miners were no longer subjected to working in a super-saturated atmosphere. The 1908 regulation stipulated that all mines provide "a continuous supply of water to working places". Despite its intention being clear, the phrase, "a continuous supply of water", caused "confusion" to management. In May 1909 a meeting between the Association of Mine Managers and the inspectorate resolved that the regulation be clarified by detailed instruction. Two additional regulations defined the phrase: first, management had to install water pipes to within a reasonable distance of all development faces, so that when the miner attached a hose to the pipes the water could be brought directly up to the face; and second, equivalent procedures had to be adopted in dry and dusty stopes as well. At the same time, in a departmental circular, the new Government Mining Engineer, Robert Nelson Kotze, reminded management that compliance with the new regulations was "essential". Despite the objections of the mine managers that the regulations were now too detailed and rigid, in October 1909 Kotze insisted that they be retained. Kotze made it clear that the Department of Mines expected management to observe "the spirit of the regulations".¹⁵³

R. N. Kotze, who replaced Weldon in 1908,¹⁵⁴ was a well-motivated official, but he had yet to find his feet. More important, he needed unqualified

government support for the strict enforcement of the dust prevention regulations. From 1907 to 1910, during responsible government in the Transvaal, J. de Villiers, the Minister of Mines, showed little, if any, concern with the problem of silicosis. In fact, de Villiers publicly both neglected the issue and minimised its seriousness. In 1907 he confided to John X. Merriman, the Prime Minister of the Cape Colony, that although he knew little about the disease, he thought that the miners' complaints were exaggerated. He added complacently that he would reserve judgement until the Mining Regulations Commission reported.¹⁵⁵ The commission was appointed in May 1907. But because of illnesses amongst the members, the investigators did not present their final report until three years later, in April 1910.¹⁵⁶ Even so, in 1908, in their urgent directive to him, the members of the commission apprised de Villiers of the seriousness of the disease. Also, after de Villiers had received the final report, but before its publication, at a joint session of both the Transvaal houses of parliament, the Minister of Mines deliberately played down the mortality of the disease, particularly amongst general miners. De Villiers claimed typically that the rock drillers were "blameable" for the incidence of the disease amongst themselves.¹⁵⁷

De Villiers was not the sole Het Volk minister who publicly under-emphasised the disastrous

consequences of the disease. Both Botha and Smuts, who had played a prominent role in trying to defuse the confrontation between the mineowners and the miners during the 1907 mine-wide strike,¹⁵⁸ neglected the miners' important grievance concerning the morbid consequences of silicosis, which the Final Report of the Mining Regulations Commission emphasised. In fact, after receiving the report in April, Het Volk's cabinet withheld its publication for four months. Finally, in August 1910, when the elections for the Union Parliament were in full swing, the Transvaal government published the report. The report's disclosures of the prevalence and mortality from silicosis aroused strong public support for the plight of miners. The enactment of legislation to provide compensation for miners who contracted the occupational disease was now a foregone conclusion.¹⁵⁹

In May 1910, when Botha appointed Smuts as Minister of Mines in his Union Ministry,¹⁶⁰ Smuts undoubtedly anticipated this eventuality. Also, he foresaw that if the government adopted the tripartite system of state insurance, as practised in Germany, the taxpayers would have to help fund the miners' compensation.¹⁶¹ The evidence, even if scanty, strongly suggests that Smuts was the person responsible for delaying publication of the report until August, so that state funding for miners' compensation would be transferred from the Transvaal to the Union of South Africa.

The Transvaal government under Botha and Smuts was indifferent to the problem of silicosis and neglected it.¹⁴² Consequently without strong government support the rhetoric of the new Government Mining Engineer was meaningless. Despite the good intentions of Kotze, under his leadership initially the Department of Mines did not enforce the regulations with significantly more vigour than it had done under Weldon. The inspectorate allowed management's *laissez faire* adherence to the "spirit" of the regulations to prevail without challenge. During the period 1907 to 1910 the inspectors' courts fined thirty-five miners for breaking the dust prevention regulations. This was not the result of management's commitment to the regulations: rather it indicated an almost total lack of discipline by management. During the same period the inspectors prosecuted one mine manager in the magistrate's court and one in its own inspectors' courts. But by 1912 Kotze's annual report, which criticised the mineowners for their neglect of the regulations, particularly those relating to the prevention of accidents, was evidence of his new-found confidence and ministerial support.¹⁴³ Until 1912, however, the paralysis of the Department of Mines, which had characterised Weldon's regime, persisted under Kotze with respect to the enforcement of the dust precaution regulations.

Admittedly the Department of Mines had a small staff. Until 1912, when the staff was increased slightly,¹⁶⁴ the inspectorate comprised eleven members.¹⁶⁵ In 1907 these inspectors were responsible for sixty-eight mines and 8 000 shafts in the Johannesburg, Germiston and Krugersdorp districts. It took each inspector more than a month to complete his round doing only routine work and "no other things".¹⁶⁶ Each inspector had an enormous list of every-day tasks, including the compilation of statistical and technical information both above and below ground.¹⁶⁷ Also, inspectors were obliged to spend the bulk of any extra time dealing with accidents.¹⁶⁸ This is not surprising as in 1912 the Witwatersrand mining centre was ranked fourth in the world as regards the occurrence of fatal mine accidents.¹⁶⁹ Kotze attributed the excessive accident rate on the Witwatersrand to "speeding up and rushing mining work to extremes".¹⁷⁰

Apart from the lack of time for ensuring compliance with the dust precaution regulations, the sheer physical size of the mines, as Dr J. Pratt Johnson indicated in 1916, prevented the inspectors from investigating obedience to the dust prevention regulations:

The magnitude of their [inspectors'] responsibility may be gathered from the case of one mine, to walk around which would take a man a full fortnight. Another single mine has as many as 300 to 400 working faces. It is obviously an impossibility for the above staff to carry out a thorough and adequate

inspection on all these mines.¹⁷¹

Consequently Kotze's only practical option was to call upon management to uphold the "spirit" of the dust prevention regulations.

In 1908, when Kotze took up his appointment, most of his inspectors, because of their previous experience in Britain, approved the United Kingdom principle of minimal inspection and were not "in favour" of surprise visits to mines.¹⁷² Instead, they tried "tactfully to elicit the help and co-operation" of management.¹⁷³ Consequently their practice was to arrange infrequent inspections by appointment. But management took advantage of the system. As soon as the inspector telephoned the mine manager from headquarters, Winchester House, to apprise him of the inspection, "in half an hour it [was] all over the mine".¹⁷⁴ Managers, mine captains and shift bosses ensured that the whole mine was on the "qui vivre".¹⁷⁵ As a miner explained in 1910, officials did the necessary window-dressing to comply only temporarily with the law:

On one mine on which I worked, water pipes were laid close up to the working face, but not a drop of water came through them for three months, and in another instance I was "raising" and sprays were only issued when a visitor from an inspector was expected, and instructions were given that they should be returned to store when the inspector had finished his inspection of the mine.¹⁷⁶

Kotze's early belief that management could be trusted to observe the abstract concept of the "spirit" of the regulations proved to be entirely misplaced. By 1914 Kotze's confidence that management

would honour such a policy had waned;¹⁷⁷ he, like miners, concerned politicians and doctors, was obliged to concede that surprise visits by the inspectors to the mines was the only strategy which would achieve managerial compliance with the law.¹⁷⁸ This was the result of his discovery, to his "disagreeable surprise", that remedial measures "carried out in an excellent manner" on "some mines" were the result only of "pressure from the Department".¹⁷⁹ Unlike in Britain, where management "did their own police work" and anticipated inspectors' visits once in two years,¹⁸⁰ many managers on the Witwatersrand required constant policing. Clearly between 1907 and 1910 - and until much later - for many mine managers the "spirit" of the regulations was a meaningless concept to which they paid mere lip service.

From the earliest introduction of water appliances on the Witwatersrand the rock drillers resisted using them. The miners did not object to the use of water itself. Rather, they opposed the conditions under which the mineowners compelled them to work with it.¹⁸¹ But management ignored the grievances of the miners, many of which, as we shall show later, were legitimate. Also, the mineowners made no effort to elicit the co-operation of miners in using the water devices. Throughout the period 1902 to 1914 the Randlords refused adamantly both to recognise and to negotiate with the Transvaal Miners' Association.¹⁸² Consequently they did not establish

communicative channels to alert miners to the necessity for using water to prevent the occurrence of silicosis. Nor did they introduce instruction programmes to train miners to use the water appliances efficiently. Instead, they delegated the education of the miners concerning the safeguard of their health to the individual mine managers, most of whom abrogated the responsibility.

Richard Barry, the manager of the Nourse, was one of the few mine managers who committed himself to reducing the incidence of silicosis on his mine.¹⁸³ In 1911 he regretted both the present and the past oversights of his colleagues:

People have been slow to realise what ravages this disease has made and is making, and even today the efforts to eradicate it on a great many mines are of the very flimsiest nature.

We cannot entirely absolve the Miner from blame, but we who are supposed to know better, should have started upon a serious campaign of education on practical lines long since.

I hope, myself, to see both owners and miners made to feel a personal interest in eradicating the disease as far as possible.¹⁸⁴

Barry's sentiments echoed those of A. McArthur Johnston, who in 1906 had also advocated that management educate miners to the risks of their calling:

We must also make the case clear to the miner, himself, and show him that his co-operation is absolutely essential and worthy of every attention.¹⁸⁵

But in 1906 Johnston's enlightened plea fell on deaf ears.

The disregard by contemporary mining authorities for the co-operation of the miners explains why the Chamber's competition, well-intentioned as it undoubtedly was, proved to be a fiasco in the long term. With 229 entries, the competition was well patronised, but the judges awarded only two of the three prizes. The decisions of the judges both contradicted their report and the conditions for the prizes. In terms of the competition rules the prize-winning dust preventatives had to be both practically efficient and economic. The first prize was awarded to the atomiser, patented by the manager of the Wolhuter, T. H. Britten. Although the judges claimed it to be the most efficient dust allayer, both the sprays and the jets, which the judges rejected, also only allayed 75 per cent of the dust. Likewise, the award of the second prize to the Leyner Drill was illogical, as the judges declared it be impractical.¹⁸⁶ Clearly economic priorities were the sole criteria which determined the judges' adjudication.

More important, the judges ignored completely the concluding injunction of the Weldon Commission that management choose water devices "which would cause least discomfort to the miner".¹⁸⁷ Apart from securing the endorsement of the mineowners' newspapers, the *Star* and the *Transvaal Leader*, and a handful of

compliant rock drillers,¹⁸⁸ the judges did not consult the official representatives of the miners.¹⁸⁹ Discussions with the Transvaal Miners' Association would have shown the judges that the Britten atomiser was the most unpopular water device on the market.¹⁹⁰

The award of the first prize to the Britten atomiser had disastrous consequences: the miners' opposition to the atomiser rendered useless management's first puny attempts, from 1902 to 1910, to control the incidence of silicosis. Although Cornish mining experts considered the atomiser to be so unsuitable and ineffective as not even to warrant a trial,¹⁹¹ when the 1906 Transvaal regulations made the use of water with rock drills compulsory, most mineowners provided miners with the atomiser.¹⁹² Consequently most of the miners' resistance to using water stemmed from managerial compulsion on them to use a device which they considered to be inefficient, ineffective and a major source of additional illness.

Although management asserted that the miners' objections had little, if any, substance,¹⁹³ later objective tests with the atomiser and the spray, a device similar to the atomiser, proved that the miners' judgements, based on their own experience, were valid. By 1911 the atomiser and the spray, much vaunted by management in the pre-Union years, had been relegated to the "scrap heap". After 1910 the volte face by management in denouncing these appliances as "silly", "childish" and "useless" was truly ironic.¹⁹⁴

Likewise, in the case of respirators, management on the Witwatersrand gave no credit to the miners' practical experience, when the miners discarded such dust-control equipment, which they derisively called "nosebags".¹⁹⁵ Mine officials and health officers were well aware, as both the Weldon and the Haldane Commissions had found, that respirators were highly inefficient dust preventives.¹⁹⁶ Even so, they urged the miners to use the device and accused the miners of being lazy and neglectful of their health when they resisted wearing the equipment.¹⁹⁷ Rock drillers had major reservations concerning the respirator, which covered both nose and mouth, not the least being their objection that the device, when used in poorly ventilated "dead ends", generated intolerable heat and depleted further the miners' limited supply of air.¹⁹⁸ But management insisted that the respirator was beneficial asserting that all the "inconveniences" which the respirator caused the miner were of "slight" consequence.¹⁹⁹

More important, the miners found the respirator to be an ineffectual dust preventative. With sound logic Mathews reasoned to various mining commissions:

I have used a respirator two or three times, and I have always found on the inside of a respirator a fine deposit of dust...The inference is that, if on the inside of a respirator, on the sponge of a respirator there is a deposit of fine silicious [sic] dust, then a lot of dust has gone down the throat of a person who is wearing it.²⁰⁰

The scientific experiments of the Miners' Phthisis Prevention Committee confirmed much later, in 1913, the contention of the miners, based on their experience, "that all the respirators failed to catch the dust, and some passed 100% of it".²⁰¹ The practical experience of miners, which management ignored, was often a sounder determinant of dust-precaution efficacy than managerial theory. This was certainly so with respect to both respirators and water devices, including portable atomisers and sprays.

In 1902, when the Chamber inaugurated the competition for the best dust-prevention device and during the subsequent trials, on the Witwatersrand there were two major categories of water appliances, which could be used in conjunction with rock drilling. The first category comprised drills which had an automatic water feed. They were similar to the predominant drill of this type, the "Water Leyner Rock Drill".²⁰² An American manufacturer developed the Leyner Drill and a number of British and European firms copied its principle.²⁰³ The Leyner Drill had a hollow steel borer through which water was delivered directly into the hole at the rock face by the machine's percussive, or hammer-like, mechanism: the delivery of water and the drilling took place simultaneously.

This form of water device was the most popular one amongst the miners.²⁰⁴ Pressure from the compressor, which activated the drill, at the same time delivered a constant stream of water through its hollow centre, so keeping the hole wet and preventing the dust from escaping.²⁰⁵ Also, it created minimal atmospheric dampness.²⁰⁶ Rock drillers found it to be both convenient to use and efficient as a dust-allayer.²⁰⁷

But the Leyner Drill was a relatively expensive appliance. Because of its hollow-steel centre, its capital costs were higher than those of the conventional reciprocating machines.²⁰⁸ Also, the maintenance costs of the Leyner Drill were high. A high pressure was required to operate the machine;²⁰⁹ the drills were difficult to dress; and, as the manufacture of tempered hollow steel had not yet been perfected,²¹⁰ the drill was subject to constant wear and tear.²¹¹ In brief, the working costs of a Leyner Drill were 2s 6d more per foot than those of reciprocating drills.²¹²

Most mining houses agreed that the principle of the Leyner Drill was "ideal". But they also claimed that the machine was "not sufficiently perfected" to warrant its general use.²¹³ Although it was the most effective available appliance for laying dust, the mineowners rejected it because it was uneconomic,²¹⁴ a reason which Macaulay and Irvine and other doctors

endorsed.²¹⁵

In 1912 the mineowners introduced Leyner-type rock drills on many mines.²¹⁶ Admittedly, the technology for the manufacture of hollow steel had improved considerably by 1908.²¹⁷ Even so, as in 1902, in 1912 the Leyner Drill still had high maintenance and capital costs.²¹⁸ But in 1912, as a result of government and public pressure, the Randlords were obliged to subordinate costs to the more important goal of eliminating dust from the mines.²¹⁹

The second category of water appliances consisted of devices which, unlike the Leyner Drill, were not built into the machine: they were separate appliances which were attached to the rock drills. Although the miners often referred to them collectively as "sprays",²²⁰ there were three distinct devices: the jet, the spray and the atomiser.

The jet, as its name suggests, was a stream of water directed into the hole by a hose attached to the water supply.²²¹ While the hole was being collared, the jet of water effectively allayed the dust. But the continuous stream of water in the hole caused the dust to clog: the drill would jam before the hole had been completed.²²² Consequently the jet was not entirely efficient.

The inefficiency of the jet was not the reason that management rejected it. Rather, management's major objection to the jet stemmed from its capital

and maintenance costs.²²³ The jet could operate only under a "head of water", or pressure. Its use therefore necessitated management installing pipes, which radiated from the main pipe, "all over the mine".²²⁴ Apart from the capital costs necessary for its installation, the running costs of the jet were higher than those of the spray and the atomiser. The force with which the jet operated required both a strong source of power and an ample supply of water. In this context it must be noted that water was a scarce and expensive commodity on the Witwatersrand.²²⁵ The "purchase price" of water from the Rand Water Board was "so great" that E. Ross Browne, the overseas consultant for the Corner House, recommended that the mines "should repump and use it [water] over and over".²²⁶ Finally, unlike a spray and an atomiser, both of which the rock driller could handle on his own without assistance, two operators were needed to handle the jet. While the one miner worked the drill, the second had to direct the jet and to keep the hose "truly parallel with the boring tool".²²⁷

In the view of rock drillers, particularly of those working under contract, the major disadvantage of the jet was the delay it caused. As we have seen, it tended to jam the drill. Also, it took time to adjust; and its operation slowed down the pace of drilling.²²⁸ Even so, for a number of reasons machine drillers preferred the jet to the spray and to the

atomiser.

When accustomed to operating the jet the rock driller, by releasing it from the hole after collaring, prevented the drill from jamming. He then applied the water around the orifice and not into it.²²⁹ The miners claimed that the jet was a more efficient dust-allayer than either the spray or the atomiser.²³⁰ But the miners' judgement, based on their experience, may not have been entirely correct. The judges in the Chamber's competition reported that all three appliances laid approximately 75 per cent of the dust.²³¹ Even so, the rock drillers found the jet to be a more convenient, a more comfortable and a healthier device than either the spray or the atomiser.²³² The jet undoubtedly released moisture, in the form of steam, into the atmosphere.²³³ But the steam did not "drench" the miner "to the skin", as did the super-saturated mist created by the spray and the atomiser.²³⁴

Although the jet had deficiencies, in terms of the limitations of contemporary technology it met many of the requirements of a suitable dust allayer: it had "simplicity, cheapness and practicability".²³⁵ Despite its general adoption in 1904 by the industrialists in Cornwall,²³⁶ following its rejection by the judges in the Chamber's competition few Transvaal mine managers used it. Even after Waldon in 1906 apprised the Randlords of the miners' desire to use the device, most mineowners refused to provide the miners with the

jet.²³⁷ Undoubtedly the cost of pipes, water and power prompted the mineowners' opposition to the jet:²³⁸ portable sprays and atomisers had far lower capital and running costs than jets.

Like the jet, the spray had a hose to which a nozzle was attached. Most sprays used on the Witwatersrand operated on principles similar to those of the Climax Dust Allayer, patented by the Cornish firm, R. Stephen and Son. Influenced by management's claims that it was both cheap and easy to operate, in an article submitted to a local mining journal, Dr Norman Fern enthusiastically described its features:

The appliance is fixed on to the air-tap of the rock-drill, and the same air that operates the drill works the dust allayer. The water is drawn from a bucket of water on the ground or in difficult positions when "raising", from a bag on a Kaffir's back, up to a hose to the attachment on the air-tap and is then forced out through a nozzle by the compressed air in the form of a spray which plays directly on to the hole being drilled, the dust as it flies out of the hole simply falling as mud. The amount of water used can be easily regulated from one gallon in five minutes to one gallon in eighty minutes, and the direction of the spray can be altered at will to any required radius within three feet.²³⁹

The atomiser, which worked on the same principle as the spray, had a nozzle with much smaller holes, so causing it to create a mist rather than a spray. Its proponents asserted that the water was so finely atomised that it rendered the "particles of dust too heavy to float in the workings".²⁴⁰ As we have seen, according to the claims of the Chamber's competition judges the atomiser, like the spray and the jet, rid

the air of 75 per cent of the dust.²⁴¹

In evidence to the Weldon Commission, Joseph Fisher, an inspector of mines, defined both the inefficiency and unpleasantness of operating portable sprays and atomisers and urged that management install water service pipes to promote the miners' co-operation.²⁴² But for reasons of cost, the Randlords ignored Fisher's plea. Instead, they supplied the miners with portable appliances, similar to the one described by Pern. It is therefore not surprising that the miners opposed the portable devices. As Fisher anticipated, from 1902 to 1910 the rock drillers, who were obliged to use sprays and atomisers, experienced difficulties and inconveniences and were subjected to singularly unhealthy working conditions.

The portability of the sprays and the atomisers was not an advantage for miners, as Pern believed, but a major inconvenience.²⁴³ In 1912 C. J. N. Jourdan, an inspector of mines who had formerly been a miner, explained:

Unless a good water system is installed the miner cannot be blamed for neglecting to use water. To carry water to his stopes, or working place, from a distance, or to wait for the water to be delivered to him from some of the small mains in existence, which would possibly, if other stopes were drawing from them at the same time, deliver him about a bucket full of water in an hour, would take a lot of time, and he would not be encouraged to do so by his overseers, who are hustling to get the ore broken and sent to the surface as quickly as possible.²⁴⁴

Because most mineowners refused to install water service pipes, the miners had literally to scavenge for water. On the Robinson Deep, for instance, "the men had to go the length of the level, about 3,000 feet scoured by the water lying on the track". In 1907 Thomas Willis asked the Mining Industry Commission with rightful indignation: "Would you consider that [water, on the Robinson Deep,] fit to use [for spraying] in any stopes?"²⁴⁵ Clearly a major objection that the miners had to using the sprays was the quality of the "putrifying [sic] water". Virtually the only available water was "any dirty water taken out of any hole".²⁴⁶ In 1907 Thomas Mathews, the organiser of the Transvaal Miners' Association, rejected management's suggestion that repumped water, which management claimed would not "stink", should be made available for spraying:

If you have a spray in the drive and there is any bacteria in it you inhale it and get typhoid. There is no water on the Rand that we ought to inhale unless it is absolutely pure. I have been in ends where they have had a spray and the water was taken out of the tank where droppings had gone in. It is damnable at times and therefore we do not use the spray.²⁴⁷

When water pipes were installed, so providing the dust allayers with a "head of water", the rock drillers experienced minimal dampness: the water issued "without noise or fog".²⁴⁸ But in the case of portable sprays and atomisers, the compressed air, which activated the water, caused the atmosphere to be super-saturated: the miners worked literally in a bank

of fog.²⁴⁹ Consequently another reason that the miners refused to use the sprays was their vulnerability to contracting pneumonia.²⁵⁰ In its 1906 petition to the British Prime Minister, Henry Campbell-Bannerman, the Transvaal Miners' Association claimed that rock drillers were confronted with a choice of "two evils". Either they could suffer the old conditions with the "dread" of silicosis, or they could adopt precautions which would "sooner or later ensure pneumonia". In brief, the miners asserted that the "remedy was worse than the disease itself";²⁵¹ "they would rather die of miners' phthisis than pneumonia".²⁵²

The decision by the Transvaal Miners' Association to by-pass Weldon and to refer their grievances directly to Campbell-Bannerman wounded the pride of the Acting Commissioner of Mines. At a meeting with the union officials he showed his resentment by his total lack of sympathy with their complaints. He declared insensitively that the miners' vulnerability to "chills and rheumatism" was the result of their failure to use the change houses. Likewise, the mining houses treated the miners' complaint that the atomisers and sprays caused them to be prone to contracting pneumonia with scepticism: they wanted statistical and scientific proof that the damp underground atmosphere created by portable sprays and atomisers was "injurious to health".²⁵³ George Webber, the general manager of Rand Mines, was openly

contemptuous of mine managers who shared the miners' concern with this problem. Arrogantly he declared:

Personally I believe much benefit would be derived if the use of dust allaying devices were made more compulsory, as, although the air may be moistened to some extent, I have never heard of any serious illness arising from this cause at any of the mines where the atomiser has been in use.²⁵⁴

In brief, the mineowners rejected all the miners' objections to the sprays as having little, if any, validity. They regarded miners' legitimate complaints as excuses for their laziness, conservatism and disregard for health. Also, in 1906 the Randlords gave no credence to the views of the few mine officials who asserted,²⁵⁵ like M. H. Coombe, that the miners' views were, indeed, correct. Coombe stated categorically:

I infinitely prefer the water jet. Atomisers and sprays create a humid atmosphere, make the place very uncomfortable for working in, and drench every one to the skin - that is, in the immediate neighbourhood - and as the water used is in most cases polluted mine water, it must necessarily carry and distribute germs with it. Were I a machine man I would quit any mine where I was coerced into the use of either a spray or an atomiser.²⁵⁶

One element was common to all the miner's complaints about the use of water: the mineowners' refusal to install water service pipes.²⁵⁷ Mining experts, in both private and government service, who were committed to eliminating silicosis, agreed that the installation of water pipes was essential.²⁵⁸ The Mining Regulations Commission, as we have seen, recognised, too, that such a water service was a

matter of urgency. In 1908 this recommendation was the substance of its directive to de Villiers; within a month this "boom of laying on of water", as an inspector called it, was made compulsory by regulation.²⁵⁹

In 1903, when discussing the devices entered for the Chamber's competition, James Moir, the chemist to the Mines Department, was sanguine about its outcome. He declared optimistically:

I do not think there is any great difficulty in this, except in the matter of expense, and I think the mining companies will gladly find the money for any scheme that has a chance of being successful in preventing miner's phthisis.²⁶⁰

But Moir, as we have noted,²⁶¹ became rapidly disillusioned by the mineowners' cheese-paring financial policy regarding ventilation. The same parsimony characterised the Randlords' first puny attempts to allay dust with water. Water devices could operate successfully only with water service pipes, as the Cornish industrialists had shown. But in 1907 when C. J. N. Jourdan, a miner who was later promoted to being an inspector, submitted a scheme to his employers for working with water under pressure, "it was laughed at and passed over for the alleged reason that it was not practical, and would cost too much to instal [sic]".²⁶² As an inspector noted in 1909, the mineowners put in a water service to the faces, "only after the laying on of a continuous supply became compulsory by regulation".²⁶³

In installing water systems, until 1914 most mineowners complied solely with the bare letter of the law. Only in 1915 was Barry heartened by the improvements in this regard: "We now see great reforms...wrenched from the industry by brute force".²⁶⁴ Clearly from 1902 to 1910 the use of water on the Witwatersrand mines achieved minimal results in allaying dust. This form of prevention did not in any way help diminish the prevalence of and mortality from silicosis.

Dust created in blasting was as injurious, if not more so, than dust generated in rock drilling. As we have seen, the 1906 Transvaal dust precaution regulations made provision for the prevention of dust during blasting. Throughout the period, however, management and the state focused almost entirely on dust prevention in rock drilling. Between 1906 and 1910, when miners and management were prosecuted for infringements of the dust precaution regulations, all the cases, few as they were, involved the supply of water to rock drills.²⁶⁵ Indeed, during the same period the regulations for the control of dust during blasting were completely ignored.

Admittedly, management favoured the use of sprays after blasting. In awarding the Chamber's competition prize to the atomiser, the judges commended the appliance for the ease with which it could be detached from the drill and left at the face to allay the dust after blasting.²⁶⁶ But both the portable atomiser and

the portable spray were even less efficient in controlling dust after blasting than they were in allaying the dust during rock drilling.

The Haldane Commission paid a great deal of attention to dust control in blasting and recommended strongly the use of the James Water Blast.²⁶⁷ In inventing the device, William James, an underground agent at the Dolcoath Mine in Cornwall, followed the principles of water blasts used successfully, during the 1890s, to allay dust in the construction of the Simplon Tunnel.²⁶⁸ But initially the mining authorities on the Rand had scant respect for the findings of the British commission. After admonishing Haldane for making generalisations "from his own case, namely the 'state of affairs existing in Cornwall'", they argued arrogantly that the Witwatersrand mines were unique and required their own distinctive treatment.²⁶⁹

In 1906 the paper delivered by Irvine and Macaulay to the Chemical Society both revitalised the organisation's concern with the problem of silicosis and promoted respect for the Haldane Commission's findings. The members of the society agreed with the two doctors that all mines should use the James Water Blast.²⁷⁰ Even so, at the time few mineowners, because of costs, installed the device voluntarily.²⁷¹ The water blast consumed much water and power and required service pipes.²⁷² The mineowners followed the advice of experts only in 1911 when mining regulations made

the use of the water blast compulsory.²⁷³

The 1906 dust precaution regulations also prescribed that miners be prohibited from re-entering blasting zones until the smoke and fumes had dissipated: a lapse of at least half-an-hour was required.²⁷⁴ Between the ten-hour shifts, however, there was insufficient time for this precaution to be effective. The development faces were relatively free of dust and smoke only after the week-end, on Monday mornings.²⁷⁵ The only solution to such a problem was the introduction of the single shift. The single shift was a system of blasting which took place only once during the day, at the end of the second shift.

In 1906 and 1907 the Consolidated Goldfields introduced two measures to improve the ventilation of its holdings, which included the East Rand Proprietary Mines. With shifts shortened to eight hours and with the single-shift system, these mines provided a seven-hour lapse after blasting, which was considerably longer than at other mines.²⁷⁶ When a director of the East Rand Proprietary Mines suggested to Lionel Phillips that the Corner House introduce the same system, Phillips adamantly refused to do so. He claimed that such a "sad mistake" would both slow down production and would lead to "more costly DEVELOPMENT". His refusal pin-pointed a major weakness in his group's mining policy: too little development was done before the mines began to produce. In brief, because of inadequate prior development most Corner

House mines, and those of most other mining houses, had too few stopes. Consequently, with the exception of Consolidated Goldfields, before 1910 the Corner House and the rest of the groups refused to introduce the single shift because it would reduce profits.²⁷⁷

In 1913 thirty-two of the sixty-two mines in the Witwatersrand district worked according to the single shift.²⁷⁸ It was at this time that Richard Barry embarked on his frustrating path of trying to persuade all the groups to introduce the single-shift system, which the 1913 Economic Commission also recommended.²⁷⁹ In this crusade Barry, as a member of the Miners' Phthisis Prevention Committee, encountered both "personal abuse" and considerable opposition from mining engineers associated both with his own group and with other mining houses.²⁸⁰ Although both the Miners' Phthisis Prevention Committee and the Chamber eventually approved the principle of single-shift blasting,²⁸¹ some mines ignored the Chamber's directive.²⁸² In the battle against silicosis such failure by certain mineowners to observe the spirit of the regulations presented the Department of Mines with only one alternative - compulsion by regulation in 1917.²⁸³

From 1902 to 1910 the refusal by most mineowners to introduce single-shift blasting was a strong indication to miners that the profits of the industry had priority over ventilation and their health.²⁸⁴ Although the Witwatersrand miners considered that dust

played an "important part" in the incidence of silicosis, they believed that the "bad ventilation and fumes from the gelatine" was the "primary cause" of the disease and their high mortality.²⁸⁵ In support of this view they cited the case of the British coal mines, in which improved ventilation during the 19th century had succeeded in reducing dramatically the mortality amongst colliers from lung disease.²⁸⁶ The controversy amongst the members of the Chemical Society concerning the causative role of nitrous fumes in silicosis added substance to the miners' claim. In 1906 the deep concern of the Transvaal Miners' Association prompted a letter to Sir Henry Campbell-Bannerman. As we have seen, the union's letter condemned the enforced use of sprays because they caused pneumonia. In their letter to the British Prime Minister the miners also criticised the government's failure to enforce the ventilation regulations, so promoting the mortality amongst miners.²⁸⁷

Selborne, the Governor of the Transvaal, authorised Weldon to investigate the miners' allegations. With reference to ventilation, Weldon reported to Selborne that the miners "had little real ground for complaint".²⁸⁸ But he knew this to be untrue. Weldon confided to the Chamber that "District Inspectors of Mines" had advised him that the miners' allegations had "foundation" with respect to "the deeper mines".²⁸⁹

Also, at the meeting with the miners' union Weldon inadvertently let slip that he was unable to enforce the ventilation regulations.²⁹⁰ But Weldon did not tell the delegation that, on the request of the Chamber, the regulation stipulating that each worker receive seventy cubic feet of air per minute had been suspended since 1903.²⁹¹ Weldon was awaiting the decision of a committee, appointed in 1903, comprising members of the Chamber and the Department of Mines, as to whether the air in the underground workings should be measured and tested according to quality or quantity standards.²⁹² The co-ordinating committee, however, procrastinated about making a decision, because the Chamber objected to the height of the quality standard suggested by the chemist to the Mines Department, James Moir.²⁹³ For these two reasons, namely the continued suspension of the ventilation regulations and the inability of the co-ordinating committee to reach consensus on a ventilation standard, in 1905 the Chemical Society urged the Transvaal administration to appoint an official commission to investigate and to make recommendations concerning the problem.²⁹⁴ But the British administration did nothing further. Only in 1907 did Het Volk's cabinet led by Botha and Smuts appoint the Mining Regulations Commission to decide the ventilation issue.²⁹⁵

In 1906 there was clearly strong substance to the miners' contention that management "insisted" on their

working in "foul dead-ends" without ventilation.²⁹⁶ The circulation of compressed air in the winzes and drives was insufficient to protect them from the lethal dust and the deadly nitrous fumes.

As important, the failure of management and the Department of Mines to observe virtually any standards of ventilation encouraged miners, as they had done in the pre-war years, to risk their health by blasting promiscuously. From 1902 to 1914 many miners, during the shift and amidst the fumes and the dust, returned voluntarily to the face to re-blast. In public management tended to gloss over the problem of in-shift blasting.²⁹⁷ The reason was that many mine managers and other mine officials colluded with the miners regarding the practice. As we have seen, many mine managers overlooked the rock drillers' refusal to use the sprays and atomisers. Likewise, most mine managers cast a blind eye to miners blasting the "cut" and the "round" in the same shift. Indeed, many mine officials, eager to achieve development records, "clapped their hands" when miners flouted the dust precaution regulations by blasting promiscuously.²⁹⁸

But miners did not always practise in-shift blasting of their own accord. On some mines, management, anxious to sustain output, put pressure on rock drillers to break the dust precaution regulations. According to Mathew Trewick, an officer of the Transvaal Miners' Association who opposed the practice of promiscuous blasting, such managerial

compulsion was frequent:

Yes, [double blasting is very deleterious]. You may get through, but there is too much rushing put upon you. We have cases where men have been compelled to blast out the face every shift...In some mines, if a man came up he was compelled to go back and finish, and his circumstances compelled him to go. That place had to be blasted out every twenty-four hours...We have heard of men doing eighteen hours underground. I had a man speaking to me, and he told me the time he had been working. I think he said fourteen or sixteen hours, taking all the month.²⁹⁹

The miners were in a difficult position if they objected to management's irregularities concerning the regulations, because they ran the strong risk of being victimised if they reported such incidents. A miner's personal complaints to mine officials, regarding lack of water, promiscuous blasting and poor ventilation invariably resulted in his dismissal on a pretext unconnected with his complaint.³⁰⁰ He then had difficulty in finding another job because the Association of Mine Managers, with the sanction of mining directors,³⁰¹ circulated both official and unofficial blacklists of miners who "spoke their mind".³⁰²

It was equally difficult for the miner to make complaints to inspectors when they visited the mines, because he could not do so privately, but only in the presence of a mine official or the mine manager.³⁰³ Also, there were two reasons that anonymous complaints were valueless. First, the Department of Mines did not take them seriously: Weldon claimed that such

"statements lacked foundation".³⁰⁴ Second, on the rare occasions when inspectors investigated miners' allegations, suspicion invariably fell on the complainant who was later dismissed "on some other charge".³⁰⁵ In evidence to the 1912 Parliamentary Select Committee on Miners Phthisis, Kotze corroborated the miners' allegations that they were victimised for this kind of conduct:

The ordinary miner is always in a position of knowing that if anything goes wrong and he complains, he may be sacked, so that he is between the devil and the deep sea, as it were. He runs the risk of either being fined by the inspector or of getting the sack for complaining.³⁰⁶

During the period 1902 to 1910 there was much substance to the miners' claim they they were being "coerced into being apathetic".³⁰⁷ As Mathew Trewick explained to the Mining Regulations Commission in 1907, when management compelled the miners to comply with its demands in defiance of the mining regulations, they had no option but to remain silent:

You don't get much encouragement for reporting or suggesting things on these mines. I have found myself that it is the safest plan if I want to keep my job to do my work, and know nothing about anything else that may go on. If you want to keep your job you don't want to go reporting things.³⁰⁸

The miners' need "to sing dumb" partly explains why in March 1906 the Transvaal Miners' Association by-passed local government officials and lodged their complaints with the British Prime Minister.³⁰⁹ Also, the union insisted on meeting Weldon *in camera* when he

investigated their petition to Campbell-Bannerman. The union was not as yet in a sufficiently strong financial position to fund salaried officials who could speak independently on behalf of the union members.³¹⁰ The fear of victimisation also inhibited miners from exposing the ravages of silicosis to the press. From the end of 1906, when it could afford to employ both a salaried secretary and paid organisers,³¹¹ the Transvaal Miners' Association openly criticised the industry in giving evidence to government commissions.

Even so, without the recognition of the Chamber, the Transvaal Miners' Association had no bargaining power whatsoever with individual mine managers who compelled the miners to break the dust precaution regulations. As we have seen, most mineowners were loath to install water services. Consequently from 1908, when the rock driller was prosecuted for not using water, he paid his fine and said nothing: "it would mean the sack if he reported the true facts of the case".³¹² Likewise, rock drillers, who were unwilling to blast promiscuously, simply complied with management's directives to do so.³¹³

In Barry's view, the prohibition of promiscuous blasting was an essential dust prevention measure.³¹⁴ In 1913 a regulation made in-shift blasting illegal. But an additional clause, requested by the Chamber,³¹⁵ permitted mine managers to grant rock drillers exemptions from the regulation "where necessary".³¹⁶

Despite their commitment through their Association to eliminate silicosis, many mine managers were clearly ambivalent about allowing promiscuous blasting.³¹⁷ In-shift blasting helped speed up development, so promoting production.³¹⁸ The mine managers' conflicting interests were encouraged partly by the reluctance of many consulting engineers, who were the mine managers' immediate superiors in the mining hierarchy, to disallow in-shift blasting entirely.³¹⁹ It is therefore not surprising that, despite constant injunctions from the Miners' Phthisis Prevention Committee for the total abolition of promiscuous blasting, management permitted the pernicious practice to continue.³²⁰ Only in 1919 did legislation prohibit entirely blasting the "cut" and the "round" in the same shift.³²¹

Mine managers, as we have seen, bore the onus for the observance of the dust precaution regulations. But many of these officials were only in a small way liable for the continued prevalence of high dust densities. Although the mine managers were the immediate custodians of the mines, they were merely the instruments of the mineowners' policies. During the period 1902 to 1910 the designs of the Randlords made it impossible for even the most dedicated of these mine officials to do little more than observe the bare letter of the regulations.

After 1901 it was only natural that the mineowners should want to increase production to make

good the losses sustained during the war. But their ambitions did not stop at this. Indeed, they went far further. The Randlords were now determined to implement their plans "to get every ounce of gold which is in the ground out of it".³²² Ambitiously, if not recklessly, they turned to mining low grade ore reserves, which for reasons of cost, they had refrained from mining during the pre-war years.³²³ Before the war the mineowners had not mined ore which had an assay value of "under eight dwts per ton".³²⁴ But after the war they began to mine reefs which had an assay value of only four dwts per ton.³²⁵ In 1899 the average grade of ore being mined was 10,091 dwts per ton milled. In 1903 the average grade dropped to 8,483 dwts per ton and by 1910 it fell to 6,752 dwts per ton.³²⁶

The successful implementation of such grandiose plans necessitated substantial reductions in working costs. The problem was compounded by the world-wide cycle of increases in commodity prices,³²⁷ which caused the purchasing power of gold, which remained fixed, to fall. Even so, the Randlords succeeded in reducing the cost per ton by 2s 6d. Before the war the cost per ton averaged approximately £1 3s 7d, whereas by 1906 it had fallen to approximately £1 1s 1d.³²⁸ Most of the cost reductions - 2s per ton - were achieved on the surface.³²⁹ By 1907, according to the mineowners, surface working costs had been pared to the bare minimum and were capable of no

further adjustment.³³⁰ But they viewed underground costs, which they had been able to decrease by only 6d per ton, as having the potential for considerable further reductions. In this respect, as we shall see later, both the reduced wages of white miners and their increased productivity became the mineowners' main targets.

Accelerated production was the means by which the mineowners achieved their success in reducing underground working costs per ton by 6d and simultaneously mining low grade ores at a profit. The "speeding up" of production, which had characterised the mineowners' policy during the pre-war years, was far more pronounced in the years which followed the Anglo-Boer War. "Tonnage" was the "primary requirement" of the mineowners,³³¹ a directive with which mine managers were obliged to comply, or lose their jobs. The mines were over-stamped and to keep them going at full capacity strained every resource of the mine manager, as M. H. Coombe, manager of the State Mine, explained to the Chemical Society:

Speeding up in some of our mines is an admitted practice...The fault here does not lie so much with the management as with the policy that erects big mills and drops the stamps before sufficient development has been achieved to keep the mines ahead of the mill. Every ounce of rock is wanted, waste as well as reef. Pillars can be ill spared. Timber is expensive, and the underground boss at his wit's end to do forty things at once, chances himself and his mine to luck and hopes to get ahead of the mill or die.

This, of course, is not mining. In fact, mining is becoming a lost art on the Rand.

It is simply "gouging" out everything to feed a monster that is not and cannot be satisfied.³³²

Clearly "cost per ton" was the "standard" by which everything was measured by management on each and every mine.³³³ It is therefore highly likely that management's subscription to such a policy during the post-war period resulted in accelerated mining methods which were responsible for creating dust levels which were as great, if not greater, than those generated by mining practices before the war. Such a policy, too, was a major obstruction to implementing dust precaution measures. C. J. N. Jourdan, an inspector of mines, whose scheme for the improved use of water had been rejected in 1907, was convinced that during the period 1902 to 1910 the mineowners overlooked almost completely the improved health of their workforce. In 1911 Jourdan observed pointedly that before Union the overriding concern of the mineowners had been to reduce working costs:

No matter what the suggestion was for making improvements underground, one was met by the question, "Did it increase the cost per ton hoisted to the surface?"³³⁴

Indeed, from 1902 to 1910 the industry's policy of "speeding up" helped increase both the profits of the mineowners and the death rate from silicosis amongst the miners.

In 1912 John X. Merriman, the former Prime Minister of the Cape Colony, was a member of the first parliamentary select committee on silicosis. The objective of the committee was to review the draft

legislation concerning the award of compensation to miners who had contracted the disease.³³⁵ Merriman, however, believed that the award of compensation, although necessary, was merely a palliative. His conviction that the elimination of the disease was far more important than the award of compensation prompted him to express this view in a personal memorandum which he attached to the select committee report.

In his memorandum Merriman reviewed the laxness during the period 1903 to 1910 of the miners, government and the mineowners in observing remedial measures to prevent silicosis. Following the conventional wisdom, Merriman blamed the miners for their "negligence" in not observing the dust precaution measures. Also, he criticised the government for failing to enforce the regulations with any "vigour". For emphasis, however, he reserved his final and weightiest censure for the Randlords:

The mine owners, with few exceptions, waited for the Government to prescribe remedies and enforce the Regulations, but there is no doubt that in many mines considerable slackness prevailed in carrying out such Regulations. "Speeding up" was the rule and observance of the ordinary precautions set forth in the report of 1903, at which date both the cause of the disease and the remedies were perfectly well-known, was the exception.³³⁶

Notes

- 1 Pratt, p. 174.
- 2 *Rand Daily Mail*, 7 May 1913, letter by an anonymous miner.
- 3 SC 10, 1912, p. viii, Appendix C.
- 4 *Report of the Miners' Phthisis Commission, 1902-1903*, p. xxi, pars. 71, 72.
- 5 *Final Report of the Mining Regulations Commission, 1910*, v. 1, p. 241.
- 6 *Transvaal Leader*, 28 Aug. 1909, "Capital and Labour".
- 7 *Evening Chronicle*, 13 Aug. 1913, "The Miners' Enemies". In private correspondence John X. Merriman also referred to the "callous indifference on the part of the Owners". See A. H. Marais, p. 70, JXM to M. T. Steyn, 12 May 1912.
- 8 *South African Mines, Commerce and Industries*, 7 April 1906, p. 73, "Better Conditions for Rand Miners".
- 9 *Report of the Miners' Phthisis Commission, 1902-1903*, pp. 22-23, qq. 112-113, questions asked by R. M. Catlin; JCMMS, April 1903, "Miner's [sic] Phthisis" Some Notes and Suggestions", p. 235, discussant A. Heymann; *South African Mines, Commerce and Industries*, Sept. 1903, p. 543, "The Doctors and Silicosis".
- 10 Oliver, *Diseases of Occupation*, p. 293.
- 11 *Report of the Miners' Phthisis Commission, 1902-1903*, pp. 22-23, qq. 112-113, evidence of Dr D. Macaulay; JCMMS, Sept. 1903, "Some Mine Gases: Their Toxicology and Possible Connection with Miners' Phthisis", p. 49, discussant Dr W. C. C. Pakes.
- 12 *Report of the Miners' Phthisis Commission, 1902-1903*, pp. x-xii, pars. 16-32.
- 13 *Transvaal Leader*, 29 Aug. 1910, "Ventilation and Phthisis".
- 14 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 25, q. 154, question put by F. Drake.
- 15 *Report of the Miners' Phthisis Commission,*

1902-1903, pp. ix, 21, 25, par. 13, qq. 93, 154-156, evidence of Dr L. G. Irvine and Dr W. G. Rogers.

16 *South African Mines, Commerce and Industries*, 1 Aug. 1903, p. 449, "Leading Article".

17 Payne et al, p. 9.

18 *West Briton*, 18 July 1907, "Employers and Miners in the Transvaal"; *JCMMS*, April 1903, "Miner's [sic] Phthisis: Some Notes and Suggestions", p. 258, discussant J. A. Wilkinson. See also *ibid.*, p. 234, discussant A. Heymann; Cullen, p. 237; *Cornubian*, 29 May 1903, "Notes and Comments"; and *South African Mines, Commerce and Industries*, 1 Aug. 1903, p. 449, "Leading Article".

19 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 242, evidence of Dr L. G. Irvine.

20 *UG* 19, 1912, p. 13, par. 32.

21 *Report of the Miners' Phthisis Commission*, 1902-1903, p. vii, par. 5.

22 Cf. Grey, p. 302, who excuses the poor response of the mine managers by stating that they were unaware of the importance of the investigations.

23 *Report of the Miners' Phthisis Commission*, 1902-1903, p. vii, par. 10; *TG* 2, 1908, p. 37, evidence of H. Weldon, Annexure 1, Table A.

24 *Report of the Miners' Phthisis Commission*, 1902-1903, p. vii, par. 10.

25 Fern, p. 874. See also *JCMMS*, Sept. 1903, "Some Mine Gases: Their Toxicology and Possible Connection with Miners' Phthisis", p. 65, discussant Dr D. Macaulay.

26 *Report of the Miners' Phthisis Commission*, 1902-1903, p. vii, par 10.

27 *Report of the Miners' Phthisis Commission*, 1902-1903, p. viii, par. 10.

28 *JCMMS*, Aug. 1903, "Some Mine Gases: Their Toxicology and Possible Connection with Miners' Phthisis", p. 30, discussant Dr L. G. Irvine.

29 *Cd.* 2091, 1904, p. 9.

30 *Cd.* 2091, 1904, p. 8.

31 *Cd.* 2091, 1904, p. 17, Table 16. See also *Cornubian*, 14 May 1904, "The Miners' Scourge".

32 *Cd.* 2091, 1904, p. 18, Table 17.

33 Cf. Van Aswegen, p. 57. Van Aswegen does not observe the trend. Nor does he examine the premise on which the commissioners based their conclusion.

34 *Report of the Miners' Phthisis Commission, 1902-1903*, p. vii, par. 10.

35 *Report of the Miners' Phthisis Commission, 1902-1903*, p. vii, par. 5.

36 *Report of the Miners' Phthisis Commission, 1902-1903*, pp. xx, xxii, para. 64-65, 73.

37 *Report of the Miners' Phthisis Commission, 1902-1903*, p. viii, par. 10.

38 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 3, q. 3, evidence of Dr F. Napier.

39 Oliver, *Diseases of Occupation*, p. 284.

40 See, for instance, Sansom, p. 48; Fern, p. 873; and JCMMS, Aug., Sept. 1903, "Some Mine Gases: Their Toxicology and Possible Connection with Miners' Phthisis", pp. 65, 66, discussants Dr. D. Macaulay and Dr L. G. Irvine.

41 *Report of the Miners' Phthisis Commission, 1902-1903*, p. vi, par. 5. See also *ibid.*, pp. ix, xx, para. 10, 65.

42 *Report of the Miners' Phthisis Commission, 1902-1903*, pp. viii, x, para. 15, 18.

43 *Final Report of the Mining Regulations Commission, 1910*, v. 2, p. 240, evidence of Dr L. G. Irvine.

44 JCMMS, Jan. 1907, p. 230, "Miners' Phthisis on the Bendigo Field"; *THJ*, July 1908, p. 324, "Notes and Comments".

45 *Transvaal Leader*, 11 Aug. 1910, "Phthisis and Politics".

46 Cd. 2091, 1904, pp. 21-22, 32.

47 Cd. 2091, 1904, pp. 10, 32; *Report of the Miners' Phthisis Commission, 1902-1903*, p. 4; JCMMS, Aug. 1903, "Some Mine Gases: Their Toxicology and Possible Connection with Miners' Phthisis", p. 26, discussant Dr L. G. Irvine.

48 Cd. 2091, 1904, p. 30.

49 JCMMS, Sept. 1906, "Safety Measure in Mining", pp. 82-83, discussant W. R. D. Macqueen; Cd. 2091, 1904, pp. 26-29.

50 Cd. 2091, 1904, pp. 26-29.

51 *Report of the Miners' Phthisis Commission,*

1902-1903, p. xxi, par. 71.

52 Cd. 2091, 1904, p. 10.

53 Cd. 7476, 1914, p. 123; Cd. 2091, 1904, pp. 30-31.

54 See, for instance, BRA, HE, v. 258, file 162, L. J. Reyersbach to H. F. Marriott, 20 July 1907.

55 See above, chapter 9.

56 BRA, HE, v. 134, S. Evans to F. Eckstein, 25 Feb. 1907, v. 258, file 162, L. J. Reyersbach to H. F. Marriott, 20 July 1907, R. Schumacher to H. F. Marriott, 29 Nov. 1907, v. 286, file 240V, Memorandum, no. 32, 21 July 1909.

57 TAD, MM, 1395/06, TCM circular letter, no. 16, 6 Sept. 1906. See also JCMMS, Feb. 1906, "Safety Measures in Mining", p. 251, discussant J. Yates; *South African Mines, Commerce and Industries*, 25 Aug. 1906, p. 519, "Mine Ventilation on the Rand"; BRA, HE, v. 258, file 162, L. J. Reyersbach to H. F. Marriott, 20 July 1907; and *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 237, evidence of Dr L. G. Irvine.

58 Cd. 2091, 1904, p. 31.

59 *BMJ*, 23 July 1904, pp. 216-217, "The Health of Cornish Miners"; *Mining Journal*, 24 Dec. 1904, p. 669, "Miners Phthisis and Worm".

60 Cd. 7476, pp. 147-148, 151-152.

61 PRO, CO, 291/90, despatches, Lyttelton to Milner, 14 Jan. 1905, enclosure; *Transvaal Government Gazette*, no. 1100, 22 Dec. 1905.

62 Cd. 2091, 1904, p. 17, Table 16; Cd. 7476, pp. 148, Table 2, 151-152. See also *Mining Journal*, 17 Feb. 1912, p. 159, "Miners' Phthisis: The Penalty for Neglect"; and *TMJ*, July 1908, p. 324, "Notes and Comments".

63 Cd. 7476, pp. 49, 148-149.

64 *Mining Journal*, 17 Feb. 1912, p. 159, "Miners' Phthisis: The Penalty for Neglect".

65 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 31, evidence of T. Mathews and M. Trewick.

66 Macaulay and Irvine, pp. 297-298.

67 JCMMS, Sept. 1906, "Safety Measures in Mining", p. 81, discussant E. M. Weston.

68 Cd. 2091, 1904, p. 25.

69 Cd. 7476, 1914, p. 130.

70 Cd. 2091, 1904, p. 28; JCHMS, Dec. 1906, "Safety Measures in Mining", p. 164, reply to discussion.

71 *Report of the Miners' Phthisis Commission, 1902-1903*, p. xxii; TAD, LTG, v. 168, telegram 2723, Chamberlain to Milner, 18 Nov. 1903.

72 *Transvaal Legislative Council Debates*, W. Wybergh, 23 July 1903, p. 352.

73 See above, chapter 9.

74 *Report of the Miners' Phthisis Commission, 1902-1903*, p. xxi, par. 71.

75 PRO, CO, 291/60, despatches, Lyttelton to Milner, 14 Jan. 1904.

76 PRO, CO, 291/70, despatches, Milner to Lyttelton, 18 April 1904.

77 PRO, CO, 291/70, despatches, Milner to Lyttelton, 18 April 1904, minute by Sir M. Ommanney, 9 May 1904; TAD, GOV, v. 716, file 33/04, Lyttelton to Milner, 13 May 1904; PRO, CO, 291/71, despatches, Lyttelton to Milner, 27 June 1904.

78 TAD, GOV, v. 984, file 33/5/06, Elgin to Selborne, 13 Jan. 1906.

79 *Cornubian*, 20 March 1903, "Sudden Death of Mr W. S. Caine".

80 See, for instance, PRO, CO, 291/75, parliament, 24 Feb. 1904, 291/172, despatches, Lyttelton to Milner, 15 Aug. 1904, enclosure, R. B. Haldane to Elgin, 6 Jan. 1906; TAD, GOV, v. 716, file 33/04, Lyttelton to Milner, 16 June 1904, v. 80, 656/05, Lyttelton to Selborne, 21 Oct. 1905, enclosure; Sir T. Oliver to Lyttelton, 16 Oct. 1905.

81 See above, chapter 9.

82 TAD, GOV, v. 716, file 33/04, Milner to Lyttelton, 18 April 1904. See also, TAD, GOV, v. 716, file 33/04, Lyttelton to Milner, 16 June 1904, enclosure.

83 *TCHMR*, 1904, p. 112.

84 PRO, CO, 291/71, despatches, Lyttelton to Milner, 27 June 1904.

85 PRO, CO, 291/71, despatches, Lyttelton to Milner, 27 June 1904, 291/75, parliament, 24 Feb. 1904, 14 March 1904.

86 Sansom, p. 48; Fern, p. 875. See also PRO, CO, 291/71, despatches, Milner to Lyttelton, 4 July

1904, enclosure, C. L. Sansom to G. Robinson, 2 July 1904.

87 See, for instance, *Transvaal Leader*, December 1902-April 1904 passim; *Rand Daily Mail*, December 1902-April 1904 passim; and *Star*, December 1902-April 1904 passim.

88 PRO, CO, 291/71, despatches, Milner to Lyttelton, 4 July 1904, enclosure, C. L. Sansom to G. Robinson, 2 July 1904.

89 PRO, CO, 291/71, despatches, Milner to Lyttelton, 4 July 1904, minute by Sir M. Ommanney, 27 July 1904.

90 PRO, CO, 291/72, despatches, Milner to Lyttelton, 15 Aug. 1904.

91 PRO, CO, 291/72, despatches, Milner to Lyttelton, 15 Aug. 1904.

92 CAD, MNW, file MM 2288/10, R. N. Kotze to H. W. Smythe, 29 Aug. 1910, enclosure.

93 *Transvaal Government Gazette*, no. 1100, 22 Dec. 1905.

94 See above, chapter 10.

95 Cf. Gray, p. 303, who incorrectly asserts that the government took immediate action as a result of the publication of the Weldon Commission report.

96 TAD, GOV, 656/05, Lyttelton to Selborne, 21 Oct. 1905.

97 *Lancet*, 17 March 1906, p. 795, "Wales and Western Counties Notes".

98 *Mining Journal*, 28 Oct. 1905, p. 470, "Mining".

99 PRO, CO, 291/172, despatches, Lyttelton to Milner, 15 Aug. 1904, enclosure, R. B. Haldane to Elgin, 6 Jan. 1906.

100 TAD, GOV, 23/5/06, Elgin to Selborne, 13 Jan. 1906.

101 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association"; *Transvaal Legislative Council Debates*, H. Weldon, 8 Aug. 1904, p. 570.

102 BRA, HE, v. 258, file 154M, Secretary of the TCM to L. J. Reyersbach, 1 Sept. 1904, enclosure, W. W. Jago to Secretary of the TCM, 25 Aug. 1904.

103 *Transvaal Legislative Council Debates*, H. Weldon, 8 Aug. 1904, p. 570.

- 104 Monthly minutes of the AMM, 2 Aug. 1903.
- 105 JCHMS, July 1905, p. 7, "Presidential Address".
- 106 Cullen passim.
- 107 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association".
- 108 JCHMS, July 1902-Dec. 1910 passim.
- 109 Macaulay and Irvine passim.
- 110 *Final Report of the Mining Regulations Commission*, 1910, v. 2, pp. 234-264 passim, evidence of Dr L. B. Irvine. Irvine presented the evidence on behalf of both himself and Donald Macaulay. Macaulay had become a politician and was the Denver representative of the Progressive Party in the Transvaal Legislative Assembly.
- 111 *Transvaal Leader*, 11 Aug. 1910, "The White Death".
- 112 *Final Report of the Mining Regulations Commission*, 1910, v. 1, pp. 281-282.
- 113 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association"; CAD, MNW, file MM 2288/10, R. N. Kotze to H. W. Smythe, 29 Aug. 1910. See also TAD, MM, 2095/05, U. P. Swinburne to Secretary of the Chemical, Metallurgical and Mining Society of South Africa, 18 Jan. 1906.
- 114 CAD, MNW, file MM 2288/10, H. W. Smythe to R. N. Kotze, 23 Aug. 1910, enclosure.
- 115 PRO, CO, 291/77, despatches, Lyttelton to Selborne, 31 Dec. 1904, enclosure; *Transvaal Government Gazette*, no. 1100, 22 Dec. 1905.
- 116 *TWJ*, Feb. 1906, p. 210, "Health Regulations for Miners".
- 117 PRO, CO, 291/172, despatches, Lyttelton to Milner, 15 Aug. 1904, enclosure, R. B. Haldane to Elgin, 6 Jan. 1906.
- 118 *Final Report of the Mining Regulations Commission*, 1910, v. 1, p. 282.
- 119 See, for instance, BRA, HE, v. 258, file 154M, Secretary of the TCM to L. J. Reyersbach, 1 Sept. 1904, enclosure, W. W. Jago to Secretary of the TCM, 25 Aug. 1904; JCHMS, Oct 1906, "Safety Measures in Mining", p. 118, discussant J. W. Bradford; and Macaulay and Irvine, p. 300.
- 120 *South African Mines, Commerce and Industries*, 28 April 1906, p. 150, letter by E. P. Rathbone.

121 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 282. See also BRA, HE, v. 244; file 107H, S. Jennings to H. Eckstein and Company, 9 Oct. 1906.

122 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 30, evidence of T. Mathews and M. Trewick.

123 Council minutes of the AMM, 2 Nov. 1905, 16 Jan. 1906.

124 *TMJ*, Feb. 1906, p. 209, "Health Regulations for Miners".

125 Council minutes of the AMM, 8 Nov. 1905.

126 *TMJ*, Feb. 1906, p. 209, "Health Regulations for Miners".

127 Monthly minutes of the AMM, 20 Feb. 1906.

128 SD 10, 1912, p. 116, q. 912, evidence of R. W. Schumacher.

129 Monthly minutes of the AMM, 16 Jan. 1906.

130 *TMJ*, Feb. 1906, p. 209, "Health Regulations for Miners".

131 CAD, MNW, file MM 2288/10, H. W. Smythe to R. N. Kotze, 23 Aug. 1910, enclosure.

132 CAD, MNW, file MM 2288/10, R. N. Kotze to H. W. Smythe, 29 Aug. 1910, enclosure.

133 See, for instance, *JCMMS*, July 1905, p. 7, "Presidential Address", Aug. 1906, Oct. 1906, "Safety Measures in Mining", pp. 39, 119, discussants, J. M. Johnson and D. W. Bradford.

134 *JCMMS*, Oct. 1906, "Safety Measures in Mining", p. 118, discussant D. W. Bradford.

135 BRA, HE, v. 256, file 240V, G. E. Webber to L. J. Meyersbach, 2 July 1906.

136 *Report of a Commission...Mining by Single Outlet*, pp. 107-108, evidence of H. Weldon.

137 Grey, p. 37.

138 PRO, CO, 291/60, despatches, Milner to Lyttelton, 7 Dec. 1903, minute by F. Graham, 4 Jan. 1904.

139 Chamberlain Papers, no. 13/1/1-28, memorandum by L. Mountbatten, 13 Dec. 1901; PRO, CO, 291/60, despatches, Milner to Lyttelton, 7 Dec. 1903, minute by F. Graham, 4 Jan. 1904.

140 See, for instance, Chamberlain Papers, no. 13/1/1-28, memorandum by L. Mountbatten, 13 Dec. 1901.

141 PRO, CO, 291/60, despatches, Milner to Lyttelton, 7 Dec. 1903, enclosure, W. Wybergh to Lawley, 13 Jan. 1903.

142 PRO, CO, 291/60, despatches, Milner to Lyttelton, 7 Dec. 1903, enclosure, W. Wybergh to Lawley, 13 Jan. 1903, and minute by F. Graham, 4 Jan. 1904.

143 PRO, CO, 291/60, despatches, Milner to Lyttelton, 7 Dec. 1903, minute by F. Graham, 4 Jan. 1904.

144 PRO, CO, 291/60, despatches, Milner to Lyttelton, 7 Dec. 1903, minute by H. Lambert, 5 Jan. 1904. Clearly the circumstances surrounding the resignation of W. Wybergh need further research.

145 TG 2, 1908, pp. 360, 374, qq. 3 603, 3 841, evidence of R. B. Greer and T. Willis.

146 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association".

147 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association"; TG 2, 1908, p. 451, qq. 4 951-4 952, evidence of T. Mathews.

148 BRA, HE, v. 244, H. W. Smythe to Secretary of the TCM, 1 June 1906; *GNEAR*...30 June 1906, p. 56; TAD, MM, 1395/06, H. W. Smythe to Secretary of the TCM, 1 June 1906.

149 BRA, HE, v. 286, file 240V, G. E. Webber to L. J. Rayersbach, 2 July 1906; *JCMMS*, Dec. 1906, "Safety Measures in Mining", p. 163, reply to discussion.

150 *Final Report of the Mining Regulations Commission*, 1910, v. 1, pp. 281-282; CAD, MNW, file MM, 2208/10, R. N. Kotze to H. W. Smythe, 29 Aug. 1910, enclosure.

151 *Final Report of the Mining Regulations Commission*, 1910, v. 1, p. 282.

152 *Transvaal Government Gazette*, no. 1278, 24 Dec. 1908.

153 CAD, MNW, file MM 2288/10, R. N. Kotze to H. W. Smythe, 29 Aug. 1910, enclosure.

154 TG 2, 1909, p. 41.

155 Merriman Papers, correspondence, J. de Villiers to JXM, 30 May 1907.

156 *Transvaal Debates: Both Houses of Parliament*, J. de Villiers, 29 April 1910, col. 523.

157 *Transvaal Debates: Both Houses of Parliament*, J. de Villiers, 6 April 1910, cols. 635-636.

158 Grey, pp. 275 ff; Thorpe, pp. 342 ff; Yudelman, pp. 73-74.

159 *Rand Daily Mail*, 27 June 1910, "The Miners Friend", 27 July 1910, "Miners Phthisis" and "Labour Men at the Robinson Deep", 30 July 1910, "M... Phthisis", 7 Sept. 1910, letter by N. Z.; B... 4E, v. 252, file 154M, memorandum by W. Gemmill; *Transvaal Leader*, 17 Aug. 1910, editorial, 27 Aug. 1910, editorial.

160 For details, see Garson, *Louis Botha or John X. Merriman: The Choice of South Africa's First Prime Minister*, pp. 3-34 passim.

161 It is beyond the scope of this study to discuss the arrangements made for the compensation of miners. Mining house spokesmen emphasised the advantages of the tripartite system as practised in Germany. See, for instance, *Rand Daily Mail*, 12 Aug. 1910, "Disease in the Mines", 2 March 1911, "Miners' Phthisis", 4 March 1911, editorial; *Transvaal Leader*, 27 Aug. 1910, editorial; and SC 10, 1912, p. 121, qq. 964-966, evidence of R. W. Schumacher.

162 See, for instance, *Transvaal Leader*, 11 Aug. 1910, editorial, 20 Aug. 1910, "Mr. Hull and Phthisis", 30 Aug. 1910, editorial.

163 UG 40, 1913, p. 112; Merriman Papers, letterbook, JXM to S. Evans, 13 Aug. 1913.

164 UG 40, 1913, p. 9.

165 GNEAR...30 June 1907, p. 65.

166 TG 2, 1908, p. 31, qq. 547-567, evidence of H. Weldon.

167 See Grey, p. 40, who lists the routine jobs of inspectors.

168 The history of accidents on the Witwatersrand mines is a neglected area of study and warrants research.

169 *Rand Daily Mail*, 18 Jan. 1912, "Fatalities in Mines". See also UG 40, 1913, pp. 112-113; and SANR, 23 Aug. 1913, "Passing Events".

170 UG 40, 1913, p. 113

171 J. Pratt Johnson, p. 343.

172 SC 4, 1914, p. 300, q. 1 656, evidence of R. N. Kotze.

- 173 J. Pratt Johnson, p. 343.
- 174 TG 2, 1908, p. 452, q. 4 961, evidence of T. Mathews.
- 175 J. Pratt Johnson, p. 335.
- 176 *Transvaal Leader*, 23 Aug. 1910, letter by "A Miner".
- 177 SC 4, 1914, pp. 282, 291-292, qq. 1 558, 1 588-1 589, evidence of R. N. Kotze.
- 178 SC 4, 1914, pp. 300-301, qq. 1 653-1 656, evidence of R. N. Kotze. See also *Union House of Assembly Debates*, J. X. Merriman, 16 June 1913, col. 3541; TG 2, 1908, pp. 357, 452, qq. 3 562, 4 961, evidence of R. B. Greer and T. Mathews; J. Pratt Johnson, p. 343.
- 179 UG 40, 1913, p. 147.
- 180 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 145, evidence of M. Fergusson.
- 181 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association".
- 182 Katz, *A Trade Union Aristocracy*, pp. 329-330.
- 183 See, for instance, Jourdan, pp. 48-51 passim; and JSAIE, Jan. 1912, "The Prevention of Dust in Development Drives in Mines during Drilling Operations", pp. 139-140, discussant K. Austin.
- 184 Merriman Papers, correspondence, R. Barry to JXM, 15 Dec. 1911.
- 185 JCMMS, Aug. 1906, "Safety Measures in Mining", p. 39, discussant A. M. Johnston.
- 186 TCMAR, 1904, pp. 118-123 "Miners' Phthisis Competition Committee".
- 187 *Report of the Miners' Phthisis Commission, 1902-1903*, p. xxi, par. 71.
- 188 See, for instance, *Star*, 16 Oct. 1902, "Underground Dust", 17 Oct. 1902, "Miners' Phthisis"; and *Transvaal Leader*, 6 May 1904, "Mining".
- 189 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miner Association".
- 190 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association".
- 191 JCMMS, Sept. 1906, "Safety Measures in Mining", p. 82, discussant W. R. O. Macqueen.

192 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association", H. W. Smythe to Secretary of the TCM, 1 June 1906, Assistant Secretary of Mines to Secretary of the TCM, 12 July 1906, Secretary of the TCM to Acting Secretary of the Mines Department, 25 Aug. 1906; BRA, HE, v. 244, file 107H, S. Jennings to H. Eckstein and Company, 9 Oct. 1906.

193 BRA, HE, v. 244, file 107H, S. Jennings to H. Eckstein and Company, 9 Oct. 1906, v. 286, file 240V, memorandum by G. E. Webber, 2 July 1906.

194 JSAIE, "The Prevention of Dust in Development Drives in Mines during Drilling Operations", Oct. 1911, p. 54, discussant K. Austin. See also van Niekerk, p. 235.

195 TG 2, 1908, p. 475, q. 5 322, evidence of D. Hadenfeld.

196 *Report of the Miners Phthisis Commission, 1902-1903*, p. xii, pars. 28-32; Cd. 2091, 1904, pp. 25-26.

197 See, for instance, JCHMS, April 1903, "Miner's [sic] Phthisis: Some Notes and Suggestions", p. 262, discussant C. Dixon.

198 TG 2, 1908, pp. 372, 691, qq. 3 816, 8 879, evidence of T. Willis and F. Crean.

199 Macaulay and Irvine, p. 300; TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association".

200 *Final Report of the Mining Regulations Commission, 1910*, v. 2, p. 31, evidence of T. Mathews and M. Trewick. See also TG 2, 1908, p. 455, q. 5 011, evidence of T. Mathews.

201 JCHMS, June 1913, "Interim Report of the Miners' Phthisis Prevention Committee".

202 GMEAR...30 June 1902, p. 8.

203 C. Bickard Jeppe, v. 1, p. 148; *South African Mines, Commerce and Industries*, 5 March 1904, p. 148, "The Future of the Rock Drill".

204 TG 2, 1908, p. 455, qq. 5 016-5 017, evidence of T. Mathews; Cope, p. 50.

205 JCHMS, Feb. 1906, p. 258, "Mining".

206 PRO, CO, 351/49, parliament, minute by H. Just, 9 July 1913.

207 TG 2, 1908, p. 455, qq. 5 016-5 017, evidence of T. Mathews; Cd. 7478, 1914, p. 59, qq. 20 499-20 505, evidence of W. C. Stephens.

208 PRO, CO, 291/113, despatches, Selborne to Elgin, 17 Jan. 1907, telegram; Cd. 7478, 1914, p. 59, q. 20 504, evidence of W. C. Stephens; JSAIE, 25 March 1903, "The Prevention of Miners' Phthisis by Ventilation", pp. 123-124, discussant D. Brodigan.

209 JSAIE, 25 March 1903, "The Prevention of Miners' Phthisis by Ventilation", pp. 123-124, discussant D. Brodigan.

210 *The Prevention of Silicosis on the Mines of the Witwatersrand*, 1937, p. 98.

211 JSAIE, 25 March 1903, "The Prevention of Miners' Phthisis by Ventilation", pp. 123-124, discussant D. Brodigan.

212 TG 2, 1908, p. 456, q. 5 017, evidence of T. Mathews.

213 *South African Mines, Commerce and Industries*, 21 May 1904, p. 227, "Miners' Phthisis".

214 For the same reasons the Australian mineowners also rejected the Leyner Drill. See JCHMS, Feb. 1906, p. 258, "Mining". Mining engineers did not experiment with the Leyner Drill in Cornwall. See JCHMS, Sept. 1906, "Safety Measures in Mining", pp. 82-83, discussant W. R. O. Macqueen.

215 Macaulay and Irvine, p. 227. According to Owen Letcher, who compiled a history to commemorate the mining industry's Jubilee in 1936, the expense of the Leyner Drill did not deter the mining engineers, George and Harry Denny, from using it on the Meyer and Charlton. In Letcher's view, the brother pioneered dust control. See Letcher, p. 156. I have found no contemporary evidence, however, which supports Letcher's argument.

216 PRO, CO, 551/49, parliament, minute by H. Just, 9 July 1913.

217 *The Prevention of Silicosis on the Mines of the Witwatersrand*, 1937, p. 98.

218 Cd. 7478, 1914, p. 55, qq. 20 499-20 505, evidence of W. C. Stephens.

219 Theoretically the drills should not have produced dust at all. They were not, however, immune to wear. In 1915 the Miners Phthisis Prevention Committee found that leaks of compressed air atomised the "dirty water" [my italics] with which they were fed, so producing particles of fine dust. See TCMA, file M27, circular letter, no. 101, enclosure, A. Spicer to Secretary of the TCM, 7 Dec. 1916.

220 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association".

221 For a good description of the jet, see

JCMMS, Oct. 1906, "Safety Measure in Mining", p. 113, discussant M. H. Coombe.

222 *Report of the Miners' Phthisis Commission, 1902-1903*, pp. 108-109, qq. 883-892, evidence of T. McIsaac.

223 BRA, HE, v. 244, file 107H, S. Jennings to H. Eckstein and Company, 9 Oct. 1906.

224 JCMMS, Sept. 1906, "Safety Measures in Mining", p. 81, discussant E. M. Weston.

225 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 9, q. 3, evidence of Dr F. Napier; *South African Mines, Commerce and Industries*, 2 May 1904, p. 226, "Miners' Phthisis"; Praagh, p. 248.

226 Browne, p. 327. See also TG 2, 1908, p. 431, q. 4 611, evidence of T. Mathews.

227 JCMMS, Sept. 1906, "Safety Measures in Mining", p. 81, discussant E. M. Weston.

228 *Report of the Miners' Phthisis Commission, 1902-1903*, pp. 108-109, qq. 883-892, evidence of T. McIsaac.

229 Fern, p. 875; TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association".

230 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association"; Cd. 7478, 1914, p. 44, qq. 45-46, evidence of W. C. Stephens.

231 TCMAR, 1904, pp. 121-122.

232 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association"; TG 2, 1908, p. 374, q. 3 839, evidence of T. Willis.

233 JCMMS, Sept. 1906, "Safety Measures in Mining", p. 81, discussant E. M. Weston.

234 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association".

235 JSAIE, Jan. 1912, "The Prevention of Dust in Development Drives in Mines during Drilling Operations", p. 139, discussant K. Austin.

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290 TAD, MM, 1395/06, 22 May 1906, "Deputation from the Transvaal Miners' Association".

291 TAD, MM, 1395/06, "Ventilation of Mines: Precis".

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321 *The Prevention of Silicosis on the Mines of the Witwatersrand*, 1937, p. 11.

322 TG 2, 1908, p. 113, q. 355, evidence of L. J. Reyersbach. See above, chapter 5.

323 Browne, p. 296.

324 Denny, p. 84. See also Truscott, p. 459.

325 Taylor, p. 125.

326 Frankel, *Investment and the Return to Equity Capital in the South African Gold Mining Industry 1887-1965: An International Comparison*, p. 28, table showing average yearly grade of ore. Richardson, *Chinese Mine Labour in the Transvaal*, p. 12, also shows this.

327 Van-Helten, pp. 52-53.

328 TG 2, 1908, pp. 166-167, qq. 1 504-1 508, evidence of E. J. Way.

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331 UG 40, 1913, p. 148.

332 *Rand Daily Mail*, 19 Feb. 1912, "Accidents in Mines".

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CHAPTER 12

THE SACRIFICIAL YEARS 1902-1910

"There are two points about our great gold industry that the world most cheerfully condones, the Death Rate and the Dividends."---*Evening Chronicle*, 1913.¹

"All the gold in South Africa cannot compensate these martyrs [the miners] for the sufferings they endure. The sight at their death beds will never be forgotten by me till my dying day."---Nurse, M. Wilson, 1913.²

On 1 August 1912 the Miners' Phthisis Act, which prescribed compensation for miners disabled by silicosis, came into force in South Africa. In terms of section (3) of the act the Miners' Phthisis Board was constituted. The functions of the board were to consider applications for the award of compensation and to make the awards in terms of the act.³ In its first six-monthly report, from 1 August 1912 to 31 January 1913, the Miners' Phthisis Board included a schedule which showed the extent to which the lives of 200 miners, taken at random, had been curtailed by silicosis.⁴ The table consisted of three columns: the

first categorised the years of service of the compensated miners; the second listed, according to the Carlisle Table, the average life expectancy of "normal" men at a similar age; and the third indicated the number of years that the doctors expected each category of disabled miners to live. Therefore the difference between columns two and three showed the extent to which silicosis had shortened the miners' lives. For instance, the disabled miners who had the shortest average period of mine service, namely three years, should have lived, according to the Carlisle Table, for another thirty-one years. Instead, the doctors estimated their life expectancy as being only three years and six months. In brief, the lives of these disabled miners had been shortened by twenty-seven and a half years. Likewise, those miners with the longest average period of service, namely that of nine years and six months, whose life expectation, compared to "normal" men, should have been twenty-six years, was, according to the doctors' calculations, only one and a half years. Silicosis had therefore curtailed their lives by twenty-four and a half years.⁵

After he had received the report of the Miners' Phthisis Board, the left-wing British journalist, Alfred E. Randall, wrote an article for the *New Age*. Entitled "The Price of Gold", the article condemned as a "shameful scandal" the industry's "wholesale murder" of both white and African mineworkers.⁶ In his article

Randall repeated at length the critical findings of the consulting mining engineer, E. J. Moynihan. Also, Randall drew the attention of the public to the Miners' Phthisis Board's report and interpreted in detail the table which contained the doctors' estimates for the life expectancy of disabled miners.⁷

The Chamber of Mines reacted with alarm to the adverse press publicity in Britain. In particular, it was most perturbed by the comparisons of compensated miners' lives, the "select few" as it called them, with the expected lives of the "general population" as reflected in the Carlisle Table. In the Chamber's view, the "misleading" schedule in the report of the Miners' Phthisis Board, had provided the industry's opponents with "their main grounds of attack". "The facts are sufficiently serious", the executive declared, "without [the need for] exaggeration."⁸

Unlike the mineowners, the miners did not agree that the schedule in the Miners' Phthisis Board's report presented a "fallacious conclusion".⁹ In 1912 the Van Niekerk Commission investigating silicosis had already statistically proved that, although miners died at an average age of 33.12 years, the modal, or commonest age, of death was only 29.51 years.¹⁰ Although these data reflected the mortality of miners in 1912, it is highly probable that they represented the death rate scenario for the pre-Union period. Both the estimated life of disabled miners, as reflected in the schedule of the Miners' Phthisis

Board's report, and the modal age of death, as the Medical Commission calculated, were also probably an accurate reflection of the position during the period 1903 to 1910.

This chapter examines the miners' perceptions of silicosis. The impact of the occupational disease on the Witwatersrand miners partly explains the growth of their militancy which peaked during the mine-wide strike of 1907.

The chapter also assesses the prevalence of and death rate from silicosis amongst white miners and black mineworkers during the period 1903 to 1910. As we have noted, from 1906 the census officer for the Redruth district in Cornwall, was obliged to keep epidemiological, geographical and occupational records of the mortality from silicosis amongst Cornish miners. These statistics therefore indicated whether migrant miners who had returned home to Cornwall to die had worked solely in the Transvaal gold mines. They also showed the deceased miners' length of service on the Witwatersrand mines and noted their occupations, including rock drill work.¹¹

Except for the census records of the Redruth district, we have no accurate official statistics for the mortality from silicosis on the Witwatersrand during the period 1902 to 1910. We must therefore rely for our findings concerning the mortality from silicosis on the Witwatersrand gold mines on the

Cornish statistics. To reinforce and to supplement the Cornish records we depend, too, on local informal records, which include the weighty impressionistic evidence of miners, mining officials and a few concerned health officers.

It was only from June 1911 that the Transvaal Miners' Association began to keep a record of deaths amongst its members.¹² Even so, from its inception in 1902 the union was well aware that silicosis was responsible for depleting its membership. The most important job of the union's typist, Mary Fitzgerald, the only paid employee the organisation could afford from 1902 to 1906, was to take collection sheets to the various mines for funding miners' funerals.¹³ Few miners had dependents resident in South Africa and families of the deceased could not afford the £21 required for the funeral.¹⁴ "Everything costs a lot," was the comment to his mother of a temporary mineworker, John Cockerill, after giving a funeral contribution in 1904.¹⁵ No miner wanted a pauper's grave either for himself or for his comrades; and the union took it upon itself to ensure that its members, as well as other miners, were buried with respectability at a "private funeral".¹⁶

In 1906 the manager of the Wolhuter, T. J. Britten, who had won the Chamber's competition for his atomiser, wrote to the President of the Chamber, J. N. de Jongh, expressing his distress at the mortality from silicosis amongst miners. He claimed that the

"heavy mortality" from the disease was the "same today as attracted my attention seven years ago".¹⁷ In 1911, when union records could verify the mortality of members, at least four members of the Transvaal Miners' Association, at an average age of thirty-eight years, were dying each week.¹⁸ It is therefore reasonable to suggest that this was true, too, of previous years. Such statistics did not include non-unionists and miners who had returned home to die.¹⁹ Indeed, C. B. Saner, a member of the South African Institution of Engineers, told his society in 1911

that when he came back from a short holiday in Europe, he was shocked by the reports that so many of his old friends and fellow workmen had died - from phthisis - whilst he had been away.²⁰

Impressionistic reports confirm this horrific death toll. Although it has become a legend in South African trade union history,²¹ the fate of the members of the 1907 miners' strike committee must be repeated. By 1914 only one of the eighteen-member strike committee was still working: one had died in an accident; of the remaining seventeen, thirteen had died from silicosis and two were in the terminal stages of the disease.²² In 1906 and 1907 mine officials and miners recounted similar morbid experiences: most miners whom they had known personally seven years earlier had died of silicosis.²³ Collectively the deaths amounted to "thousands".²⁴

In 1906 M. H. Coombe, the manager of the State Mine, reproved John Yates, a consulting engineer for the Barnato group and Professor of Mining at the South African School of Mines and Technology, for claiming that mining on the Witwatersrand "carried no more danger" than the "same calling in other countries". Coombe stated firmly:

I have the honour to be a member of the Rand Pioneer Association and I venture to say, from enquiries I have made, that I am the only surviving member of the Association who used to run a rock drill here when they were first introduced to these fields.

Many of the pioneers came as miners to open up these outcrop mines, and when these machines were first brought to the Langlaagte Estate, Ferreira and other mines, many of us thought we could make a few pounds extra per month thereby. We did so. To-day I know of only two men left out of scores that were confrères with me in learning the rock drill work. The majority of the men I knew are up in the Braamfontein cemetery, but a good many died [of miners' phthisis] during the war in the Old Country, and others in America, New Zealand and Australia.²⁵

Thomas Mathews, the organizer of the Transvaal Miners' Association, corroborated Coombe's grisly statement. In 1907 Mathews told the Mining Industry Commission that he knew of only one rock driller, James Coward, who was still alive amongst those he had known in 1897, the year in which Mathews had come to the Witwatersrand.²⁶ Clearly there was much substance to the claim in 1907 of an Australian rock driller, Samuel Crowle, that "at the present time we are dying faster than we are made".²⁷

The deaths were not confined to rock drillers, who died on average after seven years on the machines. The British regulations, as we have seen, stipulated that broken rock be wetted both "in ends, or rises, and as far as practicable in other places".²⁸ But in the Transvaal, because the regulations did not prescribe it, management made no provision whatsoever for allaying dust generated in shovelling and tramming. The result was that hand stopers were exposed constantly to a "cloud of dust".²⁹ Also, as we have noted, after 1908, when a regulation enforced the wetting of ore,³⁰ the reluctance of the mineowners to install water service pipes caused the persistence of dust densities in the stopes. Clearly by 1910 hand stopers and even specialist pitmen, who had been exposed continuously to the inordinately high dust levels on the Witwatersrand mines swelled the ranks of the dead.

In 1904 Dr L. G. Irvine informed the public that general miners had an advantage over rock drillers of an additional ten to fifteen years of service.³¹ A working life of fifteen to twenty-two years could hardly have been a reassuring message for general miners. But Irvine's cautious prognosis proved to be incorrect. Hand drillers, too, contracted accelerated silicosis but in a less rapidly progressive form. Although not conclusive, the following impressionistic evidence of miners, which mine managers and engineers confirmed, suggests that many general miners died on

average twelve to fifteen years after beginning to work on the Witwatersrand.

In 1907 Thomas Mathews asserted to the Mining Regulations Commission that one in four deaths from silicosis occurred amongst hand drillers.³² He also cited the case of the Simmer and Jack on which only two hand drillers, who had begun work on the Rand during the pre-war years, had survived until 1907.³³ Mathews's findings confirmed the warnings of T. Lane Carter, the manager of the French Rand. As early as 1903 Carter predicted:

Some seem to think that the machinemen are the only ones liable to contract miner's [sic] phthisis, but I firmly believe that in a mine where water is scarce...every one working continuously in the mine will eventually contract the disease. Of course men working on the machines are in much greater danger than others, but when dust is distributed freely all workers are in danger.³⁴

At a meeting in 1912, members of the South African Institution of Engineers confirmed that the low standard of mining on the Witwatersrand could be attributed to the scarcity of overseas professional miners. J. Moyle Phillips amplified:

As has already been remarked by other members we have not enough old hands left; those who are still alive are but as a drop in a bucket of water, and nearly eaten up with phthisis. I only know of two men here at the present time - I am referring to miners - who were here in 1888, and the men whom I knew prior to the war and are alive and working to-day could be counted on the fingers of one hand.³⁵

Clearly the miner, who took the following chance in 1910, did not risk losing his money:

I am open to bet my next month's cheque that it is impossible to find anywhere 200 miners alive to-day who were mining on the Reef here before the war, and there are hundreds buried i Braamfontein d in Cornwall and Cumberland who only started mining here after 1901.³⁶

From 1903 the Reef no longer attracted immigrant miners. At overseas mining camps the notoriety of the Witwatersrand as being a "death trap for miners and a badly paid place" gained ground steadily.³⁷ For instance, when Eldwin Moore, an Australian miner returned home for Christmas in 1906, miners there told him he was "a fool to be working underground" on the Witwatersrand.³⁸ In 1907 even the local Transvaal mining journal, which was usually reticent about the mortality from silicosis, urged the elimination of the disease to promote the return of the overseas professional miners so that efficient standards of mining could be restored:

Phthisis has killed such a large number of young, strong labourers, that many miners in Europe and America prefer to stay in their own countries, earn lower wages, and live, rather than come to the Rand, earn a higher wage, and die.³⁹

Indeed, in 1910 miners claimed justifiably that "the Reef" had "the worst reputation in the world".⁴⁰

By 1911, according to the Government Mining Engineer, Robert Nelson Kotze, because of the ravages of the occupational disease the immigration of miners

to the Rand had all but "dried up".⁴¹ Management deplored the loss of skilled manpower, but agreed with J. Moyle Phillips, a mechanical engineer, that the Witwatersrand had few inducements to offer overseas professional miners:

A good practical man - such as we are greatly in need of here - can earn a good wage in his own country, so unless something very enticing is offered him he will not leave home. Formerly there was the "bait" of a big cheque, but since it is now known what price he has to pay for it he will not bite, and even if he does, it is not in order to stop...here and make it his home.⁴²

In 1911 overseas miners had little need for the warning of J. Ambrose Pratt, the journalist who accompanied the Australian Premier, Andrew Fisher, on his tour of South Africa in 1910:

Miners of England and Australia, however poor may be your lot, however dark your present prospects, let no man tempt you to South Africa with tales of the wages that are paid upon the Rand! The wages are high indeed, but the price the workers pay for them is paid in suffering and blood. Better a thousand times to perish as paupers in your own country, if such a chance should hap, than race to an early tomb in a hot, deep African cavern.⁴³

Pratt was influenced by the views of the independent consulting mining engineer, E. J. Moynihan, a well-known critic of the mineowners. Indeed, Pratt quoted these views at length in his book. Also, Moynihan's assessments of the ravages of silicosis prompted Pratt to publish his caveat to the overseas miners.⁴⁴

At the end of 1905 reports from consulting engineers and mine managers concerning the "incompetence" and the "inefficiency" of the miners, but not of the artisans, began to disturb the mineowners.⁴⁵ At this time the industry was experiencing great difficulty in attracting overseas capital, which was crucial for developing the second and third row of deep level mines.⁴⁶ Also, the mineowners' new policy of mining ores with lower values than before, which in turn yielded narrow profit margins, reinforced the reluctance of overseas investors to commit themselves to the Witwatersrand gold mines.⁴⁷ Samuel Evans, of the Corner House, complained to his fellow-director, Raymond Schumacher, that "reliable competent miners are much scarcer to-day even than they were when you left [on vacation for Europe]".⁴⁸ Lionel Phillips was even more emphatic. He declared to Selborne, the Governor of the Transvaal: "The fact is that there is a great scarcity of competent underground miners."⁴⁹

Admittedly there was a large and ever-growing number of "scratch" miners, who had been born in South Africa.⁵⁰ Despite their poor training and low level of efficiency, the South African workmen obtained their blasting certificates with ease after working underground for periods which ranged from only one to six months.⁵¹ One reason that this "mushroom lot" of local miners could obtain billets readily was the growth of the industry.⁵² More important, locally

trained miners had no competition from new professional arrivals from abroad. Consequently management had no option but to employ South African miners in the vacancies created by the deaths and incapacitation from silicosis of the "old-timers".⁵³ The popular myth is that Afrikaners entered the industry in large numbers only after they were employed as strike-breakers during the 1907 miners' strike. But the contrary is true; an ever-growing number of Afrikaners was working as miners long before the strike.

By 1906 the average standard of practical work amongst professional miners was also declining. The reason was obvious to perceptive mine managers. The more recent professional miners, as with some of their predecessors, seldom lived "long enough to develop their skill to the highest point of perfection".⁵⁴ In 1906 the chemist to the Department of Mines, Dr James Moir, in a discussion at the Chemical Society concerning the efficiency of miners, expressed the "distinct fear that there will be no miners left in a year or two except the younger and more unskilled ones".⁵⁵ But in the absence of effective dust prevention measures the prognosis for the young miners was also morbid.

Enlightened mine managers were well aware that the "old guard of machine men, who did such good work on the Rand in the days gone by",⁵⁶ were no longer alive. Likewise, in 1907 a mining material merchant,

Reuben Greer, who had a long connection with three mines, explained cynically to the Mining Industry Commission the reason that the industry was experiencing a problem with the efficiency of miners: "Like the Irishman's potatoes, the best are under the ground, and you have not the skilled white miners you had in those days."⁵⁷ But the mineowners ignored the advice of management that the industry could not attract an "adequate" supply of skilled manpower given the low level of spending the mineowners were prepared to devote to preventing silicosis. Clearly the Randlords did not believe that the elimination of the disease was justified by the profits they could make.

As early as 1903 the overseas miners began to leave the Rand. The *Cornubian* reported:

Very lately thirteen miners with their families left the Rand to return to England, the cause of their departure being the fear of the death in store for the former if they continued to work there.⁵⁸

Others followed suit in a slow trickle.⁵⁹ The upswing of tin mining in Cornwall, which started in 1906, also attracted miners to return home: they exchanged high money wages for health.⁶⁰ The greatest exodus, however, occurred after the 1907 strike: miners were no longer prepared to risk their lungs for reduced wages and lower contract prices, the penalty they paid for losing the strike to the mineowners.⁶¹ Many professional miners refused to work on the gold mines without being paid danger money.

Although miners who remained on the Reef knew that certain death awaited them, even when their lungs were affected by dust they distanced themselves from that morbid reality. Like James Coward who, as we have noted, "gloried in rock drilling work",⁶² many miners buoyed themselves with an optimistic spirit, which the consulting engineer, E. J. Moynihan, defined in 1910:

The average consumptive patient is possessed by the "spes thisica", the "hopeful madness" to which consumptive patients are subject. This makes them talk gaily of what they are going to do 10 years hence, when they are really going to be buried in 10 days; and explains why rock-drill men, even when they get phthisis, usually go on with this work until it kills them.⁶³

The miners' "hopeful madness", to which Moynihan referred, was, in fact, fear. Hope was all that the miners had left when they were afraid to face what was real.

The suffering of the silicotic miners distressed observers who produced eye-witness accounts. Such accounts capture more graphically than the clinical descriptions of doctors, quoted earlier, the agony which afflicted miners experienced.⁶⁴ When a visitor to Johannesburg went to the offices of the Transvaal Miners' Association to see his friend, Thomas Mathews, he was overwhelmed by "sorrowful and sad sights", which he captured in a letter to the press:

As I waited in the outer office the door of the inner office opened and a tall thin-faced man came out. He looked ill, and as he passed out the door a violent fit of coughing seized him, and then I knew that I

was looking at another victim of the dread disease...I passed into the inner office and before me was another miner [Thomas Mathews] coughing his lungs out.⁶⁵

The torture suffered by miners in the advanced stage of the disease, shocked even nurses, inured to the pain of their patients. M. Wilson, who had been a nurse for many years, described as "mere details" the "horrible scenes" induced by other illnesses compared to those which silicosis caused. She added:

I've known great strong men reduced to mere living human skeletons, gasping, praying and begging of us to get them breath.⁶⁶

Indeed, few illnesses could do more than silicosis to "lower a man's vitality, to depress his spirits, and to take all heart out of him". Even so, a Church of England chaplain, G. B. Carlisle, marvelled at the "courage and hopefulness" with which miners "faced the inevitable end".⁶⁷

As there was no cure for the disease, doctors could advise patients only to "renounce their work in the very earliest stages of the illness".⁶⁸ But as Eustace Hill, a Church of England priest, explained in 1910, few miners were in a position to accept this medical advice:

[Many] have to stay at work which they know is killing them, because they have wife and children dependent on them, and no job on the surface can be found for them. Self-sacrifice such as this can only elicit our pity and indignation.⁶⁹

Doctors could only try to alleviate some of the the more distressing symptoms of the disease with medication, including painful intra-muscular

injections.⁷⁰ Although they acknowledged that such treatment was useless, doctors, like P. A. Nightingale, scorned miners who, not surprisingly, resorted to using old wives' remedies:

Many rock-drill miners on the Rand have assured me that the best prophylactic against miners' phthisis is a plug of tobacco kept in the pouch of the cheek - this invaluable secret having been confided to them by their fathers and grandfathers who worked in the Cornish tin mines!⁷¹

Miners, too, provided bogus doctors with a gullible and ready market for their quack medicines, of which "Lungsava" was the most popular during the period.⁷² A certain Mr Stevens, purporting to be a doctor, made and marketed "Lungsava", a concoction consisting of a root, which the Africans used as an emetic, mixed with alcohol.⁷³

Except for L. G. Irvine and D. Macaulay, the Witwatersrand doctors were singularly indifferent to the problem of silicosis. After 1904 not a single doctor presented a paper at annual medical conferences, published a journal article and wrote to the press to stimulate public and medical concern with the toll that the disease was exacting amongst miners.⁷⁴ Indeed, doctors were so uninterested in the subject, that in 1910, when the acting Premier of Perth requested epidemiological data concerning silicosis in the Transvaal, Kotze was able to refer the query only to Irvine and Macaulay.⁷⁵

The Transvaal medical profession's apathy towards the problem of silicosis contrasted starkly with its indignation at the "Lungsava business".⁷⁶ In 1908, as it had done in 1906,⁷⁷ the Transvaal Medical Council pressed charges against Stevens for unlawfully practising as a doctor, but it did not win the case as Stevens had already left the country.⁷⁸ The incident showed clearly that the Transvaal doctors' assertiveness in the matter was directed to promoting their professional standing rather than to protecting miners from fraudulent cures.

Many miners lacked the funds for the "melancholy pleasure" of returning home to die.⁷⁹ But both the state and the medical societies did the minimum for incapacitated miners who remained on the Rand. The mine benefit societies, to which the men were obliged to contribute, provided silicotic miners with hospital funding for only three months.⁸⁰ This was a bitter source of complaint to the Transvaal Miners' Association, which alleged that the management of the sick fund societies neglected "phthisical miners", but favoured sick mine officials by sending them to the coast, with all expenses paid, for "recuperative holidays".⁸¹ Some miners could not even avail themselves of the limited benefits that the sick benefit societies provided. They were obliged to work until their "death" because many mine managers refused to give them sick leave: such mine officials claimed that the miners' requests for sick leave were "merely

put up for malingering purposes".⁸²

The government medical institutions catered poorly for silicotic miners. The government hospitals were financed by levies of 1s deducted from the pass taxes paid by Africans.⁸³ They were run by management boards on which the Chamber of Mines was both officially and strongly represented.⁸⁴ The Johannesburg Hospital lacked the accommodation for patients with chronic illnesses, such as silicosis.⁸⁵ Also, it did not admit patients with infectious disease, including tuberculosis which frequently accompanied silicosis in its advanced form.⁸⁶ The Johannesburg Hospital admitted cases of tuberculosis only when the patients were "more or less in extremis".⁸⁷

The only hospitals that would accept silicotic miners were the Rietfontein government institutions, the lazaretto and the chronic sick home, which, were seven miles east of Johannesburg - a day's walk from the town.⁸⁸ The Rietfontein hospitals were established in 1903, to relieve the congestion in the Johannesburg Hospital. The chronic sick home accommodated patients suffering from "incurable diseases",⁸⁹ while the lazaretto admitted patients with infectious diseases and was the depot for plague and syphilitic cases.⁹⁰ The Rietfontein institution comprised "a collection of wood and iron shanties located anyhow on the veldt".⁹¹ As the medical profession acknowledged, the conditions at Rietfontein were "deplorable".⁹² Apart from the

appalling conditions at Rietfontein, miners shunned it because they disliked being treated, like most of the other patients, as "undesirables".⁹³

In 1904 Dr Catherine Arnott and her brother established a private sanatorium, nine miles from Johannesburg, on land which they leased from the government and which was adjacent to the dynamite factory at Modderfontein. On the property, called Springkell, stood an old disused hospital which had served the employees of the dynamite company in the pre-war years.⁹⁴ As miners could not afford to go to Springkell, in 1904 Arnott indicated to the Mine Managers' Association her willingness, in return for a subsidy from the industry, to accept twenty silicotic miners at reduced rates of £12 per month.⁹⁵ This fee was £8 less per month than the Johannesburg hospital charged for private patients.⁹⁶ The Association referred the request to the Chamber, which turned it down, despite acknowledging that "other hospitals" did "nothing" for silicotics.⁹⁷

To relieve the congestion at Rietfontein, caused partly by the ever-increasing number of silicosis sufferers, the government transferred a few silicotic patients to Springkell.⁹⁸ But in 1905, because of the "scandalous" conditions at Springkell, the government sent the patients back to Rietfontein, which "was now full to overflowing".⁹⁹ As important, because the sanatorium at Springkell was financially unviable without the government subsidy, in 1906 Arnott renewed

her offer to the Association of Mine Managers.¹⁰⁰

For several months, under pressure from the Association of Mine Managers, the Chamber toyed with the idea of subsidising Arnott and transforming Springkell into a home solely for silicotics: Springkell was to be the only health centre on the Witwatersrand where miners would receive treatment for the disease.¹⁰¹ Indeed, as mining house returns indicated, there would be no shortage of miners at a central institution devoted entirely to the treatment of the disease. In reply to a Chamber circular, seven of the nine mining houses indicated that a minimum of 489 miners per annum would avail themselves of the facility. This would remove from the mine hospitals the onus of treating on average 137,6 patients per month. The only exception was A. Goerz and Company which submitted that it could provide "nil" miners for a convalescent home.¹⁰² Apparently no miners who worked for this group suffered from silicosis.

Despite public expectations that "the controllers of the industry" could hardly fail to avail themselves of the opportunity now presented for the alleviation of "this distressing evil",¹⁰³ the mineowners did not give the scheme the "material support", which the Mine Managers' Association had anticipated. In December 1906 the Randlords rejected the scheme, giving bureaucratic obstacles as the reason for its decision: it wanted neither to supersede the functions of the Rand Provisional Joint Committee, responsible for the

establishment of hospitals, nor to contradict the committee's policy that private hospitals had to be "self-sustaining by means of patients".¹⁰⁴ In view of the Chamber's influence on the committee, such reasons were clearly spurious. It is more likely that the Chamber rejected the idea because the success of the scheme depended on the Randlords providing both considerable capital and maintenance costs.

Apart from their concern that handicapped miners should be able to "retire to a place for peaceful rest and cure", the mine managers favoured the establishment of a sanatorium so that miners who had silicosis "complicated" by tuberculosis would stop working "literally till their end comes".¹⁰⁵ Influenced by Irvine and Macaulay, who strongly advocated the precaution,¹⁰⁶ the mine managers wanted to prevent the "phthisical miners" from infecting their "healthy comrades" with the contagious disease.¹⁰⁷ In 1905 the West Australian Commission on the Ventilation and Sanitation of Mines had recommended the removal from work of tuberculous miners as a medical precaution against silicosis.¹⁰⁸

In March 1908 the Association of Mine Managers again petitioned the Chamber to provide a sanatorium for miners disabled by silicosis.¹⁰⁹ The Chamber agreed to consider the idea and asked the Association for a detailed scheme.¹¹⁰ The reason for the Chamber's volte face in 1908 was its acquisition of an unexpected windfall of £16 335. Consequently the

timing of the mine managers' request was singularly propitious.¹¹¹

At the beginning of the year Percy FitzPatrick had transferred to the President of the Chamber his trusteeship of the balance of the funds which the mineowners had contributed, before the war, to contest the MacArthur-Forrest patent for the cyanide process.¹¹² Originally the Chamber had ear-marked the trust fund for establishing a bacteriological laboratory.¹¹³ But as the government had its own laboratory, in 1908 the Chamber decided that the money should be spent on "some public object", at the discretion of the President of the Chamber.¹¹⁴

As the trust funds adequately covered the modest £13 000 capital costs, which the mine managers' scheme entailed,¹¹⁵ the executive of the Chamber approved the plan.¹¹⁶ But a stumbling block was the reluctance of Smuts, the Minister of the Interior, who was responsible for public health, to bear half the maintenance costs of the projected sanatorium. After more than a year of haggling with the Chamber, the government agreed to pay half the maintenance costs for the institution, in an amount not exceeding £5 000 per annum, and to provide the land free of charge.¹¹⁷ This was the limit of the government's commitment to "chronic pauper invalids".¹¹⁸

The Chamber did more than just "foot the whole bill".¹¹⁹ Perhaps from a sense of "blood

guiltiness",¹²⁰ it turned the modest sanatorium, envisaged by the Association of Mine Managers", into an extravaganza which, despite its opulence, catered for only seventy patients.¹²¹ After the mineowners had publicly committed themselves to the venture, they realised its importance as an exercise in public relations.¹²² Despite the resentment of the mine managers, responsible both for the idea and for initially eliciting government support, the Randlords jettisoned both the help of the mine managers and their original scheme.¹²³ Between 1910 and 1911 the mineowners lavished an additional £39 000 on the sanatorium,¹²⁴ its final cost being £52 000.¹²⁵ Admittedly many of the expenses incurred by the Chamber in re-building the sanatorium, were the result of government pressures.¹²⁶ Even so, the Randlords turned Springkell into a monument to commemorate their own self-importance and self-interest. Ironically Lionel Phillips, the President of the Chamber in 1908, whose discretionary powers had permitted the trust funds to be donated to Springkell, was one of the few mineowners who by 1913 had not bothered to visit the sanatorium.¹²⁷

Although high hopes for its success characterised the speeches at its official opening in November 1911,¹²⁸ the Springkell Sanatorium proved to be little more than a white elephant. Despite its seventy beds, from 1911 until 1917 the sanatorium treated on average only forty patients per day.¹²⁹ In the view of the

government and the industry, the concept of Springkell was "ideal": the sanatorium was both "elaborately" equipped and was situated near a lake and a hill which provided scenery with a "Scottish grandeur".¹³⁰ Even so, Springkell did not meet the needs of the miners who, when they had originally requested a home, had expressed different expectations:

If we had a hospital under Government to take such men from the mines, it would take a heavy load off many a household where the husband or wage-earner is dying of phthisis.¹³¹

Clearly the miners, who had not been in any way consulted about the Springkell project, wanted a hospital that was accessible to Johannesburg and which provided conventional medical services and care.

The miners also shunned Springkell because of its remoteness, as a newspaper article explained:

This horror of isolation when death is only a matter of months is so pronounced with some of the miners that they will do anything to avoid it.¹³²

"Let me rather die in the street", was the response of a miner to whom the facilities of Springkell were offered.¹³³ Another reason for the miners' dislike of Springkell was its morbidity. Because most Springkell patients died, miners could not view it as a sanatorium, as its name denoted. "There is not much recreation," said Eudewyn de Witt Hamer, the Secretary to the Miners' Phthisis Board, "in seeing a funeral twice a week."¹³⁴

More important, the miners regarded the Randlords' gesture of providing them with a sanatorium as only a palliative. They wanted the controllers of the industry to spend money on eliminating the disease. "One wheezing miner" said: "We want to live, not to be carted out to any palace [Springkall] to die like sheep."¹³⁵

But the miners' wishes to stay alive were fruitless. From 1903 to 1910 they continued to die in ever-increasing numbers in the "phthisis stricken" districts of the Reef.¹³⁶ The "sorrowful sights" at the offices of the Transvaal Miners' Association, which had distressed the visitor to Johannesburg, testified to the serious mortality amongst miners, "all" of whom were "steady men".¹³⁷ Tom Mathews's visitor wrote:

My eyes turned to the wall on my right, and then I saw it was placarded with "subscription sheets or lists" for and on behalf of women and fatherless children.¹³⁸

During the period 1903 to 1911, before compensation had been made compulsory by law, the mineowners, according to a "comprehensive list prepared by the Chamber of Mines itself", contributed a mere £4 000 to disabled miners and their dependents "on their own initiative".¹³⁹ The sum was "distributed amongst 90 odd miners and their dependents".¹⁴⁰ But as Wilfred Wybergh, the former Commissioner of Mines and subsequently a prominent member of the South African

Labour Party, pointed out:

In some cases comparatively large sums had been given amounting to several hundreds of pounds, so that the average given per case was something very small indeed.¹⁴¹

After the report of the Mining Regulations Commission had been published in August 1910, members of Het Volk's ministry and the Randlords "protested their ignorance as loudly as ever" of the toll that silicosis had taken.¹⁴² Such arguments were clearly spurious. Apart from all the other first-hand information both parties possessed on the ravages of the disease, in 1908 the Transvaal parliamentary debates concerning workmen's compensation had brought to the fore the problem of silicosis and the question of its inclusion under the new act.¹⁴³ Indeed, in advocating that silicosis be scheduled as a compensatable disease under the act, John Ware, the President of the Witwatersrand Trades and Labour Council, had declared dramatically to the Mining Industry Commission that if the miner "goes on working underground he is murdering himself".¹⁴⁴

At virtually every meeting of the Transvaal Miners' Association there were collection boxes for victims of the "white death".¹⁴⁵ Contrary to both contemporary and current popular belief,¹⁴⁶ the miners on the Witwatersrand, unlike the craftsmen,¹⁴⁷ were not apathetic towards trade unionism. Nor was their union weak and badly organised.¹⁴⁸ The strength and growth of the Transvaal Miners' Association were all

the more remarkable in view of the mortality from silicosis amongst its executive members:¹⁴⁹ they were "generally killed off" by the disease "just as they were entering upon their period of full maturity and therefore usefulness".¹⁵⁰ By 1909 the "dozen" men, who had comprised the first stable executive committee in 1904, had died.¹⁵¹ Similarly, the fate of the 1905 executive committee was morbid: of the 1905 eight-man committee, by 1911 six had died from silicosis and two had the disease in an advanced stage.¹⁵²

After its shaky start and initial growing pains, by 1906 the Transvaal Miners' Association had developed into a strong and well supported organisation. By the end of 1906 the union could afford to pay for the services of a general secretary-organiser and three district organisers.¹⁵³ As these salaried officials were paid out of union funds, which derived from membership subscriptions, the Association had an extremely large membership. Clearly at the beginning of the 1907 strike the Transvaal Miners' Association did not consist of a mere 300 members, as Gitsham and Trembath incorrectly claim.¹⁵⁴ Indeed, Thomas Mathews did not exaggerate when he told the Mining Industry Commission that in May 1907 his union had 3 800 paid-up members.¹⁵⁵

Between June 1907 and June 1910 the membership of the union dwindled. In 1908 the union dispensed with the services of the three district organisers and retained only one salaried post, that of the

secretary-organiser.¹⁵⁶ In 1910 the Transvaal Miners' Association consisted of approximately 1 800 members.¹⁵⁷ As locally trained miners, who "were very largely...African-born men of both Dutch and English descent",¹⁵⁸ did not join the union,¹⁵⁹ the reason for the decrease in membership is obvious - the "white death". Although reduced wages and revised contract prices, introduced by management after the strike, caused approximately 800 professional miners to return to Britain and Australia,¹⁶⁰ most of the 1 200 miners, who were no longer members of the union, had been disabled or had died from silicosis.

As we have seen, from 1910 onwards the most popular nickname for silicosis was the "white death".¹⁶¹ This was an ironic term because the conventional wisdom, guided by the views of the medical profession, held that silicosis was a serious problem only for white miners and not for Africans. In evidence to the Mining Regulations Commission in 1907, Louis Irvine explained: "True miners' phthisis, in the sense of non-infective fibrosis of the lungs, is less common amongst the native mine workers than might be supposed."¹⁶²

For the period 1902 to 1914 there are no epidemiological data on the prevalence of silicosis amongst African mineworkers. The Weldon Commission had discretionary powers to investigate the prevalence of the disease amongst black mineworkers. Despite the injunction of W. S. Caine, the House of Commons

representative for Camborne, that the commission appointed by Milner should investigate the mortality of the disease amongst "native miners", the Weidon Commission failed to do so.¹⁶³ The commission's token gesture to Caine's mandate was the provision of an appendix to the report. The appendix consisted of a survey from August 1902 to April 1903 conducted by H. [Emil] Rosenberg, the medical officer for the Lancaster West. Rosenberg diagnosed five cases of silicosis amongst the Africans on his mine. Three of the patients died whilst under his care and the two survivors returned to their rural homesteads.¹⁶⁴ In 1912 under the chairmanship of the Medical Inspector of Mines, Sebastian Valentyn van Niekerk, the Commission on Miners' Phthisis and Pulmonary Tuberculosis, also known as the Medical Commission, did not investigate the prevalence of the disease amongst African mineworkers, "because the terms of reference did not permit [it] to do so".¹⁶⁵

As we have seen, in January 1903 Milner instructed the industry and the Native Affairs Department to include in the mortality returns of the gold mines the number of deaths from each disease amongst African mineworkers.¹⁶⁶ For the year 1903 these new statistics showed that respiratory diseases were responsible for 58,34 per cent of the total death rate. Pneumonia and pulmonary tuberculosis were the most serious lung diseases; they accounted for 50,83 and 5,40 per cent of the deaths from all causes.¹⁶⁷ By

1912, although the mortality from pneumonia (excluding those Africans who came from territories north of Latitude 22° South) had decreased to 40,25 per cent of the total death rate, the mortality from tuberculosis had increased to 23,97 per cent.¹⁶⁸ As we shall show later, these figures are significant to our study of silicosis amongst Africans.

In contrast to the high mortality from pneumonia and pulmonary tuberculosis, the official death-rate statistics for silicosis showed that the disease amongst Africans was apparently an insignificant problem: in 1903 the annual death rate from "other respiratory diseases", including silicosis, was 2,11 per cent;¹⁶⁹ and in 1912, at 1,88 per cent, this category of disease was virtually unchanged.¹⁷⁰ According to Richard Barry in 1912, the information regarding "Natives and [Miners'] Phthisis...is very scant and not too reliable". He "believed" that the prevalence from the disease was 12 per thousand per annum. This figure was consonant with official mortality statistics for the disease. Throughout the period 1902 to 1912 "other respiratory diseases", including silicosis, accounted for approximately 2 per cent of the total annual death rate.¹⁷¹

As the official figures are an unreliable index of the prevalence of and mortality from silicosis amongst Africans, we must explore informal data. In the absence of Africans' evidence concerning their experiences of the disease, we must rely largely on

doctors' observations and studies. In this respect, the 1914 MD thesis of van Niekerk is an invaluable source.

Before the Anglo-Boer War, as we have noted, African mineworkers, particularly those from Portuguese East Africa, south of Latitude 22 South - the "East Coasters" - spent on average two to six years on the mines. As they shared the same conditions as the overseas professional miners and were, therefore, exposed to high dust densities for a continuous period of time, such Africans undoubtedly contracted accelerated silicosis. Although scanty, the evidence of rural merchants, such as Lionel Cohen, confirms this. In evidence to the 1903 Labour Commission, which investigated the shortage of African mineworkers, Cohen stated:

He [the native] shivers to-day at the idea of the cold morning in the compound and talks with his fellows about the "m-lugu 'tgate" - the witchcraft of the white man - which has led to the death of many of his brothers on the mines.¹⁷²

Cohen's later observations, however, were more significant:

[There is] a new terror of recent years, from which others of his tribe return, prematurely aged, often with incipient paralysis and the wreck of their former selves.¹⁷³

Clearly the "new terror" amongst Africans, to which Cohen referred, was progressive massive fibrosis. Like the two survivors in Emil Rosenberg's survey, appended to the Weldon Commission report

African mineworkers, who had been disabled by lung disease, which they had contracted on the mines, returned home to die. Indeed, in evidence to the Waldon Commission, Louis Irvine agreed with one of the commissioners, Dr S. Hawarden, that during the war the "tremendous mortality in their kraals" of Africans from silicosis had after 1901 resulted in "very few of the old stock of boys" returning to the mines.¹⁷⁴ Also, in 1907 Thomas Mathews recalled that pre-war African mineworkers died of silicosis on the mines:

I have had Kaffirs here before the war who died of phthisis. They came underground to me at the last stage and died on the property.¹⁷⁵

Between 1902 and 1906 each of the handful of doctors who showed an interest in the occupational disease reminded the public that Africans were vulnerable to silicosis.¹⁷⁶ Amongst these warnings those of the Haldane Commission and of Sir Thomas Oliver were prominent.¹⁷⁷ Both Oliver and Charles Lane Sanson, the Witwatersrand Medical Officer of Health, were concerned that the Chinese indentured labourers would contract the disease unless adequate precautions were taken.¹⁷⁸ In alerting the government to the vulnerability of the Chinese to silicosis, Sanson provided the analogy of the African mineworkers:

I may remark that I have seen and know of a large number of Natives affected by silicosis and these Natives work only a comparatively short time on the Mines. Unless steps are taken to protect the Chinese miners, I fear that there is a reasonable chance of a very considerable mortality amongst them during the latter part of their [three-year] contract in this

In 1902 to 1903 many Witwatersrand health officers, including Irvine and Macaulay, conceded that long-service Africans, who worked underground, contracted a rapidly progressive form of silicosis.¹⁸⁰ But unlike Sansom and the British doctors, they denied that short-term exposure to high dust densities could cause an incapacitating and fatal fibrosis. For instance, Irvine suggested that African rock drillers, who were "stationed" to the machines in constant contact with the dust, were prone to the disease in a shorter time than their white supervisors. Even so, he did not believe that the African migrant workers, most of whom worked for relatively short intermittent contracts,¹⁸¹ could develop a disabling form of silicosis within their short periods of service.¹⁸² The doctors had no scientific grounds for their theory, which they based solely on observation. In brief, mine doctors made the unfounded assumption that the Africans' spells of rest at home between intermittent contracts were sufficient to abort the development of the fibrosis and to "restore" the health of the workers.¹⁸³

In 1906 the findings of George Turner junior, the medical officer for the WNLA and the son of the Transvaal Medical Officer of Health, gave the theory unwarranted substance. At this time new criticisms of the industry's health practices perturbed the mineowners. Health authorities in the British South African territories contended that the mines were

sending home silicotic and tuberculous mineworkers, who were infecting with "phthisis" the rural Africans, who had formerly been free of the malady.¹⁸⁴ These allegations prompted the mineowners to send Turner on a fact-finding mission to Portuguese East Africa south of Latitude 22° South.

After spending a month inspecting medical institutions and consulting with doctors in Lourenço Marques, Turner travelled extensively in the countryside visiting as many African homesteads as possible to detect cases of tuberculosis. During the three-month tour, where he encamped at thirty-three sites, he diagnosed physically, and without the aid of tuberculin tests, only fourteen cases of tuberculosis.¹⁸⁵ He therefore concluded:

I think these facts prove that Pulmonary Tuberculosis is comparatively rare in the kraals, and it is a disease that is certainly not being spread throughout the country by labourers returning to the East Coast from the mines.¹⁸⁶

As important, eight of the fourteen cases of tuberculosis identified by Turner had definite signs of silicosis. All eight African males had, however, an occupational history of long service on the mines.¹⁸⁷ Not surprisingly, Turner concluded that silicosis was "not prevalent" in this Portuguese territory. Of greater significance was his rider to

the conclusion:

Short Period of Service.

The short period which the boys stay on the mines at a time is their chief safe-guard. In the days before there was a railway to Johannesburg, and the boys had to walk here, they appear to have stayed on the mines working as hammer boys, etc., for much longer periods at a stretch, and they therefore, undoubtedly contracted the disease much more commonly than they do now.

The diagnosis of Silicosis is at all times a matter of some difficulty, but had it been prevalent in the districts I travelled through, I should surely have been able to recognise a certain number of cases...

Post Mortem Examinations.

Again, if there were a number of boys with the disease developed only to a slight extent, it would not prevent them offering themselves as recruits for the mines, and one would expect such boys to break down shortly after arrival here. The disease would then be readily recognised at the post mortem examinations held here. But we find that of 174 post mortem examinations held on boys of all tribes in the W.N.L.A. Compound, in nine only was Silicosis demonstrated. Of these four actually died of the disease...Of the 174 patients, we hold records showing that 90 had been working on the mines. Of the remainder, [84], the majority certainly were fresh recruits, but for various reasons the records were in many cases difficult to obtain, and I have no doubt that more than 90 of them had worked on mines before.¹⁸⁸

There were many glaring weaknesses in Turner's conclusions, particularly those with reference to the section headed "Post Mortem Examinations". We shall note three. First, as we have earlier seen, when we quoted Girdwood's description of the examinations of

new recruits, as late as 1930 medical officers at the WNLA superficially checked the Africans physically at the rate of approximately sixty an hour.¹⁸⁹ As in 1930, in 1906, when the medical examinations at the WNLA compound were presumably even more perfunctory than they were later, it must have been virtually impossible for health officers to detect silicosis in new recruits: working under prime conditions doctors confessed that they had difficulty in diagnosing the disease.

Second, post mortem examinations were by no means the rule at the WNLA, as Turner implied. The British Crown Colony administration had abolished its own inquest law which had made post mortems compulsory for mineworkers.¹⁹⁰ Consequently the official mortality statistics for silicosis, which were based largely on post mortem examinations, seriously under-estimated the death rate from the disease.

Finally, although Turner acknowledged that the employee records of the WNLA were in a deplorable state, he indicated that medical officers did not require them. Neither the WNLA nor the mining houses viewed employee records listing occupational data as being necessary. Indeed, had the mineowners wished to establish scientifically the validity of Turner's theory that short periods of service safeguarded Africans from developing silicosis in a disabling and deadly form, it was essential for them to access and study occupational histories of their black

employees.

Not surprisingly, the Randlords were delighted with Turner's findings. In fact, they published his report immediately and actively promoted the theory that short contracts prevented migrant workers from contracting a serious form of silicosis. The mineowners' propaganda was so successful that the medical profession, the government and the public accepted as a scientifically established truth a subjective theory which had little, if any, substance.¹⁹¹ Indeed, the mineowners helped transform Turner's findings into an orthodoxy. The theory held such strong sway that for more than a decade it inhibited, if not terminated, original medical research on the incidence of the disease amongst Africans.

As important, Turner's theory that rest periods in their rural homesteads protected Africans from silicosis became an important rationale used by the mineowners to perpetuate the migrant labour system. Randall Packard makes a similar judgement with respect to tuberculosis.¹⁹² Packard wrote recently: "In effect, preventing the spread of tuberculosis became a medical rationale for the use of migrant labour."¹⁹³ Even so, the evidence for the judgement seems to be stronger in the case of silicosis than in the uncomplicated form of tuberculosis, to which Packard solely refers. As late as 1937 a government publication, *The Prevention of Silicosis on the Mines*

of the Witwatersrand, bruited the migrant labour system as an important "preventative" against the incidence of "simple" silicosis amongst Africans:

Partly owing to such intermissions of service, and partly owing to the related fact that the total cumulative service of the native labourer is in general of much shorter duration than that of the European miner, the incidence of uncomplicated silicosis is very much decidedly lower in the native than in the European labour force.¹⁹⁴

In view of the medical commitment to Turner's orthodoxy in 1937, it is scarcely surprising that in 1907 Irvine and Macaulay, the two acknowledged medical experts on silicosis in the Transvaal, expressed the conventional line of thought dogmatically. With reference to Turner, Irvine explained to the Mining Regulations Commission why "true miners' phthisis in the sense of non-infective fibrosis of the lungs, is less common amongst the native mine workers than might be supposed". He added:

But true miners' phthisis is not uncommonly seen amongst boys who have spent several years continuously on underground work. In such cases *post-mortem* evidence of superimposed tuberculosis is usually found.¹⁹⁵

Turner's findings were also reassuring with regard to the indentured Chinese labourers. After 1906 Sansom, like other health officers, no longer regarded the Chinese as being at risk from silicosis. In 1913 Turner recalled: "The Chinese contracted for three years and Miners' Phthisis was not a great factor with them."¹⁹⁶ Indeed, the Chinese proved to be

extraordinarily resilient to the poor health conditions on the mines. They enjoyed "good health";¹⁹⁷ and in 1908 the death rate amongst them of 6,788 per thousand was nearly five times less than that of the African mineworkers, which was 31,061 per thousand.¹⁹⁸ The contracts of the Chinese were for only three years and by the time of the repatriation of the final group in 1910 not one of the Chinese labourers had served more than one period of indenture: all who had had the option to renew their contracts had refused to do so.¹⁹⁹

In 1908 when Sir Thomas Oliver published a major study, *The Diseases of Occupation*, he accepted the conventional wisdom of the Witwatersrand medical profession concerning the protective mechanism of the contract system in safeguarding the health of African workers:

There is one circumstance which ought to diminish the liability of the "boys" to the malady, and that is that kaffirs do not follow the occupation with the same constancy or as long as the white men.²⁰⁰

Even so, for reasons which he explained, Oliver was far less sanguine about the Chinese:

At the time of writing no case of miners' phthisis has been recorded among the Chinese, but this is to be expected for the work in the mines has to be carried on a few years before the disease develops. There is not the least doubt that within the next five or six years many Chinese, after their return home, will die of pulmonary disease, the result of the inhalation of the rock dust of the Transvaal mines.²⁰¹

Although some Witwatersrand doctors undoubtedly had certain misgivings about the apparent infallibility of Turner's theories they did not challenge them publicly. They suppressed their former misgivings that silicosis amongst Africans was higher than the official figures indicated. In evidence to numerous commissions G. V. van Niekerk, the Medical Inspector of Mines, appointed in 1911, also proved to be a conformist. This attitude must have disappointed the Government Mining Engineer, R. N. Kotze. He had high hopes that the Medical Inspector of Mines, in contrast to the mine doctors, would not be "afraid to make too much fuss about the health conditions on the mines".²⁰² In 1908, in a letter to the Minister of Mines,²⁰³ the Mining Regulations Commission had recommended the creation of the medical post to fill the gap caused by Smuts's decision to abolish many important public health offices. Smuts's policy of rationalising the health services resulted in the abolition of the Witwatersrand Medical Officer of Health, the position which Sansom had held.²⁰⁴

As in public, so with his doctoral research project, entitled "Miners' Phthisis on the Witwatersrand", van Niekerk conformed largely to accepted medical opinion. He used his case material on white miners solely to substantiate the findings of the 1912 Medical Commission, which he had chaired. But as the Medical Commission had not investigated the prevalence of and mortality of the disease amongst

Africans, van Niekerk's research therefore fills an important gap. Consequently this study focuses on his thesis material concerning African mineworkers.

In terms of the 1912 Miners' Phthisis Act, van Niekerk : Medical Inspector to the Native Affairs Department, an additional duty conferred on him in 1912, was responsible for examining African applicants for compensation.²⁰⁵ Initially there were very few African applicants.²⁰⁶ Consequently van Niekerk's sample, which comprised twenty-four African mineworkers suffering from silicosis, is tiny. Even so, his survey is important because of the trends it indicated. Van Niekerk's purpose in using the case material was to establish and to validate his medical and epidemiological hypotheses. He therefore paid no attention to demographic trends. Nonetheless, the impact of silicosis had significant features concerning the territorial composition of the African labour force. This study therefore explores the demographic patterns inherent in the case material, so making good van Niekerk's omission to do so.

From his sample Van Niekerk, with the aid of X-rays, diagnosed three kinds of fibrotic conditions for which he devised his own terms. In van Niekerk's view four were cases of "acute miners' phthisis with complications", four were examples of "extraordinary chronic miners' phthisis" and the remaining sixteen were instances of "ordinary miners' phthisis".

We shall deal with the sixteen "ordinary" types first. Van Niekerk diagnosed fourteen of them as having either "marked" or "advanced" fibrosis; and survival was his prognosis for only two of the men. Also, all the patients were long-service Africans with periods ranging from three to twelve years. Although the average period of service, was six and a half years, the commonest period was only four years. Not surprisingly, of the ten rock drillers, six had worked for only four years. The average working life of the five hand drillers was a mere six years; van Niekerk expected four of them to die within the year. Clearly, as van Niekerk concluded, African hand drillers were as prone to accelerated silicosis as were African rock drillers.²⁰⁷

This conclusion was at variance with the findings of the Medical Commission, which reported that white hand drill supervisors were less prone to accelerated silicosis than white rock drill supervisors. It is likely that African hand drillers who worked in far closer proximity to the dust than their white supervisors were more vulnerable to the disease than their overseers. Even so, the trend amongst Africans confirms the impressionistic evidence of the white miners that hand drill supervisors succumbed in large numbers to a rapidly progressive form of the "white death".

Finally, this group indicates a significant demographic trend. Twelve of the patients, or 75 per

cent, were "East Coasters" who came from the Portuguese East Coast south of Latitude 22° South. Clearly most of the long-service Africans on the mines came from this territory.²⁰⁸

The other two groups indicate only a few significant trends for purposes of this study. But both groups are too small to support the drawing of valid conclusions. The four cases with the "extraordinary chronic" type of silicosis had periods of service ranging from eleven to twenty-two years. None had any sign of tuberculosis. Three of the four were "East Coasters"; and van Niekerk expected two of them to die.²⁰⁹

The data on the four patients with the "acute type of miners' phthisis with complications" indicate two important trends. First, all had only two and a half years of service in a variety of occupations. Second, and more important, all had "marked miners' phthisis with tuberculosis".²¹⁰ As we shall see later, when we discuss van Niekerk's conclusions on the mortality statistics from the disease amongst Africans, the significance of this finding did not entirely escape the Medical Inspector of Mines. In fact, it upset his preconceived conviction that no African with less than three years' dust exposure could "suffer" from silicosis.²¹¹ Even so, he did not conclude, as certain current medical scientists do, that an initial dust-laden lung reduces significantly the lungs' resistance to invasion by the tubercule

bacillus, so causing the onset of progressive massive fibrosis.²¹²

Following the conventional wisdom, van Niekerk concluded that incapacitating silicosis occurred only in long-service Africans; contract workers would be restored to health by "rests" at their "kraals". Van Niekerk subscribed to the view that the simple silicosis contracted by migrant workers would not harm them. Even so, as his comments to his professors indicate, van Niekerk, unlike his medical colleagues, was not afraid to express the view that there was an extremely high prevalence of simple silicosis amongst African contract workers:

I have been on several occasions asked to investigate the incidence of Miners' Phthisis amongst the natives, but have always been averse to doing so; in the first place, large numbers would have to be repatriated at one time, and the set-back to the Mining industry, owing to the temporary shortage of labour, would be very serious; and secondly, no advantage would be gained by the Natives or anyone else.²¹³

In 1914 amongst African mineworkers the official percentage death rates per month for pneumonia, pulmonary tuberculosis and miners' phthisis were 3,6, 1,33 and 0,8.²¹⁴ Unlike most of the medical fraternity on the Witwatersrand, van Niekerk had grave misgivings about the reliability of the mortality statistics for silicosis. In his thesis he therefore expressed this concern:

The small death rate from Miners' Phthisis...is misleading if taken as an index to the ravages caused by this disease; the explanation being that, whenever a native is

diagnosed as suffering from Miners' Phthisis he receives compensation and is repatriated. Those all die in their own country, where no records are kept of the causes of death. Those whose deaths are recorded [in the official statistics] have succumbed to the disease in the Transvaal owing to their being too ill for repatriation.²¹⁵

As in the past, before Africans had been the recipients of compensation, at least one-half of black silicotic sufferers died at their homes.²¹⁶ Many sick Africans left the mines voluntarily as "deserters";²¹⁷ they detested the poor quality mine hospitals and the treatment they received.²¹⁸ Also, management "shunted" most of its ill and dying black employees to their rural homesteads so that their deaths would not be reflected in the records of the industry.²¹⁹

In van Niekerk's view, pneumonia, pulmonary tuberculosis and silicosis were "interdependent". He therefore asserted that many deaths which doctors attributed to pneumonia and "especially Pulmonary Tuberculosis" were, in fact, linked strongly to silicosis. According to van Niekerk this was another important reason that the official death-rate statistics for silicosis were too low.²²⁰ His findings with respect to the cases he named "acute silicosis with complications" provided important pointers for the conclusion. As we have seen, these patients contracted "marked miners' phthisis with tuberculosis" in less than three years of service.

Van Niekerk's opinion that the respiratory diseases were linked to each other did not find support amongst the local medical fraternity. Experts

on the disease, including Irvine, Macaulay and Andrew Watt, maintained that Africans, in contrast to whites, often developed a handicapping form of silicosis in which the fibrosis was "early or "moderate", but the tuberculosis was "preponderant".²²¹ From this they concluded that the "high susceptibility" of Africans to tuberculosis "forestalled the effect of the tardier process", namely fibrotic development.²²² In their view, tuberculosis, but not silicosis, was the cause of death. In brief, most Witwatersrand doctors were unwilling to believe that Africans, whose lungs had been damaged by dust, had a reduced resistance to pulmonary infection, particularly to tuberculosis.

From the evidence it is clear that we can make few definitive assertions concerning the prevalence of and mortality from silicosis amongst Africans during the period 1903 to 1914. We can, however, conclude with certainty that there was a high prevalence of simple silicosis amongst contract workers. We can only assume tentatively that a handicapping form of the disease developed in those migrants who undertook repeated contracts. If this assumption is correct, there are strong grounds for asserting that the prevalence of a disabling and fatal form of the disease was highest amongst the "East Coasters".

There are three premises which favour the argument.²²³ First, in contrast to most Africans from British South Africa, these Portuguese Africans were "not averse" to underground work. In 1913, although

the "East Coasters" comprised approximately one-third of the total black workforce on the mines,²²⁴ "they formed no less than one-half of the labour employed *underground* on the mines". Second, as they renewed their contracts repeatedly, they were exposed to dust more often than their British South African counterparts. In 1913 77 per cent of the "East Coasters", who were "accustomed" to working "on the Rand for many years", were "old mine boys".²²⁵ Finally, their relatively lengthy spells of work, which averaged eighteen months at "any one-time", exposed them to dust doses which were three times more prolonged than those of other African mineworkers who "spent at a stretch" periods from only six to eight months. It is therefore ironic that the black migrant workers who might possibly have been the most vulnerable to a disabling, if not fatal, form of silicosis were the "foreign" indentured Africans whom management considered to be "the most valuable portion of the unskilled labour force for work underground in these mines".²²⁶

Long-service Africans, like their white counterparts in similar occupations, undoubtedly contracted a rapidly progressive form of silicosis. But the evidence strongly indicates that the official statistics for the mortality from silicosis are totally unreliable. The true prevalence of and mortality from silicosis amongst long-service Africans, most of whom also came from the Portuguese

east coast south of Latitude 22° South, were at least double, if not treble, those listed in the official records. The gloomy summation in 1908 of Sir Thomas Oliver holds good both for the period about which he was speaking and for at least another decade:

While comparatively easy to obtain statistics relating to Rand miners' phthisis among White men, it has been difficult until lately to know how the disease has affected the Kaffirs, since many of them on becoming ill return to their kraals, where they die often unknown and unheeded by the employers.²²⁷

There is evidence, even if scanty, which indicates that African mineworkers' were aware of the threat to their health of the "white death". Impressionistic material suggests that one reason that black mineworkers withheld their labour from the gold mines immediately after the Anglo-Boer War was the high mortality amongst them from disease. Although most commentators assumed that the resistance was directed to the prevalence of disease in general rather than to any specific illness,²²⁸ the *Cornubian* noted the Africans' particular concern with silicosis. In 1903 it stated:

Even among those of the kaffirs employed in assisting the rock-driller the mortality from the same complaint [silicosis] is high, and that is one of the causes of their refusal to work in the mines. They know that going underground would mean, so far as they were concerned, a short life, and anything but a merry one. Therefore they make themselves scarce, and who could blame them for so doing? The mineowners must either devise improved methods of working the rock-drills, or dig the gold out of the hills themselves - if they are determined to have it.²²⁹

By 1911 many Africans were certainly alive to the risk to their health of dust. The injunctions of white rock drill supervisors that Africans use water as a dust precaution reinforced their awareness of the hazard to their health.²³⁰ According to Lionel Phillips, in response to their fear of contracting silicosis many Africans showed a distinct form of resistance to management. Black mineworkers moved from mine to mine in search of hand stoping jobs in preference to remaining on a mine where they were obliged to do machine drilling.²³¹ Even so, the knowledge of their vulnerability to disease in general, and to silicosis in particular, did not provoke in Africans a spirit of militancy, which was markedly evident in white miners.²³²

From December 1905 onward the policies of the mineowners provided the impetus for a renewed militancy, dormant since 1902, amongst the white miners. The miners were dissatisfied with management's changes in their working conditions. Such changes both affected the miners' wages and stimulated the miners' fears that increased competition from Africans - and the Chinese - would reduce their job opportunities. The ravages of silicosis reinforced their insecurity. Indeed, the devastation wrought by the "white death" provided the catalyst for miner militancy which, in 1906, the increased strength and size of the Transvaal Miners' Association reflected.

As we have seen, in 1905 the mineowners were experiencing a financial depression of great magnitude. The depression, which had begun in 1903, when many overseas investors had turned their backs on the industry,²³³ had by 1905 assumed severe proportions. Also, as the price of gold remained fixed, the Randlords found it extremely difficult to make the same handsome profits as they had done in the pre-war years, the more particularly as they were now mining ores of lower grades.²³⁴ In the mineowners' view, an important solution to their financial problems was the reduction of working costs. By 1905 the mineowners had succeeded in paring surface costs to the bare minimum.²³⁵ But underground working costs still remained high. Since the war management had been able to reduce underground working costs by only 6d per ton.²³⁶ Consequently at the end of 1905, by which time the industry had, in the mineowners' view, an adequate complement of Chinese and African labour, the industrialists launched a concerted operation to drive down working costs. In trying to achieve this objective they focused their energies on increasing the productivity of the white miners. These efforts did not include the artisans.²³⁷

The mineowners believed that the only real solution to white wage costs was the absolute reduction of the money wages of supervisors and the prices of contractors. This was their ultimate ambition.²³⁸ This ambition explains why the Corner

House directors were keen to introduce training schemes for miners who were born in South Africa. The mineowners believed that Afrikaner skilled miners would be prepared to accept lower wages than the overseas miners.²³⁹

In 1906 the local directors of the Corner House were obliged to shelve temporarily the radical expedient of lowering all round the wages of miners and the prices of contractors, in case such a move would alienate the English-speaking electorate. The overseas directors "in Beit's room" had authorised the local directors "not to do anything" [about absolute wage reductions] until the "elections [for Responsible Government] are over".²⁴⁰ This was the policy that the local directors were obliged to defer. The local directors had no directive from the overseas board, as Karen Thorpe incorrectly argues, to postpone their productivity drive, which included increased rock drill supervision.²⁴¹

In April 1906 the receipt by the Corner House of the report of the overseas consulting mining engineer, Ross E. Browne, confirmed the unanimous opinion of the directors that the white supervisors were not providing an "efficient service" which was commensurate with their wages.²⁴² Commissioned by the Corner House, Browne had spent twenty months on the Reef, from January 1904 to September 1905, investigating the "Working Costs of Mines of the Witwatersrand".²⁴³ Browne made a variety of

recommendations. But the one that the mineowners thought would best suit their present difficulties was Browne's suggestion that the productivity of supervisors, whether they worked on day's pay or under contract, should be increased considerably, but at the same rates of pay that the supervisors were then presently receiving.²⁴⁴ Although the Corner House decided to defer both publication and informal discussion of Browne's report,²⁴⁵ the local directors nevertheless agreed to implement Browne's recommendation that the productivity of supervisors be increased.²⁴⁶

The Chamber immediately launched a propaganda campaign to convince the public that the supervisors were inefficient. The *South African Mines, Commerce and Industries*, the leading local mining journal, initiated the campaign by publishing a series of articles demonstrating that the overseas miners were incompetent but overpaid and lazy supervisors.²⁴⁷ Indeed, the title of one of the first editorials on the subject was, "The Inflation of Working Costs by Inefficient Labour".²⁴⁸ The journals and the newspapers succeeded in convincing the public that the miners' co-operation would enable the industry to reduce its working costs, so benefiting the entire community. Without quoting Browne, they expressed his

sentiments:²⁴⁹

To the shareholders of the operating mines it means doubling the dividends.

To the owners of undeveloped properties it means a great increase of present value.

To the community at large it means a great increase in the output and rapid rise in prosperity.²⁵⁰

Consequently, when the miners resisted management's attempts to increase their supervision loads without an accompanying increase in pay, not surprisingly, they had little, if any, public support. Convinced by the Chamber's propaganda, the public agreed that the miner deliberately "begrudged his best services to his employers".²⁵¹ As we shall see, a great deal of the miners' opposition to management's innovations stemmed from their fear that increased supervision would result in heightening their exposure to dust, so increasing their vulnerability to the "white death". But the press organs of the mineowners, did not present the miners' case impartially. In fact, the press was careful to avoid mentioning the miners' increased dread of silicosis. This was an important reason that the miners went on strike on the Crown Deep in October 1906, when management compelled them to supervise three instead of two machines.²⁵²

The report by the local mining journal on the miners' successful strike on the Crown Deep, a Corner House holding, was so biased that it caused the public to believe incorrectly that the miners were being

deliberately obstructive. The editorial stated:

The miner here expects, as we have said before, something more than a day's pay for less than half a day's work, and as soon as it is suggested to him that further effort is due to his employer he is enormously impressed with the unreasonableness of the request, and prepared to resist it at all costs.²⁵³

In view of this sort of propaganda it is scarcely surprising that the industry-wide miners' strike of 1907 evoked little, if any, local public sympathy. Its main support derived from local workmen and from newspaper coverage in Britain, particularly in Cornwall.²⁵⁴

The Corner House launched its productivity drive in June 1906.²⁵⁵ Management agreed to risk the possibility of strikes and introduced the supervision of three drills on a number of its properties, including the Crown Deep.²⁵⁶ This study has amply demonstrated that miners resisted the three-drill system because they believed it heightened their vulnerability to silicosis; they wanted danger pay as compensation for the increased work and risk. Even so, it must be stressed that miners had other reasons for objecting to the three-drill system. Correctly they viewed the innovation as being indicative of the industry's aim to employ fewer white miners. As skilled workers, whose jobs had been fragmented, the overseas miners feared the encroachment of lesser-skilled men, the African and Chinese mineworkers, against whose competition the colour bar

afforded little, if any, protection.

The public statements of George Albu, Chairman of the General Mining and Finance Corporation, reinforced the miners' fears that the mineowners intended opposing the colour bar in order to place Africans in skilled positions. In 1907, at a time when the mineowners knew that the repatriation of the Chinese labourers was a foregone conclusion,²⁵⁷ Albu expressed the conviction that many African underground mineworkers possessed the necessary skills to do the work formerly done by the professional miners:

[In 1902] We had to teach the natives to do the unskilled labour, and in order to teach them we had to employ a large number of white men. Gradually our managers gained more experience and came to the conclusion that they had far too many white men underground, whom they could not possibly employ, and who, instead of doing nine hour's work, did two hour's work a day. They had too many white men underground.²⁵⁸

Such sentiments aroused the fears not only of those rock drillers who were subjected to the three-drill system in both development and production. Albu's views also created anxiety amongst supervisors of hand drillers who were also the target of the efficiency drives in the stopes.

The miners did not know, however, that Albu's views, which threatened to dismantle the colour bar, were idiosyncratic. Most of the mineowners, including the directors of the strongest group, the Corner House, had no such intentions. Most Witwatersrand industrialists, subscribed to the philosophy of Social

Darwinism, which the report of Ross E. Browne epitomised. In the same way that the Randlords rejected the idea that whites should perform the same "unskilled" tasks as Africans, unlike Albu most of them refused to entertain the notion that Africans should perform so-called skilled work. Browne summed up all these arguments, which had both economic and social rationales, succinctly:

South Africa with its preponderating numbers of blacks is not the country for cheap white labour. The black man is there to stay, and must be dealt with. He must be controlled, and efficiency of control demands utilisation of his work. The assignment of similar work to whites and blacks would result in lowering the standard of each, and breaking down the barriers, which are essential to the supremacy of the white race. A distinct line of separation in the duties of skilled white and unskilled coloured labour is of paramount importance.²⁵⁹

In 1907 clearly neither Browne nor most of the Randlords viewed the colour bar as being dysfunctional to the industry's economic needs. The supervisory system with its rider of specialisation had successfully fragmented the skills of miners, but not of the artisans. It was possible for the mineowners to reduce the number of highly paid white overseers by increasing the numbers of low-paid, supervised African workers. In brief, by increasing the ratio of black mineworkers to skilled white miners, within the confines of the colour bar the industrialists could displace white miners and so reduce working costs.

With the advent of the Chinese labourers in 1904 and the gradual return of the African mineworkers in their pre-war numbers, management, because this was cheaper, reverted to deploying hand drills in preference to rock drills in an increasing number of stopes, especially when they were particularly narrow.²⁶⁰ This caused considerable discontent amongst supervisors who, when they were transferred from rock drills to hand drills, suffered reduced pay. These miners rejected Selborne's rationalisation that hand stoping was healthier than machine work. Rather than stay on the silicosis-ridden mines at reduced pay, a number of British miners returned home.²⁶¹

Reduced wages was not the only reason for the discontent amongst hand drill supervisors. In 1906, when the Corner House launched its productivity drive, it doubled, and sometimes trebled, the number of African hand drillers under the supervision of a single miner.²⁶² Also, white semi-skilled gangers did not assist the supervisors, as was customary. Instead, management deployed African "boss-boys" as intermediaries.²⁶³ The departure from custom threatened the job security of both the semi-skilled overseer, who used the job as a stepping stone to skilled work,²⁶⁴ and the professional miner. Apart from the risk of silicosis, which both groups of workers shared, this manoeuvre by management created for them an identifiable common interest: the threat to their job security by the competition of African

mineworkers. Both groups of white workers urged the government to extend the colour bar to include the semi-skilled ganger, a request which was granted in the mining regulations of 1911.²⁶⁵ Also, both parties petitioned for a legally defined ratio of one white to eight black workers,²⁶⁶ a demand to which the government did not then accede.

When the miners went on strike in 1907, not surprisingly, it was the semi-skilled gangers who joined them and not the artisans. It was only logical that in 1910 the Transvaal Miners' Association should open its ranks to uncertificated miners, at reduced rates, so allowing the semi-skilled gangers to join the union.²⁶⁷ Clearly by 1906 the labour intensive methods of the mineowners, which had very much earlier fragmented the skills of miners, threatened the job security of both professional and aspirant miners.

The successful miners' strike in 1906 on the Crown Deep was a setback to the productivity drive of the Corner House. Even so, a number of the group's mines, through the "co-operation" of a few miners, continued to implement the three-drill system on an informal basis.²⁶⁸ Also, despite the objections of hand drill supervisors to the increased number of Africans they were obliged to oversee in the stopes,²⁶⁹ management extended the practice to include most mines.²⁷⁰

Management also achieved cost savings through its malpractices concerning contract payments. There was substance to the miners' allegations, as the Mining Regulations Commission implicitly conceded,²⁷¹ that management "short-changed" them when it measured stopes or fathomage.²⁷² Also, successful contractors were unable to earn as much as their counterparts had done in the pre-war days. Management openly acknowledged that it "cut" its contract prices in the case of miners whose "monthly cheques became unwieldy".²⁷³ Such cost-cutting practices imposed a heavy strain on the overseas miners, particularly married men, who found it increasingly difficult to cope with the high cost of living on the Witwatersrand.²⁷⁴

Despite the cost savings effected by the industry in 1906, by 1907 its financial position was still precarious. Reduced wages for white miners became an item of priority on the mineowners' agenda. But after the responsible government elections in February 1907 had placed Het Volk, under the leadership of Botha and Smuts, as the party in power, the mineowners were cautious about introducing radical changes. Their spokesmen in the Progressive Party kept a low profile, too. This was a pragmatic policy as Samuel Evans, a local Corner House director, explained to a member of his London board:

If our representatives showed their teeth in opposition then the Government will put the screw on the industry, and they can do it

without appearing to be revengeful. Miners' Phthisis might, for instance, be made an excuse for compelling a company to incur large expense on artificial ventilation and the Labour Party would undoubtedly approve of such a measure.²⁷⁵

Although the mineowners continued to complain vociferously about the miners' inefficiency relative to their high wages, increased productivity still seemed to be the only answer.²⁷⁶ Samuel Evans was convinced that the industry needed to step up further the productivity of white miners without regard to their objections. Heedless of the miners' dread of silicosis, Evans confided to his fellow director, Louis Meyersbach:

You will remember that when I returned from England last year I felt sure that the right thing for us, and in the long run the best thing for the country, would be for our mines to be worked for blood regardless of political considerations. I am more strongly confirmed than ever as to the correctness of that view. There is, I am sure, still considerable room for economy in our mines as far as white labour is concerned.²⁷⁷

Other groups clearly shared the convictions of the Corner House. Disregarding the "white death", the mineowners made the supervision of three drills compulsory. On 1 May 1907 Consolidated Goldfields took the initiative on the Knights Deep. The mine manager formally introduced the three-drill system and at the same time he reduced the contract prices of hand drill supervisors. Such actions precipitated a strike; the striking miners on the Knights Deep delegated the negotiation of the dispute to the Transvaal Miners' Association.²⁷⁸ But when the mineowners refused to negotiate with the miners'

union, the strike spread to all the mines. The extension of the three-drill system from the Corner House properties to a mine belonging to Consolidated Goldfields caused the miners to suspect correctly that the Randlords intended standardising the practice. Of the 9 706 white underground workers on the Witwatersrand, 4 672 went on strike.²⁷⁹

The government held several separate meetings with both the contestants in the dispute, namely the leading mining house directors and the Transvaal Miners' Association. But Het Volk's ministry studiously refrained from intervening. According to Selborne the government adopted an attitude of "perfect impartiality towards employers and employes".²⁸⁰ But the government was also determined to maintain law and order. To help the new government to quell all disturbances, Selborne sanctioned the deployment of the imperial troops, an action which the Colonial Office both approved and supported.²⁸¹ With the help of Afrikaner strike-breakers, the African and Chinese mineworkers, and the artisans, all of whom refused to join the strike, the mines continued to run for the duration of the six-week strike, so ensuring victory to the mineowners.

There can be no doubt that many reasons prompted the miners of the Witwatersrand to join the mine-wide strike, which was a sectional strike confined to miners and semi-skilled gangers. But the catalyst for all the miners' grievances was unquestionably their

vulnerability to silicosis. Disablement and death from an occupational disease helped promote the militancy of the miners. The *Cornubian*, a local Cornish newspaper published in Redruth, conceded that many causes underpinned the Witwatersrand miners' resistance to management. Even so, it stressed the fact that the miners had a primary grievance, which prompted their striking:

Then the most serious question of all was the allegation that miners were expected to curtail their lives by working extra rock-drill machines. Miner's phthisis is a sure man-slayer, and public sympathy is always extended to those in any trade who, by their labours, are soon undermined in health.

The mining mortality returns on the Rand do not show all the havoc wrought by this disease, because hundreds go to their native land when the effects of the disease are felt, and are soon resting under a green plot, while others come to Kimberley and other towns in South Africa for a change, and then the fact of their demise is seen on a verandah pole. In the mining localities in England widows are numerous, and for this miners' phthisis is principally the cause.²⁸²

The Transvaal Miners' Association hoped to negotiate the settlement of the strike. Even so, the union believed the time to be propitious for resisting management. The British administration had dismissed all the former grievances of the miners as being without substance. In 1907 the miners undoubtedly hoped that the new Afrikaner government would be as sympathetic to their complaints as Kruger's government had been and would intervene with the Randlords on their behalf. Also, as the press had failed to

publicise the mortality of miners from the "white death", the Transvaal Miner's Association believed that a strike was the only way it could demonstrate publicly the plight of miners.

But in 1907, as in the past, the actions of both the state and the press bitterly disappointed the miners.²⁸³ The government referred the miners' complaint that three drills promoted silicosis for the investigation of the Mining Regulations Commission,²⁸⁴ but during the dispute the government made no other tangible gestures to assist the miners. The press reports which covered the strike only hinted at the problem of silicosis. In fact, the newspapers, like the Minister of Mines, Jacob de Villiers, "did not think that the injury to the health of running three machines was the primary cause of [the strike]".²⁸⁵ Such indifference to the logic which underpinned the miners' genuine fears provoked the reproving comments of Thomas Mathews, an organiser of the miners' union, to the Mining Regulations Commission:

You see, this is the idea, sir, regarding the running of six machines, that two machines will kill a man after five years, while six will do it in less time. That is a point with which everyone underground is acquainted. Newspaper offices and tin temples; we don't ask them to believe it, because they don't know; but you can take our word in all honesty that the health point of view with us is of the greatest importance.²⁸⁶

After the strike the mineowners could, indeed, "work the mines for blood", as Evans had suggested. Also they effected "considerable" economies "as far as

white labour" was "concerned".²⁸⁷ Lionel Phillips told Julius Wernher triumphantly: "You may rest assured that we are taking every advantage of the strike to reduce working costs as far as possible."²⁸⁸ Management reduced the wages of men on day's pay, irrespective of whether they supervised hand or rock drills, by approximately 25 per cent. Also, contract prices were decreased by a similar amount.²⁸⁹ Finally, from July 1907 to January 1909 the Association of Mine Managers compiled and circulated a "large" inventory of miners who were "black-listed".²⁹⁰ In 1909 the Association resolved to reduce substantially the list of "agitators", but agreed "that there were certain names thereon which should always be kept in".²⁹¹ Indeed, the *Cornubian's* comment, "It does not appear that the miners have gained anything by leaving their work", must have been one of the major understatements of the year.

Nor for the next three years did events in the Transvaal fulfil the misplaced optimism of the Cornish journalist, who saw a silver lining in the cloud that bedevilled the miners who had lost the strike:

If the Rand strike is the means of having steps taken to arrest the progress of this disease it will not have been in vain. The Transvaal government and the mining companies should act together in this most important matter - the saving of human life - and try in every possible way to prolong the lives of miners working on rock-drill machines. Anyone who can do something to check such deaths is a public benefactor. May such be found on the Rand.²⁹²

Such public benefactors did not exist in the ranks of the mining house directors. The mineowners did not wait for the decision of the Mining Regulations Commission as to whether or not the supervision of three drills posed additional health dangers to miners. Immediately after they had won the strike, the mineowners, with the strong support of the Association of Mine Managers, made compulsory the supervision of three drills.²⁹³ The mine managers ruthlessly enforced the mining house mandate, even though, unlike the "press and the tin temples" to which Thomas Mathews had referred, the mine managers were well acquainted with underground working conditions. By the time that the Mining Regulations Commission reported in 1910 that it could not endorse the supervision of three drills under the "prevailing health conditions",²⁹⁴ the three-drill system was thoroughly entrenched.

Also, as we have seen, most mineowners ignored the new regulation, promulgated in response to the directive from the Mining Regulations Commission to the Minister of Mines, that water pipes be installed in the mines.²⁹⁵ Although dust densities may not have deteriorated during the period 1907 to 1910, clearly they did not diminish relative to the previous era. Under such adverse underground conditions, after 1907 there could be no decrease in the prevalence of and mortality from silicosis. Given the chronic nature of the disease, which caused its development over time,

between 1907 and 1910 the mortality from the "white death" undoubtedly grew: its victims now included a steadily increasing number of general miners, as distinct from rock drillers.

By 1910 the Transvaal Miner's Association was in despair about the total indifference of the public, the state and the industry to the "slaughter" in its ranks.²⁹⁶ But it had no substantive communicative channels to reveal the plight of the miners. Therefore when Thomas Mann, a leading British socialist, visited South Africa in 1910, the executive of the miners' union supplied him with details of their work conditions and mortality statistics in the hope that his influence would "diffuse a knowledge" of the disease. Although Mann, with typical eloquence, aired the miners' case, his efforts were in vain. In the legislative assembly, Jacob de Villiers, asserted that Mann's allegations about the deficient ventilation of the mines were a "gross exaggeration".²⁹⁷

The government appointed the Mining Regulations Commission in May 1907. But, as we have noted, illnesses amongst its members, including the death from silicosis of the miners' representative, J. Nicholson, delayed the completion of the final report, which the commissioners submitted only in April 1910.²⁹⁸ As the report indicated clearly, the prevalence of and mortality from silicosis were extremely serious. The findings of the report were so

grave that the government knew that legislation for the compensation of miners, disabled by silicosis, would be the inevitable outcome. Smuts, confirmed in office as Minister of Mines in the pending Union Cabinet under the premiership of Botha, did not want the Transvaal alone to be responsible for the compensation of miners: he wanted the entire Union of South Africa to share the financial burden. The date set for the election of the new Union House of Assembly was 15 September 1910. Consequently Smuts, with the obvious connivance of de Villiers, delayed publication of the report for four months, until the beginning of August 1910, when the election campaign was in full swing.²⁹⁹

The publication of the report did, indeed, create a "sensation".³⁰⁰ It is possible that Smuts hoped that the commission's revelations of the "dismal, if not dangerous", health conditions on the mines would win his South African National Party "a certain number of votes".³⁰¹ But the Unionist Party, which most mineowners supported, parried criticism of the industry by censuring the government for not having produced the report two years' earlier and for its failure to remedy the "evils" of which it complained.³⁰² In an effort to side-step the counter accusations of "neglect", both parties sought "refuge in the statement that the facts were unknown to them".³⁰³ Neither camp could dispute the findings of the commission: both the government and the mineowners

regarded the report, with its moderate recommendations, as being a "judicious" and an "impartial" document.³⁰⁴

The press did not dismiss the death rate amongst Africans from disease, which the commission report showed clearly.³⁰⁵ Even so, the emphasis of most newspaper editorials focused on the "white death", the mortality from silicosis amongst white miners. So, too, it was this aspect of the commission's wide-ranging report that became of exclusive importance in the political arena.

In 1910 the miners unanimously voted at meetings for compensation.³⁰⁶ This had been their demand since 1907, when the Botha government had legalised workmen's compensation: the miners had then urged, as they did in 1910, that silicosis be included as an industrial disease in terms of the act.³⁰⁷ Consequently all the electoral parties vied with each other to provide the best compensation packages for the miners, with the proviso that such schemes affected minimally their own pockets or those of their allies and potential supporters.³⁰⁸

The politicisation of one aspect of the disease, namely the provision of compensation, diverted the government and the mining houses from attending to the sole solution to the problem - the prevention of silicosis. After all, like the establishment of Springkell, the sanatorium for handicapped miners, the

award of compensation was merely a palliative. John X. Merriman understood this more clearly than most of the enthusiastic proponents of compensation. He therefore felt compelled to draw the balming effects of compensation to their attention. In Merriman's view, this was especially important, as the past failure of the government and the mining houses to implement dust precaution measures effectively had caused silicosis to become a social and economic problem of national dimensions. In issuing his sober warning, Merriman noted:

Mere compensation for evil done is a poor substitute for prevention, if prevention is possible. The terrible results of Miners' Phthisis in the past are largely due to negligence in the face of knowledge, the blame for which must be divided.³⁰⁹

But the miners were prepared to settle for compensation, even though it was no recompense "for a life destroyed".³¹⁰ They did, indeed, want effective dust preventive measures. But they believed cynically that the mineowners would "do nothing" to implement precautions against silicosis until they were "compelled" to "pay a million a year".³¹¹

In 1908 Sir Thomas Oliver stated blithely that it was "comparatively easy to obtain statistics relating to Rand miners' phthisis among White men".³¹² But this was not so. The Mining Regulations Commission relied almost solely for its epidemiological data on silicosis from figures supplied by private medical men, namely Louis Godfrey Irvine and Donald Macaulay.

The doctors, as they themselves conceded, could provide the commission with no prevalence figures and their mortality statistics were not reliable.³¹³ A surprising omission by the commissioners, who included Charles Porter, the Johannesburg Medical Officer of Health, was their failure to conduct an independent prevalence survey. It is possible that they believed that the mortality figures, which Irvine and Macaulay provided, were sufficiently serious to warrant their recommending improved dust precaution measures without the need for conducting such a survey themselves.

After making slight adjustments to the statistics of Irvine and Macaulay, the commission reached the following conclusion:

That the death-rate from "Phthisis" (including miners' phthisis) at ages of twenty and over was more than six times greater amongst "white mining males" than amongst white "non-mining males".³¹⁴

Also, the commission implicitly agreed with Macaulay and Irvine that the mortality from "Phthisis", including silicosis, was approximately 11 per thousand per annum amongst white underground workers "at ages of twenty and over".³¹⁵

But E. J. Moynihan, the private consulting engineer who used the same data base as the commission for his calculations, argued strongly that the "Commission had entirely failed to realise or express the real state of things, which is very much worse than they make it out to be". In an interview with

the *Transvaal Leader* Moynihan, with indisputable logic, pointed out "the absurdity of the effect on the public mind of these figures":

They [the commissioners] talk of a death-rate on the mines of 60 or 70 per cent, in excess of non-mining avocations. They say that mining males of 20 years of age and over have a total death-rate of 60 per cent. in excess of non-mining males. Well, now, in the first place it is quite unfair to the non-mining males to take the figures for the ages of 20 "and over", because in the non-mining population there is a comparatively large number of old people, who have a pretty high death-rate, whereas, on the mines, to all intents and purposes, there are no old people at all.³¹⁶

From this premise Moynihan calculated that the death rate of white underground workers from silicosis was not approximately 11 per thousand per annum, as Macaulay and Irvine had concluded, but "in the neighbourhood of 30 per thousand".³¹⁷ As we have noted, the Medical Commission of 1912, reported that no underground worker was "exempt" from contracting silicosis.³¹⁸ But the groups most vulnerable to the disease were ranked according to their order of risk as being rock drillers, trammers, hand drillers and specialist pitmen. Artisans, operatives and salaried men were in the lowest category of danger.³¹⁹ We can therefore conclude tentatively that during the period 1907 to 1910 most of the deaths from silicosis amongst underground workers were amongst the professional miners, who comprised, as we have shown, 60 per cent of the white underground workforce.³²⁰ Accordingly, if we follow Moynihan's calculations, we can conclude that the annual death rate amongst the overseas

miners, including rock drillers, was approximately 30 per thousand.

The highest mortality amongst miners occurred amongst rock drillers who had an average working life of only seven years. In 1907 Irvine and Macaulay estimated the mortality amongst rock drillers to be 31 per thousand per annum.³²¹ But evidence derived from a completely different data base suggests that the death rate amongst rock drillers was far higher than the doctors' cautious estimates. These data derive from death rate statistics for drillers who did not die on the Witwatersrand, but who had returned to their overseas homes.

One important reason that the Mining Regulations Commission in 1908 urged the Minister of Mines to introduce more stringent dust precaution regulations was the information that "at least one third (probably more) of the disabled Rand miners leave the country and die elsewhere".³²² As we have accurate figures from the Redruth district for the deaths of rock drillers who had worked only in the Transvaal, we are able to calculate the total death rate amongst rock drillers who died abroad.

Although we have figures for the Redruth district from 1907 to 1912, the year 1907 is the most suitable time for an assessment of this kind. In 1907 Irvine

and Macaulay had updated their calculations for presentation to the Mining Regulations Commission. Also, the end of 1907 witnessed the exodus of several hundred miners from the Witwatersrand in the aftermath of the miners' strike.

We base our calculations on earlier analysis of the composition of miners according to their country of origin.³²³ Two-thirds of the Cornish miners, who comprised 50 per cent of the overseas contingent on the Witwatersrand, came from the Redruth district. Consequently another two-thirds of the overseas miners came from the rest of Cornwall, from other British districts, from Europe, from America and from Australia. In 1907 the Redruth records showed that fourteen rock drillers, who had worked solely in the Transvaal, died in this district of Cornwall.³²⁴ We can therefore assume that forty-two Rand miners died abroad. These forty-two rock driller constituted the extra one-third of the machine men who died from silicosis overseas. The remaining deaths - 142 - occurred on the Witwatersrand. On the basis of these calculations, which are only tentative, in 1907 approximately 168 rock drillers died from accelerated silicosis.

In each of the years from 1904 to 1907 the industry employed just over 2 000 miners as rock drillers.³²⁵ In 1907 the exact number was 2 237. In that year the death of 168 rock drillers indicates that the mortality amongst machine men was 75 per

thousand per annum. This figure corroborates Moynihan's calculation that the annual death rate amongst white underground workers - it was principally amongst miners - was 30 per thousand.

We must bear in mind that the findings of the Mining Regulations Commission were based on figures provided in 1907. By 1910, when the report was published, these figures were already out of date. As the Medical Commission showed in 1912 the mortality from "Phtthisis", including silicosis, was increasing by 25 per cent each year.³²⁶ Consequently, even though they were appalling, Moynihan's conclusion in mid-1911, when the Medical Commission had just been appointed, were probably correct. Moynihan estimated that the death rate amongst all white underground workers was 80 per thousand per annum and that the annual mortality amongst rock drillers had risen to 140 per thousand.³²⁷ But in 1910 and 1911 only a few perceptive members of the public, including the miners, paid any attention to the probing analyses and calculations of Moynihan. It was only after the Medical Commission had presented its findings in February 1912 that the general public began to take Moynihan's statistics seriously.

By 1913 Moynihan had firmly established his credibility. Indeed, by this time his credentials were so strong that, during the aftermath of the Witwatersrand general strike of 1913, newspapers and public figures all over the world quoted both his

current observations concerning the mortality on the mines from silicosis as well as the conclusion he had drawn as early as 1910. In particular, all such parties tended to repeat in 1913 the striking analogy which Moynihan, following the earlier example of Sir Thomas Oliver, had re-evoked in 1910:³²⁸

It is interesting to make a rough comparison with the death-rates in the British army employed in South Africa during the Boer War and amongst the underground workers of the Rand. Taking the British Army as averaging 300,000 men for two and a half years, I find the "killed in action" to show a lesser death-rate than that suffered by the underground men in the mines, and the death-rate "from all causes" is also unquestionably lower in the case of the British Army in South Africa than amongst the underground men of the Rand. Mining is more dangerous than war; but the miner gets no medals...

In effect this industry about which we brag so much is something to be rather ashamed of, for from the social point of view it is a vampire which battens on the blood of the living and the bodies of the dead.³²⁹

By 1910 the annual death rate from silicosis was rising appreciably. Indeed, from 1912 to 1916 the official figures suggested "that some 800 to 900 'new' cases were arising yearly".³³⁰ For the period 1892 to 1910 the statistics, few as they are, together with the weighty impressionistic evidence of miners and mine officials, suggest strongly that almost an entire generation of overseas professional miners died from an accelerated form of silicosis. Only a handful of general miners, who started work on the Witwatersrand during the 1890s, lived to see the end of World War I. By 1904, most rock drillers who had started work

during the days of Kruger's republic were dead; and the second cohort of rock drillers, who had commenced work after the end of the Anglo-Boer War, died by 1910 or shortly afterwards. The dead undoubtedly included South African miners. But their numbers were insignificant compared to those from overseas. The tragic fate of the Afrikaner miners, handicapped and felled in large numbers by this preventable occupational disease, belongs to a later era. During this period, however, most overseas professional miners whose skills pioneered the South African gold mining industry, died in the prime of life from the swift killer, the "white death".

In a letter to the *Lancet* in 1911, John Law Aymard engraved a brutal epitaph to the British and to the other overseas professional miners:

Such a death-rate from a single occupational disease must be unparalleled in the whole industrial world. It can only be compared with King Leopold's Congo Free State.³³¹

Notes

- 1 *Evening Chronicle*, 4 Aug. 1913, "What the Miner Wants".
- 2 *Worker*, 16 Oct. 1913, "The Miners' Curse".
- 3 *Union Statutes*, 1912, no. 19.
- 4 UG 13, 1913, p. 9, Schedule (2).
- 5 Calculations based on UG 13, 1913, p. 9, Schedule (2).
- 6 Randall, pp. 257-259.
- 7 Randall, p. 258.
- 8 TCMA, file M21(d), memorandum by W. Gemmill, 9 Sept. 1913.
- 9 CAD, MNW, file MM 165/14, H. W. Smythe to Under Secretary for Mines and Industries, enclosure, Secretary of the TCM to Secretary for Mines, 27 Sept. 1913. See also *Centurion*, article 2; and Crawford, p. 10.
- 10 UG 19, 1912, p. 13, par. 32.
- 11 Cd. 7476, 1914, pp. 147-148. See above, chapters 10 and 11.
- 12 CAD, MNW, file MM 2143/1911, T. Mathews to Smuts, 8 Aug. 1911.
- 13 Fitzgerald, Mary autobiography, pp. 1-2.
- 14 *Union House of Assembly Debates*, W. Madeley, 13 May 1913, col. 2369.
- 15 John Cockerill Letters, J. Cockerill to his mother, 5 Oct. 1904.
- 16 *Rand Daily Mail*, 14 April 1911, "A Pauper's Grave".
- 17 BRA, HE, v. 258, file 154M, T. J. Britten to President of the TCM, 15 June 1906.
- 18 CAD, MNW, file MM 2143/1911, T. Mathews to Smuts, 8 Aug. 1911.
- 19 *SAMR*, 25 Nov. 1911, p. 335, "Passing Events".

20 JSAIE, Jan. 1912, "The Prevention of Dust in Development Drives in Mines during Drilling Operations", p. 142, discussant C. B. Saner.

21 Gitsam and Trembath, p. 67, record the facts, but incorrectly. See also Walker and Weinbren, p. 22; and Cope, p. 145.

22 *Worker*, 12 March 1914, "Miners' Scourge". See also *Evening Chronicle*, 9 Aug. 1913, "The 'Agitator' Theory".

23 See, for instance, JCMMS, Jan. 1906, Aug. 1906, Oct. 1906, "Safety Measures in Mining", pp. 227, 40, 43, 112, discussants T. L. Carter, Dr J. Moir, M. H. Coombe and C. B. Saner; TG 2, 1908, pp. 356-357, 428, qq. 3 552-3 555, 4 570-4 571, evidence of R. B. Greer and T. Mathews; and *Final Report of the Mining Regulations Commission*, 1910, v. 2, pp. 13-14, evidence of T. Mathews and M. Trewick.

24 UG 40, 1913, p. 167.

25 JCMMS, Aug. 1906, "Safety Measures in Mining", 43, 112, discussant M. H. Coombe.

26 TG 2, 1908, pp. 428-429, qq. 4 570-4 571, evidence of T. Mathews.

27 TG 2, 1908, p. 315, q. 2 946, evidence of S. S. Crowle.

28 PRO, CO, 291/77, despatches, Lyttelton to Selborne, 31 Dec. 1904, enclosure, par. 3.

29 TG 2, 1908, p. 526, q. 6 220, evidence of E. Moore. See also Macaulay and Irvine, p. 292.

30 *Transvaal Government Gazette*, no. 1278, 24 Dec. 1908.

31 Irvine, p. 223.

32 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 14, evidence of T. Mathews and M. Trewick.

33 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 14, evidence of T. Mathews and M. Trewick.

34 JCMMS, April 1903, "Miner's [sic] Phthisis": Some Notes and Suggestions", p. 246, discussant T. L. Carter.

35 JSAIE, April 1912, "Accidents in Transvaal Mines", p. 410, discussant J. M. Phillips.

36 *Transvaal Leader*, 23 Aug. 1910, letter by "A Miner".

37 TG 2, 1908, p. 517, q. 6 034, evidence of E. Moore.

38 TG 2, 1908, p. 517, q. 6 034, evidence of E. Moore.

39 *South African Mines, Commerce and Industries*, 16 March 1907, p. 28, "The Reduction of Working Costs".

40 *Transvaal Leader*, 23 Aug. 1910, letter by "A Miner". See also JCHMS, Oct. 1906, "Safety Measures in Mining", p. 114, discussant M. H. Coombe.

41 *Mining Journal*, 25 Nov. 1911, p. 1 156, "Miners' Phthisis in the Transvaal". See also UG 40, 1913, p. 112.

42 JSAIE, April 1912, "Accidents in Transvaal Mines", p. 410, discussant J. Moyle Phillips. See also Merriman Papers, correspondence, R. Barry to JXM, 17 Nov. 1913.

43 Pratt, p. 164.

44 Many writers quote Pratt, but do not, unlike Pratt, acknowledge his informant, E. J. Moynihan. See, for instance, Burke and Richardson, p. 165. Burke and Richardson also incorrectly identify Pratt as a miner.

45 See, for instance, BRA, HE, v. 134, S. Evans to R. Schumacher, 20 Nov. 1905, S. Evans to H. Eckstein and Company, 11 Dec. 1905; and CHA, WLF, L. Phillips to Selborne, 18 Jan. 1906.

46 Kubicek, "Financial Capital and South African Goldmining 1886-1914", p. 387; Frankel, *Capital Investment in Africa: Its Cause and Effects*, p. 16.

47 CHA, WLF, L. Phillips to Selborne, 18 Jan. 1906; TG 2, 1908, p. 251, statement of S. J. Jennings.

48 BRA, HE, v. 134, S. Evans to R. Schumacher, 20 Nov. 1905.

49 CHA, WLF, L. Phillips to Selborne, 18 Jan. 1906.

50 JCHMS, Oct. 1906, "Safety Measures in Mining", p. 111, discussant C. B. Saner.

51 TG 2, 1908, p. 694, q. 6 493, evidence of F. Crean; *Final Report of the Mining Regulations Commission*, 1910, v. 2, pp. 14, 236, evidence of T. Mathews and M. Trewick and of Dr L. G. Irvine; Letter Book of City Deep Limited, 1910-1911, J. Whitford to Inspector of Mines, 12 Jan. 1911.

52 JCHMS, Oct. 1906, "Safety Measures in Mining", p. 111, discussant C. B. Saner.

53 JCMMS, Oct. 1906, "Safety Measures in Mining", p. 111, discussant C. B. Saner. See also *Mining Journal*, 15 June 1912, p. 610, "Mortality in the Transvaal Mines". Cf. Greer, p. 259. Grey notes the declining number of skilled miners, but does not attribute this phenomenon to the death and incapacitation of professional miners from silicosis.

54 Crawford, p. 2. See also, BRA, HE, v. 258, file 154M, T. J. Britten to President of the TCM, 18 June 1906.

55 JCMMS, Aug. 1906, "Safety Measures in Mining", p. 40, discussant Dr J. Moir.

56 JCMMS, Jan. 1906, "Safety Measures in Mining", p. 227, discussant T. L. Carter.

57 TG 2, 1908, p. 356, q. 3 533, evidence of R. B. Greer.

58 *Cornubian*, 6 June 1903, "Notes and Comments".

59 See, for instance, TG 2, 1908, p. 512, q. 6 005, evidence of E. Moore.

60 *South African Mines, Commerce and Industries*, 28 July 1906, p. 247, "Leading Article". See also *Cornubian*, 5 Jan. 1907, "Cornwall's Revival", 12 Jan. 1907, "Mining News", 9 Feb. 1907, "Cornish Tin Mining".

61 TG 2, 1908, p. 381, qq. 3 769-3 971, evidence of T. Willis; TG 3, 1910, p. 61; *Mining Journal*, 12 March 1910, p. 293, "Transvaal Mines".

62 TG 2, 1908, p. 478, q. 5 326, evidence of J. Coward. See above, chapter 6.

63 *Transvaal Leader*, 29 Aug. 1910, letter by E. J. Moynihan.

64 See above, chapter 2.

65 *Rand Daily Mail*, 17 July 1911, letter by "Also Guilty".

66 *Worker*, 16 Oct. 1913, "The Miners' Curse".

67 *Rand Daily Mail*, 23 Sept. 1913, letter by G. B. Carlisle.

68 Oliver, "Gold Miners' Phthisis and some of the Dangers to Health incidental to Gold Mining in the Transvaal", p. 1 679. See also Irvine, p. 235; and van Niekerk, p. 269.

69 *Transvaal Leader*, 18 Aug. 1910, letter by Eustace Hill.

70 Oliver, "Gold Miners' Phthisis and some of the Dangers to Health incidental to Gold Mining in the

Transvaal", p. 1 677; van Niekerk, p. 270.

71 Nightingale, p. 193.

72 See, for instance, TG 2, 1908, p. 691, q. 8 878, evidence of F. Crean.

73 *Rand Daily Mail*, 8 Jan. 1908, "Rand Police Courts". I thank Charles van Onselen for this reference.

74 *SAMR*, 1904-1910 passim; *TMJ*, 1905-1910 passim; *Lancet*, 1904-1910 passim; *BMJ*, 1904-1910 passim; *Rand Daily Mail*, 1904-1910 passim; *Star*, 1904-1910 passim.

75 CAD, MNW, file MM 1215/1910, R. N. Kotze to H. W. Smythe, 23 May 1910.

76 *SAMR*, 25 Jan. 1908, p. 30, "Passing Events"; *TMJ*, Aug. 1906, p. 14, "Notes and Comments".

77 *TMJ*, Aug. 1906, p. 14, "Notes and Comments".

78 *Rand Daily Mail*, 8 Jan. 1908, "Rand Police Courts", 12 Jan. 1908, "Lungsava Again".

79 *South African Mines, Commerce and Industries*, 24 Nov. 1906, p. 251, "What shall we do with our Destitute Miners?".

80 *South African Mines, Commerce and Industries*, 24 Nov. 1906, p. 251, "What shall we do with our Destitute Miners?" See also *Rand Daily Mail*, 9 July 1910, "Mine Funds".

81 *Rand Daily Mail*, 25 Feb. 1910, "Miners' Phthisis".

82 CAD, MNW, file MM 2202/10, S. Dieprink to R. N. Kotze, 13 Aug. 1910.

83 *TMJ*, April 1908, p. 220, "The Future of Hospital Control".

84 *SAMR*, 25 March 1906, p. 80, "Johannesburg Notes", 25 May 1906, p. 143, "Johannesburg Letter".

85 Cd. 2104, 1904, p. 90, "Public Health Department Report"; *SAMR*, 15 Sept. 1905, p. 192, "Passing Events".

86 Cd. 2104, 1904, p. 90, "Public Health Department Report". See also *BRA*, HE, v. 258, W. Stuart to C. Hannau, 10 Aug. 1904.

87 *Rand Daily Mail*, 19 April 1912, "Immigrants and Disease".

88 See above, chapter 10.

89 Cd. 2104, 1904, p. 90, "Public Health

Department Report".

90 *Lancet*, 16 Dec. 1911, p. 1 745, "Notes from South Africa"; *SAHR*, 14 Oct. 1911, p. 285, "Passing Events". See also *TMJ*, April 1908, p. 220, "The Future of Hospital Control".

91 *Lancet*, 16 Dec. 1911, p. 1 745, "Notes from South Africa". See also *TMJ*, April 1908, p. 220, "The Future of Hospital Control"; and *SAHR*, 14 Oct. 1911, p. 285, "Passing Events".

92 *Lancet*, 16 Dec. 1911, p. 1 745, "Notes from South Africa".

93 *Rand Daily Mail*, Nov. 1910, "Miners' Phthisis".

94 TCMA, file M3(b), C. Arnott to Secretary of the TCM, 20 Oct. 1904; *SAHR*, Nov. 1904, p. 215, "Passing Events".

95 Council minutes of the AMM, 3 Nov. 1904.

96 TG 2, 1908, p. 449, q. 4 930, evidence of T. Mathews.

97 BRA, HE, v. 258, W. Stuart to C. Hannau, 10 Aug. 1904. According to Thomas Mathews in 1907, immediately after the Anglo-Boer War the mineowners had promised to build the miners a sanatorium. See TG 2, 1908, p. 449, qq. 4 929-4 931, evidence of T. Mathews. Although I have found no evidence to substantiate Mathews' claim, it should be noted that Mathews was not prone to tell lies and to exaggerate. It is possible that Mathews was referring to Arnott's 1904 scheme, which Harold Strange of Consolidated Gold Fields supported strongly. See BRA, HE, v. 258, file 142M, H. Strange to R. Schumacher, 12 Aug. 1904.

98 *TMJ*, Dec. 1905, "The Modderfontein Scandal".

99 *TMJ*, Dec. 1905, "The Modderfontein Scandal"; *South African Mines, Commerce and Industries*, 24 Nov. 1906, p. 251, "What shall we do with our Destitute Miners?".

100 Council minutes of the AMM, 25 Jan. 1906.

101 *South African Mines, Commerce and Industries*, 17 Nov. 1906, p. 229, "A Sanatorium for Miners' Phthisis"; 24 Nov. 1906, p. 251, "What shall we do with our Destitute Miners?" Cf. Grey, p. 332, who incorrectly attributes the idea in 1906 to a journalist writing in the *South African Mines, Commerce and Industries*.

102 TCMA, file M3(b), circular letter, 13 Jan. 1906.

103 *South African Mines, Commerce and Industries*, 17 Nov. 1906, p. 229, "A Sa.atorium for

Miners' Phthisis".

104 TCMA, file M3(b), M. de Jongh to J. G. Hamilton, 22 Oct. 1906, D. Arnott to Secretary of the TCM, 26 Oct., Secretary of the TCM to Dr C. Arnott, 31 Oct. 1906, 6 Dec. 1906.

105 *South African Mines, Commerce and Industries*, 24 Nov. 1906, p. 251, "What shall we do with our Destitute Miners?"

106 Macaulay and Irvine, pp. 298-299; *TMJ*, Feb. 1906, pp. 210-211, "Health Regulations for Mines".

107 *South African Mines, Commerce and Industries*, 24 Nov. 1906, p. 251, "What shall we do with our Destitute Miners?"

108 *JCMMS*, Feb. 1906, pp. 256-258, "Necessity for Attention to Ventilation and Sanitation".

109 Monthly minutes of the AMM, 5 March 1908.

110 Monthly minutes of the AMM, 13 Sept., 13 Nov. 1908.

111 TCMA, file C6(c), circular letter, 24 June 1908.

112 For details see TCMA, file C6(c), legal documents, Secretary of the TCM to Secretary of the Worcester Gold Mining Company, 15 Oct. 1908, Secretary of the TCM to Secretary of the City and Suburban Gold Mining Company, 16 Oct. 1908.

113 TCMA, file C6(c), Secretary of the TCM to Secretary of the City and Suburban Gold Mining Company, 16 Oct. 1908.

114 TCMA, file C6(c), extract of minutes of Randfontein Estates Mining Company, 18 Aug. 1908.

115 TCMA, file M3(c), Secretary of the TCM to Secretary of the Association of Mine Managers, 12 Nov. 1908.

116 TCMA, file M3(c), extract from Minutes of executive committee of the TCM, 15 Oct. 1908.

117 TCMA, file M3(d), J. Smuts to Secretary of the TCM, 22 Sept. 1909. Cf. Grey, p. 324, who incorrectly states that the government bore costs of R1 000 per annum. Lang, p. 225, is also wrong about the maintenance costs borne by the government: the government did not share the costs equally with the Chamber.

118 *TMJ*, April 1908, p. 235, "News and Comments".

119 TCMA, file M3(d), Secretary of the TCM to F. D. P. Chaplin, 24 Aug. 1909.

120 *Transvaal Leader*, 14 Sept. 1909, "Capital and Labour".

121 TCMA, file M3(d), Secretary of the TCM to F. D. P. Chaplin, 24 Aug. 1909.

122 See, for instance, *Rand Daily Mail*, 17 Dec. 1910, "Phthisis Sanatorium"; *Transvaal Leader*, 9 Aug. 1910, letter by E. J. Moynihan.

123 TCMA, file M3(d), J. Strange to J. W. S. Langerman, 15 May 1909.

124 TCMA, file M3(d), circular letter, 25 Jan. 1910; BRA, HE, v. 258, file 154M, Secretary of the TCM to H. Eckstein and Company, 18 April 1911.

125 TCMA, file M3(d), Secretary of the TCM to F. D. P. Chaplin, 24 Aug. 1909.

126 See, for instance, TCMA, file M3(d), Secretary of the TCM to F. D. P. Chaplin, 24 Aug. 1909, and Assistant Colonial Secretary to Secretary of the TCM, 19 March 1910.

127 *Rand Daily Mail*, 23 September 1913, letter by G. B. Carlisle.

128 *Rand Daily Mail*, 20 Nov. 1911, "Miners' Phthisis".

129 TCMA, file C.5.1(a), 1920, "Report by Dr. A. Fringle".

130 *Rand Daily Mail*, 30 Aug. 1911, "Phthisis Troubles".

131 TG 2, 1908, p. 449, q. 4 929A, evidence of T. Mathews.

132 *Rand Daily Mail*, 30 Aug. 1911, "Phthisis Troubles".

133 SC 4, 1914, pp. 56, q. 322, evidence of B. G. V. de Witt Hamer.

134 SC 4, 1914, pp. 57, q. 326, evidence of B. G. V. de Witt Hamer. It is beyond the scope of the study to explore in depth the failure of Springkell.

135 *Cornubian*, 10 July 1913, "The Trouble on the Rand".

136 *Voice of Labour*, 24 June 1910, "The Benoni Meeting".

137 *Transvaal Leader*, 14 Sept. 1909, "Capital and Labour".

138 *Rand Daily Mail*, 17 July 1911, letter by "Also Guilty".

139 *Worker*, 21 Aug. 1913, "The Industry and Human Life".

140 SC, 10, 1912, p. 215, q. 1 527, evidence of W. J. Wybergh.

141 SC, 10, 1912, p. 215, q. 1 527, evidence of W. J. Wybergh.

142 *Transvaal Leader*, 27 Aug. 1910, letter by E. J. Moynihan. See also *ibid.*, 30 April 1910, "Labour Notes", 6 Aug. 1910, "Gen. Smuts's Indiscretion"; and *Union Senate Debates*, P. Whiteside, 17 June 1912, col. 758.

143 *Transvaal Statutes*, 1907, no. 36. See, for instance, *Transvaal Legislative Assembly Debates*, P. Whiteside, 22 July 1907, col. 1238.

144 TB 3, 1908, p. 1 416, q. 20 342, evidence of J. J. Ware.

145 See, for instance, *Rand Daily Mail*, 1 May 1911, "Labour Day".

146 Cope, pp. 78-79; Gitsham and Trembath, pp. 28, 65-66; Ticktin, p. 35; Kennedy, *A Tale of Two Mining Cities*, p. 52; Thorpe, p. 20.

147 Katz, *A Trade Union Aristocracy*, pp. 175-185.

148 Gitsham and Trembath, pp. 28, 65-66; Ticktin, pp. 35, 256-257; Kennedy, *A Tale of Two Mining Cities*, p. 52.

149 Both Ticktin, p. 35, and Kennedy, *A Tale of Two Mining Cities*, p. 52, note the fortitude of the union, but assume that the union was "weak".

150 *Labour Leader*, 1 May 1913, "Socialism in South Africa".

151 *Transvaal Leader*, 28 Aug. 1909, "Capital and Labour". For details on the early years of the Transvaal Miners' Association, see Katz, *A Trade Union Aristocracy*, pp. 55-59, 113-115.

152 *Rand Daily Mail*, 17 July 1911, letter by "Also Guilty". See also *Transvaal Leader*, 28 Aug. 1909, "Capital and Labour".

153 *Rand Daily Mail*, 31 Dec. 1920, "Nine Workers' Union".

154 Gitsham and Trembath, p. 28. See also Thorpe, p. 20; Yudelman, p. 74; and Grey, p. 293. In following Gitsham and Trembath, these historians also state incorrectly that the miners' union had only 300 members.

155 TG 2, 1908, p. 427, q. 4 542, evidence of T. Mathews. Cf. Ticktin, pp. 256-257, who incorrectly claims that the union's membership grew both during and after the strike.

156 *Rand Daily Mail*, 31 Dec. 1920, "Mine Workers' Union".

157 *Rand Daily Mail*, 9 June 1910, "Mine Funds". See also Katz, *A Trade Union Aristocracy*, p. 58; and Mann, p. 197.

158 TG 3, 1910, p. 61.

159 TG 2, 1908, p. 427, qq. 4 542-4 544, evidence of T. Mathews.

160 TG 3, 1910, p. 61; TG 2, 1908, p. 381, qq. 3 969-3 971, evidence of T. Willis; *Mining Journal*, 12 March 1910, p. 293, "Transvaal Mines"; *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 3, evidence of T. Mathews and M. Trewick.

161 The nickname seems to have been coined by the *Transvaal Leader*, when it commented on the findings of the Mining Regulations Commission which were published in August 1910. See *Transvaal Leader*, 11 Aug. 1910, editorial. From then on the nickname became a standard expression.

162 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 263, evidence of Dr L. G. Irvine.

163 *House of Commons Debates*, W. S. Caine, 29 Oct. 1902, col. 1970.

164 *Report of the Miners' Phthisis Commission*, 1902-1903, Appendix F.

165 Van Niekerk, p. 27.

166 PRO, CO, despatches, Milner to Lyttelton, 21 March 1904; TCMA, file N8, A. Lawley to President of the TCM, 17 May 1904; Cd. 2183, 1904, pp. 144-145, Annexure J. See above, chapter 10.

167 *Report of the Coloured Labour Compound Commission*, 1905, p. 79, Appendix G2. See also Irvine and Macaulay, p. 356.

168 Merriman Papers, correspondence, 1913, no. 47, memorandum from the Secretary for Native Affairs.

169 *Report of the Coloured Labour Compound Commission*, 1905, p. 79, Appendix G2.

170 Merriman Papers, correspondence, 1913, no. 47, memorandum from the Secretary for Native Affairs.

171 *Report of the Coloured Labour Compound*

Commission, 1905, p. 79, Appendix 62; Merriman Papers, correspondence, 1913, no. 47, memorandum from the Secretary for Native Affairs.

172 Cd. 1897, 1904, p. 163, q. 3 630, evidence of L. Cohen.

173 Cd. 1897, 1904, p. 163, q. 3 630, evidence of L. Cohen.

174 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 20, qq. 63-66, evidence of Dr L. G. Irvine.

175 TG 2, 1908, p. 459, q. 5 088, evidence of T. Mathews.

176 Star, 12 Nov. 1902, "Miners' Phthisis; Irvine and Macaulay, p. 365; Fern, p. 874.

177 Cd. 2091, 1904, p. 25; Oliver, "An Address on Rand Miners' Phthisis...", p. 919.

178 Oliver, "An Address on Rand Miners' Phthisis...", p. 919; TCMA, file Ch23, G. Farquarson to Secretary TCM, 26 Nov. 1905, enclosed memorandum by Dr C. L. Sansom, 21 Nov. 1905.

179 TCMA, file Ch23, G. Farquarson to Secretary TCM, 26 Nov. 1905, enclosed memorandum by Dr C. L. Sansom, 21 Nov. 1905.

180 *Report of the Miners' Phthisis Commission, 1902-1903*, pp. 21, 25, qq. 67, 110-113, evidence of Dr L. G. Irvine and Dr D. Macaulay.

181 For details on the length of contracts and their renewal by workers, see Jeeves, *Migrant Labour in South Africa's Mining Economy*, p. 55; SC 2, 1913, p. 114, qq. 1 162-1 169, evidence of Dr G. A. Turner; and Irvine and Macaulay, pp. 348-349.

182 *Report of the Miners' Phthisis Commission, 1902-1903*, p. 21, qq. 69-70, evidence of Dr L. G. Irvine.

183 Fern, p. 874; SC 9, 1913, p. 117, qq. 1 213-1 214, evidence of Dr G. A. Turner; van Niekerk, pp. 30-31, 284-286.

184 TNJ, 1 Sept. 1905, pp. 25-26, editorial.

185 Turner, *Report on the Prevalence of Pulmonary Tuberculosis and Allied Diseases in the Kraals of the Natives of Portuguese African Territory, South of Latitude 22°...*, p. 7.

186 Turner, *Report on the Prevalence of Pulmonary Tuberculosis and Allied Diseases in the Kraals of the Natives of Portuguese African Territory, South of Latitude 22°...*, p. 14.

187 Turner, *Report on the Prevalence of Pulmonary Tuberculosis and Allied Diseases in the Kraals of the Natives of Portuguese African Territory, South of Latitude 22°...*, pp. 8-13.

188 Turner, *Report on the Prevalence of Pulmonary Tuberculosis and Allied Diseases in the Kraals of the Natives of Portuguese African Territory, South of Latitude 22°...*, p. 14.

189 See above, chapter three. Girdwood, pp. 5-6.

190 SC 10, 1912, p. ix, Appendix C; *Transvaal Debates of both Houses of Parliament*, J. de Villiers, 29 April 1910, col. 523.

191 See, for instance, *Transvaal Debates of both Houses of Parliament*, J. de Villiers, 6 April 1910, cols. 635-636; CHA, WLF, memorandum by Madew, 30 Jan. 1913; SC 2, 1913, p. 117, qq. 1 203-1 216, evidence of Dr G. A. Turner; and *Evening Chronicle*, 10 June 1913, "Long and Short Contracts".

192 Surprisingly, Packard's study overlooks entirely Turner's report. Also, in his study of tuberculosis, Packard fails to mention the frequent association of this disease with silicosis, particularly in the case of Africans.

193 Packard, p. 202.

194 *The Prevention of Silicosis on the Mines of the Witwatersrand*, p. 242.

195 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 263, evidence of Dr L. G. Irvine.

196 SC 2, 1913, p. 119, q. 1 221, evidence of Dr G. A. Turner.

197 SAMR, 10 March 1906, p. 65, "Johannesburg Notes".

198 *Lancet*, 6 May 1909, p. 2 363, "House of Commons".

199 Grey, p. 226.

200 Oliver, *The Diseases of Occupation*, p. 285.

201 Oliver, *The Diseases of Occupation*, p. 292.

202 CAD MNW, file MM 1106/10, R. N. Kotze to H. W. Smythe, 30 April 1910.

203 *Final Report of the Mining Regulations Commission*, 1910, v. 1, p. 282.

204 TMJ, Jan. 1908, pp. 175, "News and Comments", March 1908, pp. 208-209, "News and

Comments".

205 Van Niekerk, pp. 3-5.

206 It is beyond the scope of this study to provide the reasons for the paucity of Africans, who applied for compensation initially. But see, for instance, SC 4, 1914, 324-326, qq. 1 792-1 805, evidence of S. A. M. Pritchard.

207 Van Niekerk, p. 28.

208 Van Niekerk, pp. 111-131.

209 Van Niekerk, pp. 101-109.

210 Van Niekerk, pp. 93-99.

211 SC 2, 1913, p. 145, qq. 1 108-1 112, evidence of S. V. van Niekerk.

212 See, for instance, Hurwitz, p. 127.

213 Van Niekerk, p. 30.

214 Van Niekerk, p. 40.

215 Van Niekerk, pp. 33-34.

216 Watkins-Pitchford, "The Industrial Diseases of South Africa", p. 37.

217 Oliver, "An Address on Rand Miners' Phthisis...", p. 919.

218 Native Grievances Commission, transcript of evidence, 2 Feb. 1914, p. 23, evidence of S. A. M. Pritchard.

219 *Union House of Assembly Debates*, A. Mentz, 13 May 1913, cols. 2 372-2 373, J. X. Merriman, 13 May 1913, col. 2378, F. S. Malan, 27 May 1913, cols 2786-2787; SC 2, 1913, p. 128, q. 1 269, evidence of Dr A. J. Gregory; SC 14, 1914, p. 361, qq. 2 000-2 001, evidence of S. A. M. Pritchard.

220 Van Niekerk, p. 34.

221 Irvine and Watt, p. 36.

222 JCMMS, Dec. 1906, "Safety Measures in Mining", p. 174, reply to discussion.

223 Unless otherwise stated, the following data derive from SC 9, 1913, p. 200, statement of C. H. Spencer, presented by J. G. Lawn.

224 Van Niekerk, pp. 28, 39. This calculation excludes the Africans who came from Portuguese East Africa north of Latitude 22° South and whose further recruitment was forbidden in May 1913. See *Union House of Assembly Debates*, J. W. Sauer, 8 May 1913,

cols. 2229-2230.

225 SC 2, 1913, p. 76, q. 638, evidence of C. G. Davidson; SC 9, 1913, p. 200, q. 1 424, statement of C. H. Spencer presented by J. G. Lawn.

226 SC 9, 1913, p. 200, q. 1 424, statement of C. H. Spencer presented by J. G. Lawn.

227 Oliver, *Diseases of Occupation*, p. 235.

228 Cd. 1897, 1904, pp. 64-85, 163, qq. 1 749, 3 630, evidence of G. Lagden and L. Cohen.

229 *Cornubian*, 22 May 1903, "Notes and Comments".

230 See BRA, HE, v. 244, file 107H, S. Jennings to H. Eckstein and Company, 9 Oct, 1906, where mention is made of the Africans' objections to using atomisers and sprays.

231 Fraser and Jeeves, p. 253, L. Phillips to F. Eckstein, 28 Aug. 1911. It should be noted, too, that wages for hand drill work, which had risen, were on a par with rock drill work.

232 See, for instance, *Rand Daily Mail* 15 Feb. 1912, "Miners' Phthisis". The writer of the article contended that "the fear of phthisis [silicosis] at present keeps many natives from coming to the mines".

233 Kubicek, "Financial Capital and South African Goldmining 1886-1914", p. 387; Frankel, *Capital Investment in Africa: Its Cause and Effects*, p. 15.

234 See above, chapter 11

235 TG 2, 1908, pp. 166-167, 233, qq. 1 508, 3 292, evidence of E. J. Way and G. Albu. See above, chapter 5.

236 TG 2, 1908, pp. 166-167, qq. 1 504-1 508, evidence of E. J. Way.

237 See, for instance, BRA, HE, v. 134, S. Evans to R. Schumacher, 20 Nov. 1905, S. Evans to H. Eckstein and Company, 11 Dec. 1905.

238 See, for instance, CHA, WLF, L. Phillips to Selborne, 18 Jan. 1906; BRA, HE, v. 135, L. Phillips to F. Eckstein, 10 Jan. 1910; Fraser and Jeeves, pp. 163, 164, 179, L. Phillips to J. Wernner, 18 June 1906, 3 June 1907.

239 Fraser and Jeeves, pp. 163, 164, 179, L. Phillips to J. Wernner, 18 June 1906, 3 June 1907; BRA, HE, v. 134, S. Evans to J. Wernner, 24 Sept. 1906.

240 BRA, HE, v. 145,

F. Eckstein to L. Phillips, 20 April 1906. See also
CHA, WLF, L. Phillips to Selborne, 18 Jan. 1906.

241 Thorpe, pp. 288-289. Thorpe's mistake
derives from her inadequate consultation of both
primary and published sources, including the
correspondence in the archives of H. Eckstein and
Company, the minutes of evidence to the Mining
Industry Commission and to the Mining Regulation
Commission, the Ross E. Browne report, the *Journal of
the Chemical, Metallurgical and Mining Society of
South Africa* and the *South African Mines, Commerce and
Industries*.

242 BRA, HE, v. 134, S. Evans to R. Schumacher,
20 Nov. 1905, S. Evans to H. Eckstein and Company, 11
Dec. 1905, v. 145, F. Eckstein to L. Phillips, 20
April 1906; CHA, WLF, L. Phillips to Selborne, 18 Jan.
1906; Browne, p. 298.

243 Browne, p. 289.

244 Browne, pp. 332, 341. See also Fraser and
Jeeves, p. 164, L. Phillips to Messrs Wernher, Beit
and Company, 18 June 1906.

245 BRA, HE, v. 145, F. Eckstein to L.
Phillips, 20 April 1906. The Corner House agreed that
Ross E. Browne's report be published as an appendix in
the *Report of the Mining Industry Commission* in 1908.
L. J. Rayersbach handed it in as evidence to the
commission in 1907. See TS 2, 1908, pp. 1 591-1 628,
Appendix I. Browne presented his paper for discussion
in June 1907 to the South African Institution of
Engineers. See JSAIE, June 1907, pp. 289-345.

246 See, for instance, CHA, WLF, Secretary of
the City and Suburban to Secretary, Maritzburg, 22
June 1906.

247 See, for, instance, *South African Mines,
Commerce and Industries*, 10 March 1906, pp.
1 209-1 210, 17 March 1906, pp. 3-4, and 13 Oct.
1906, pp. 107-108, "Leading Articles".

248 *South African Mines, Commerce and
Industries*, 17 March 1906, pp. 3-4, "Leading
Article".

249 See, for instance, *South African Mines,
Commerce and Industries*, 23 Oct. 1906, pp. 107-108,
"Leading Article".

250 Browne, p. 290.

251 *South African Mines, Commerce and
Industries*, 23 Oct. 1906, p. 108, "Leading Article".

252 *Star*, 11 Oct. 1906, "Miners at the Crown
Deep"; *South African Mines, Commerce and Industries*,
23 Oct. 1906, pp. 107-108, "Leading Article".

253 *South African Mines, Commerce and Industries*, 23 Oct. 1906, p. 108, "Leading Article".

254 See, for instance, *Cornubian*, 29 Aug. 1907, "The Position in South Africa"; and *West Briton*, 18 July 1907, "Employers and Miners in the Transvaal".

255 CHA, WLF, Secretary of the City and Suburban to Secretary, Maritzburg, 22 June 1906.

256 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 10, evidence of T. Mathews and M. Treweek; CHA, WLF, Secretary of the City and Suburban to Secretary, Maritzburg, 22 June 1906.

257 Richardson, *Chinese Mine Labour in the Transvaal*, pp. 184-185.

258 TG 2, 1908, p. 246, q. 2 462, evidence of G. Fabu.

259 Browne, p. 297.

260 Fraser and Jeeves, p. 124, L. Phillips to J. Wernher, 26 Feb. 1900; BRA, HE, v. 134, S. Evans to H. Eckstein and Company, 27 Aug. 1906.

261 PRO, CO, 291/83, despatches, Selborne to Lyttelton, 7 June 1905, 291/90, parliament, 14 March 1905.

262 BRA, HE, v. 134, S. Evans to R. Schumacher, 20 Nov. 1905, S. Evans to H. Eckstein and Company, 11 Dec. 1905; TG 2, 1908, pp. 250, 342, 373, 386, qq. 3 330, 3 819, 4 081, statement of S. J. Jennings and evidence of C. C. Smith, T. Willis and T. Mathews.

263 TG 2, 1908, p. 377, q. 3 819, evidence of T. Willis.

264 Van Niekerk, p. 11.

265 *Mines and Works Regulations*, 1911, p. 1; "Definition of Terms".

266 TG 2, 1908, p. 379, q. 3 954, evidence of T. Willis.

267 *Rand Daily Mail*, 21 Nov. 1910, "Rand Workers' Federation". See above, chapter 10.

268 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 10, evidence of

253 *South African Mines, Commerce and Industries*, 23 Oct. 1906, p. 108, "Leading Article".

254 See, for instance, *Cornubian*, 29 Aug. 1907, "The Position in South Africa"; and *West Briton*, 18 July 1907, "Employers and Miners in the Transvaal".

255 CHA, WLF, Secretary of the City and Suburban to Secretary, Maritzburg, 22 June 1906.

256 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 10, evidence of T. Mathews and M. Trewick; CHA, WLF, Secretary of the City and Suburban to Secretary, Maritzburg, 22 June 1906.

257 Richardson, *Chinese Mine Labour in the Transvaal*, pp. 184-185.

258 TG 2, 1906, p. 246, q. 2 462, evidence of G. Albu.

259 Browne, p. 297.

260 Fraser and Jeeves, p. 124, L. Phillips to J. Wernher, 26 Feb. 1905; BRA, HE, v. 134, S. Evans to H. Eckstein and Company, 27 Aug. 1906.

261 PRO, CO, 291/93, despatches, Selborne to Lyttelton, 7 June 1905, 291/90, parliament, 14 March 1905.

262 BRA, HE, v. 134, S. Evans to R. Schumacher, 20 Nov. 1905, S. Evans to H. Eckstein and Company, 11 Dec. 1905; TG 2, 1908, pp. 250, 342, 373, 386, qq. 3 330, 3 819, 4 081, statement of S. J. Jennings and evidence of C. C. Smith, T. Willis and T. Mathews.

263 TG 2, 1908, p. 373, q. 3 819, evidence of T. Willis.

264 Van Niekerk, p. 11.

265 *Mines and Works Regulations*, 1911, p. 1; "Definition of Terms".

266 TG 2, 1908, p. 377, q. 3 954, evidence of T. Willis.

267 *Rand Daily Mail*, 21 Nov. 1910, "Rand Workers' Federation". See above, chapter 10.

268 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 10, evidence of

T. Mathews and M. Trewick; TG 2, 1908, p. 432, q. 4 634, evidence of T. Mathews.

269 *South African Mines, Commerce and Industries*, 17 March 1906, pp. 3-4, "Leading Article".

270 *Final Report of the Mining Regulations Commission*, 1910, v. 2, pp. 26-27, evidence of T. Mathews and M. Trewick.

271 *Final Report of the Mining Regulations Commission*, 1910, v. 1, pp. 284-290.

272 TG 2, 1908, pp. 436, 521, 823, qq. 4 718, 6 111, 11 B49, evidence of T. Mathews, E. Moore and R. Raine; Austin, p. 141.

273 *South African Mines, Commerce and Industries*, 13 Oct. 1906, p. 107, "Leading Article". See also TG 2, 1908, pp. 389, 398, qq. 4 118-4 121, 4 227-4 279, evidence of T. Mathews and G. E. Webber.

274 See, for instance, BRA, HE, v. 134, S. Evans to R. Schumacher, 20 Nov. 1905; and *Cornubian*, 29 Aug. 1907, "The Position in South Africa".

275 BRA, HE, v. 134, S. Evans to F. Eckstein, 2 March 1907.

276 BRA, HE, v. 134, S. Evans to F. Eckstein, 20 Feb. 1907.

277 BRA, HE, v. 138, S. Evans to L. J. Meyersbach, 2 March 1907.

278 Unless otherwise noted, the summary of the strike is based on the following: Katz, *A Trade Union Aristocracy*, pp. 74, 132-133, 179, 256, 424, 453; Grey, pp. 264-292; and Thorpe, pp. 316-529.

279 *West Briton*, 18 July 1907, "Employers and Miners in the Transvaal".

280 PRO, CO, 291/71, despatches, Selborne to Elgin, 23 May 1907, telegram.

281 PRO, CO, 291/71, despatches, Selborne to Elgin, 23 May 1907, telegram, minute by Sir. F. Hopwood, 24 May 1907.

282 *Cornubian*, 29 Aug. 1907, "The Position in South Africa".

283 Cf. Ticktin, p. 252, who claims that the "strike had widespread sympathy and support". Its support derived only from members of the white working class, the families of miners and artisans, and the few partisans of organised labour.

284 *Final Report of the Mining Regulations Commission*, 1910, v. 1, p. 237; Merriman Papers,

correspondence, J. de Villiers to JXM, 30 May 1907.

285 Merriman Papers, correspondence, J. de Villiers to JXM, 30 May 1907. See also, for instance, *Transvaal Leader*, 27 May 1907, "Miners' Strike".

286 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 12, evidence of T. Mathews and M. Trewick.

287 BRA, HE, v. 138. S. Evans to L. J. Meyersbach, 2 March 1907.

288 Fraser and Jeeves, p. 179, L. Phillips to J. Wernher, 3 June 1907.

289 Council Minutes of the AMM, 23 July 1907; *GMEAR*...30 June 1910, p. 38; TG 2, 1908, pp. 690, 912, qq. B 844, 13 547, evidence of F. Crean and H. F. Petersen; TG 2, 1909, pp. 49, 51; *Mining Journal*, 12 March 1910, p. 293, "Transvaal Mines."

290 Council minutes of the AMM, 7 July 1907; Monthly minutes of the AMM, 7 Nov. 1907, 5 Dec. 1907, 19 Jan. 1909.

291 Monthly minutes of the AMM, 19 Jan. 1909.

292 *Corrubián*, 29 Aug. 1907, "The position in South Africa".

293 TG 2, 1908, pp. 644, 834, qq. B 033-B 036, 12 118-12 119, evidence of R. Raine.

294 *Final Report of the Mining Regulations Commission*, 1910, v. 1, p. 237.

295 See above, chapter 11.

296 *Centurion*, article 1.

297 Mann, p. 197.

298 *Transvaal: Debates of both Houses of Assembly*, J. de Villiers, 29 April 1910, col. 523.

299 I have no evidence for this theory. But it seems to be logical.

300 *Transvaal Leader*, 11 Aug. 1910, editorial.

301 *Mining Journal*, 24 Sept. 1910, p. 1 134, "The Transvaal Mines Regulations' Commission".

302 See, for instance, *Transvaal Leader*, 11 Aug. 1910, editorial.

303 *Mining Journal*, 24 Sept. 1910, p. 1 134, "The Transvaal Mines Regulations' Commission".

304 See, for instance, *Rand Daily Mail*, 6 Aug. 1910; and *Transvaal Leader*, 11 Aug. 1910, editorial.

305 See, for instance, *Transvaal Leader*, 11 Aug. 1910, "The White Death", 19 Aug. 1910, "Chamber of Mines".

306 *Transvaal Leader*, Aug. to Oct. 1910 passim; *Rand Daily Mail*, Aug. to Oct. 1910 passim; *Star*, Aug. to Oct. 1910 passim.

307 *Transvaal Leader*, 10 April 1909. "Labour Day".

308 It is beyond the scope of this study to detail the compensation schemes. But see *Transvaal Leader*, Aug. to Oct. 1910 passim; *Rand Daily Mail*, Aug. to Oct. 1910 passim; *Star*, Aug. to Oct. 1910 passim.

309 SC 10, 1912, p. ix, Appendix C.

310 *Rand Daily Mail*, 7 May 1913, letter from an anonymous miner.

311 *Rand Daily Mail*, 11 April 1913, "Phthisis Terror"; *Evening Chronicle*, 16 May 1914, letter by "Humanitarian".

312 Oliver, *Diseases of Occupation*, p. 285.

313 *Final Report of the Mining Regulations Commission*, 1910, v. 2, pp. 140-141, evidence of Dr L. G. Irvine.

314 *Final Report of the Mining Regulations Commission*, 1910, v. 1, p. 37, par. (2).

315 *Final Report of the Mining Regulations Commission*, 1910, v. 1, p. 37, par. (3).

316 *Transvaal Leader*, 29 Aug. 1910, "Miners' Phthisis".

317 *Transvaal Leader*, 29 Aug. 1910, "Miners' Phthisis".

318 UB 19, 1912, p. 18, par. 44.

319 UB 19, 1912, pp. 14, 15, 18, pars. 27, 31, 42, 43.

320 See above, chapter 6.

321 *Final Report of the Mining Regulations Commission*, 1910, v. 2, p. 241, evidence of Dr L. G. Irvine.

322 *Final Report of the Mining Regulations Commission*, 1910, v. 1, p. 34. See also *ibid.*, v. 2, p. 241, evidence of Dr. L. G. Irvine.

323 See above, chapter 6.

324 Cd. 7476, 1914, p. 148, Table A.

325 TG 2, 1908, pp. 83-84, evidence of H. Weldon, Annexure E; *GNEAR*...30 June 1907, table showing "White Wages" - Mines and Works, Transvaal".

326 UG 19, 192, p. 21, par. 21.

327 *Lancet*, 2 Dec. 1911, p. 1 587, letter by Dr J. L. Aymard quoting the published figures of E. J. Moynihan.

328 See, for instance, *Evening Chronicle*, 24 July 1913, "Opinions about the Strike"; *Worker*, 21 Aug. 1913, "The Industry and Human Life"; *Labour Leader*, 7 Aug. 1913, "Parliament Day by Day"; and *Reynolds Newspaper*, 8 Aug. 1913, "City of Dreadful Death".

329 *Transvaal Leader*, 29 Aug. 1910, "Miners' Phthisis".

330 Fraser and Irvine, p. 6.

331 *Lancet*, 2 Dec. 1911, p. 1 587, letter by Dr J. L. Aymard.

CHAPTER 13

CONCLUSION

"There are two points about our great gold mining industry that the world most cheerfully condones. The Death Rate and The Dividends."---*Evening Chronicle*, 1913.¹

"It is obvious that the gold mines of the Transvaal are little better than charnel houses...Men are being choked by the dust from the rock drills and then flung away as pitilessly as if they were mere bundles of old clothes."---*Reynolds Newspaper*, 1913.²

In a recent statement extolling the enormous achievements of the South African gold mining industry, R. N. (Tom) Main, Chief Executive of the Chamber of Mines of South Africa, nevertheless admits to there having been some pioneering "warts".³ This study has examined one of those "warts" inexplicably neglected by historians for virtually the entire century. These are the conclusions.

First, almost an entire generation of overseas miners, whose skills pioneered the South African gold mining industry, died from silicosis. Most of the miners remained migrants because their relatively high

money wages did not compensate for the high cost of living on the Witwatersrand. Although most of the miners came from Britain, they were not, contrary to the conventional wisdom, almost exclusively Cornish. The Cornish comprised approximately 50 per cent of the overseas contingent, while approximately 35 per cent of them came from other British counties. The dead included pioneer rock drillers as well as the second cohort of rock drillers who joined the workforce on the gold mines after the Anglo-Boer War in 1902. The victims were also most of the early-day general miners. They, too, contracted a more rapidly developing form of silicosis than their counterparts at metal mines elsewhere, including Cornwall.

When disabled by the occupational disease, most miners, if they could afford to do so, returned to their overseas homes. Health care facilities for patients with chronic illnesses were virtually absent on the Witwatersrand. Consequently, as with sick African migrant workers whose rural homesteads provided health benefits, communities in Great Britain were obliged to accept responsibility for their incapacitated and dying migrant miners as well as for the miners' dependants. The figures provided in historical summaries, written by health officers and government commissions, have seriously under-estimated the number of overseas miners who died from silicosis during this period. The findings of this study rectify this failing.

Second, there are the responses to the disease by the Randlords and the successive governments of the Transvaal, namely the British administration under Crown Colony rule, from 1902 to 1907, and the ministry of Het Volk, the party in power during Responsible Government, from 1907 to 1910.

In 1901 the Transvaal authorities discovered that there was a high mortality from accelerated silicosis amongst the Witwatersrand miners, particularly rock drillers. By that time the cause of the disease had been identified and the precautions for its prevention, despite their lack of sophistication, were available. Even so, the British administration and the Randlords did virtually nothing to prevent the occurrence of silicosis.

For instance, there is the widely accepted view that in 1902 the Governor of the Transvaal and High Commissioner of South Africa, now raised to the peerage as Viscount Milner, acted decisively in appointing the Weldon Commission - the first commission of its kind - to investigate silicosis. Such a view is completely without foundation. There were other problems concerning the gold mines which Milner considered to be more important. These included the African labour shortage and the high mortality amongst Africans, which threatened to thwart the scheme of Milner and the Randlords to import indentured Chinese labourers. Regarding silicosis,

Milner acted tardily and hesitantly, if not reluctantly. He did, indeed, finally appoint the commission, but only as a result of pressure from the British House of Commons.

At this time, too, there was a similar enquiry in Cornwall, the Haldane Commission, which also made valuable recommendations. But unlike the case in Cornwall, on the Witwatersrand there was no co-operative commitment between the government and the employers to implement the recommendations of the Weldon Commission and so to prevent the disease. The mining industrialists waited for the government to enact dust precaution measures and then expected the state to do its own policing regarding their enforcement. This is precisely what the Transvaal government did not do. Instead, it took an inordinately long time to introduce remedial measures only to withdraw them the following year.

A similar pattern emerged during the time of Transvaal Responsible Government. The new Government Mining Engineer, R. N. Kotze, showed more resolution than his predecessor, H. Weldon, in trying to eliminate the disease. But Kotze lacked the whole-hearted support of the Botha-Smuts government; and the Minister of Mines, J. de Villiers, virtually ignored the problem. Consequently the mineowners continued to pay mere lip-service to the regulations. They were not prepared to pay trifling sums of money for the simple schemes to facilitate the allaying of

dust with water. Further, ignoring their own advisers, they were even less willing to introduce more expensive measures to improve ventilation.

During the 1890s the Randlords used mass production techniques, which involved both mechanisation and labour intensive practices, peculiar to the Witwatersrand, to "speed up" the excavation of the ore. The scale of these operations, which can be likened to major military exercises, has been generally underestimated. Such mining practices, implemented in both outcrop and deep level mines, created inordinately high dust densities. Both in absolute and in relative terms the prevalence of and mortality from accelerated silicosis on the Witwatersrand gold mines was considerably higher than at other metalliferous mining centres, where mining operations were conducted in a more leisurely way. After 1902 the mineowners intensified production. On the mines everything became subordinated to achieving high production levels and to reducing working costs.

In spite of the ravages of the "white death", successive governments supported the mineowners' production objectives. The result was that there were only perfunctory safeguards against dust. When these puny measures failed to control the prevalence of the disease, both the controlling parties - the state and the mineowners - transferred the blame for the disease to the miners themselves. They were held to be responsible for their occupational illness because of

their ignorance and carelessness in observing the dust precaution regulations. Such victim-blaming strategies were clearly unfair and lacked substance. As the miners claimed correctly, the prescribed dust preventives were ineffective. Also, some of the "wet" preventives even further endangered their health. But the state mine officials and the mineowners ignored the evidence of the miners, based on their own experience, in favour of managerial theory, which was frequently a less sound criterion of the efficacy of the measures.

Many mine managers both directly and indirectly encouraged miners to break the regulations. Unless mine managers met production and working-cost targets, prescribed by their controlling boards, they were in danger of losing their jobs.

The flat contract system, as practised on the Witwatersrand, also caused some miners to flout the regulations. By 1907 most miners were obliged to work under contract, which was a form of "speeding up". The contract enabled a fortunate few to earn handsome wages. But half of the the contractors earned only just under or over £1 per day, which was the daily rate accorded to skilled artisans, while the remainder earned less - sometimes nothing. Therefore in order to earn the equivalent of a day's pay some miner-contractors had no option but to ignore the regulations, the observance of which caused them loss of valuable time. In terms of the contract system

miners could be ordered to supervise three machines instead of the customary two. The miners were opposed to this, as they claimed that additional supervision entailed loss of time and hence loss of pay. Until the contract system was amended to guarantee miners a fixed daily minimum wage, it was difficult for miners to meet the dust precaution requirements without loss of pay. In contradiction to the popular notion, held by contemporaries and historians, we need to stress that that miners did not earn on average inordinately high wages.

The failure of the controlling parties to deal with silicosis had severe repercussions: Witwatersrand rock drillers continued to have an average working life of only seven years; and silicosis reduced the average working life of the general miners to fifteen to twenty years. In the face of such unabating mortality the mineowners built the "palace", Springkell, the sanatorium for handicapped miners, as an extravagant public relations gesture; and the Botha government carried out its promise - under Union - to award compensation to disabled miners. But such remedial measures, much extolled in popular histories, were only palliatives. The conquest of silicosis only began - much later - when the state and the mining houses began to co-operate with one another to eliminate the disease: the state passed stringent dust precaution regulations and the mineowners observed their "spirit".

The third conclusion concerns the responses of miners to the flimsy efforts of the state and the mining houses to curb the excesses of silicosis. The fear and anger of miners at being the victims of a preventable occupational disease provided the catalyst for their militancy during the period.

Of course miners had other grievances. One of their main complaints was that management abused the contract system. The miners alleged that mine managers in re-negotiating contracts lowered prices if, in their view, the previous contracts had yielded excessively high wages. The miners also claimed that management mis-measured feet or fathomages to their disadvantage. Management's handling of the contracts was therefore a major source of grievance to the miners, who believed that they were being cheated regarding their pay.

We have stressed the origins of the colour bar to show that the miners' initial demands for it stemmed from their materialism which was bolstered by a convenient belief in Social Darwinism with its rider of white racial supremacy. Further, the mineowners shared the miners' spurious safety rationale which underpinned the issue of the original legal colour bars. Like the miners, the mineowners believed that responsible positions involving the safety of other mineworkers should be entrusted solely to white workmen. By 1907, at the time of the miner's strike,

as in the past, the colour bar was still not dysfunctional to the mineowners. Within the confines of the colour bar, the mineowners were able to displace relatively highly paid white miners and so reduce costs, by increasing the ratio of black underground workers to white miners. This practice derived from management's experience with the employment of indentured Chinese labourers.

During the 1890s the miners had viewed their competitors as being the tiny semi-permanent and permanent proletarianised African workforce. But by 1907 the position was different. Miners now faced competition from the huge African migrant workforce. To obviate such competition, the miners urged the Botha government to extend the colour bar and to legalise a fixed ratio of white to black workers.

Such encroachment by Africans on the customary preserves of white miners resulted from the supervision system, with its rider of specialisation. The supervision system rendered the miners' intangible all-round skills redundant. Previously their versatility provided the basis for their claim to be skilled workmen. Supervision had originally caused miners on the Reef to be promoted in the labour hierarchy to "aristocrats of labour". But it also, ironically, fragmented their skills. By 1907 miners as supervisors were vulnerable to job displacement by semi-skilled African hand and rock drillers.

These grievances of miners concerning the insecurity of their pay and tenure coincided with insecurity relating to silicosis, and prompted them to strike in 1907. The miners' opposition to the three-drill system embodied all these grievances. In assessing the causes of the 1907 mine-wide strike, the miners' fears of disablement and death from silicosis have until now been under-estimated in the literature. We need to stress, too, that the miners' former sense of fatalism towards the disease had changed. By 1907 they wanted danger money and were prepared to strike for it.

The Transvaal Miners' Association, which had organised since its inception in 1902 on craft union lines and not on industrial lines, did not in 1907 on the eve of the strike, as other historians have asserted, consist of a mere 300 members. On the contrary, the miners' union was strong in numbers and in spirit. Such strength was all the more remarkable as each year amongst the union's executive membership there were numerous silicosis deaths.

As the notoriety of the Witwatersrand spread, overseas miners stayed away. Consequently management had no option but to employ South African born miners, who were poorly trained, to fill the vacancies. The popular myth is that Afrikaners entered the industry in large numbers only after they had been deployed as strike-breakers in 1907. This is not so. As early as 1902 Afrikaners began to enter the underground

semi-skilled and skilled workforce in slow but ever-increasing numbers. Undoubtedly the industry increased the size of its white workforce in absolute terms. Even so, in slowly growing numbers, Afrikaners filled the empty places.

The fourth conclusion pertains to the responses of the public to the problem of silicosis. The public barely, if at all, reacted to the mortality amongst miners. Until 1910 the industry was, in fact, sufficiently powerful to cause both the press and the medical profession to be silent about the devastations of the disease.

The press tended to be silent because it was controlled by the mineowners. But the response of the doctors, who were, indeed, apathetic towards the problem, is more complex. Many doctors were obliged to supplement their incomes by taking part-time appointments on the mines. They therefore experienced a conflict of interests which caused most of them to subordinate their commitment to their patients to the needs and interests of the gold mining industry. As significant, silicosis was not an infectious disease and posed no threat to public health. In a community such as that of the Witwatersrand, where wealth and power tended to coincide, the doctors, who at that time had a low standing as a profession, recognised that there was neither social prestige nor material profit to be gained from concern with a non-infectious disease which was confined to the working class.

The final conclusion relates to the impact of silicosis on African mineworkers. Long-service Africans, like their white counterparts, undoubtedly contracted accelerated silicosis. But such Africans constituted only a tiny fragment of the black underground labour force. Even so, the official figures for this form of the disease amongst the black mineworkers are at least two or three times too low. Disabled Africans were "shunted" off the mines or returned voluntarily, like the overseas white miners, to die at their own homes. The Africans who were most prone to accelerated silicosis were the "foreign" Africans, namely those who did not come from the British southern African territories.⁴ The vast majority of the "foreign" Africans were the Mozambican "East Coasters" who came from those Portuguese East African districts south of Latitude 22° South, namely Lourenço Marques and Inhambane situated south of the Save River.⁵

Amongst the "East Coasters", too, the prevalence of simple silicosis was higher than amongst Africans from other regions. There were three reasons for this. First, their contracts, which averaged eighteen months, were far longer than those of Africans from other regions. Second, they served several intermittent indentures during their life time, particularly in their prime. Finally, unlike most other Africans who tended to shun underground work, the "East Coasters" had a marked penchant - it was

tantamount to an ethnic speciality - for such tasks.

Although mine officials and health officers conceded that there was a high prevalence of a simple form of silicosis amongst African migrant workers, they asserted that it posed no dangers to these mineworkers: it did not, they claimed, develop into a handicapping form of the disease. The reason they gave was that the Africans' spells of rest between contracts - their "holidays" at their "kraals" - gave the workers the opportunity to regain their health and to overcome the temporary ill effects of dust exposure. There was no scientific evidence for this theory, which was based only on doctors' observations and experience. Even so, the mineowners both seized upon and promoted the unsubstantiated medical orthodoxy as an important rationale for perpetuating the migrant labour system.

In 1908 a British authority in occupational health, Sir Thomas Oliver, in referring to the problem of silicosis on the Witwatersrand, prophesied:

When the history of the development of the South African goldfields comes to be written, posterity is sure to pass severe strictures, not altogether unmerited from a medical point of view, upon the labour conditions that prevailed, and were allowed to continue so long unheeded.⁶

The truth is that Oliver was wrong. Until now history has taken his prophecy surprisingly lightly.

Notes

¹ *Evening Chronicle*, 4 Aug. 1913, "What the Miner Wants".

² *Reynolds Newspaper*, 8 Aug. 1913, "City of Dreadful Death".

³ *Star*, 23 Oct. 1989, "A tribute to miners and national development".

⁴ Van Niekerk, pp. 9, 28-31.

⁵ CAD, MNW, file MM 2489/25, extract from letter by João Bello, Minister for the Colonies of Lisbon, to Gen. J. B. M. Hertzog, 28 May 1927. I thank David Yudelman for drawing my attention to the reference.

⁶ Oliver, *Diseases of Occupation*, p. 292.

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⁴ This article is identical to the one that appeared a year earlier in the *Journal of Southern African Studies*, entitled "The Profits of Death: A Comparative Study of Miners' Phthisis in Cornwall and the Transvaal, 1876-1918".