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Title: **The Doctors' Dilemma: The Health Care of Workers on the Witwatersrand Gold Mines, 1892-1910.**

by: **Elaine N Katz**

No **361**

The Doctors' Dilemma: The Health Care of Workers on the Witwatersrand Gold Mines, 1892-1910[1]

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An issue as topical and controversial today as it was as the beginning of the 20th century is who does the doctor serve? Does he (or she) practise medicine to heal his patients, make a livelihood and attain status in society, or does he have a wider social function involving a duty to society and its restructuring with an accompanying responsibility for preventive health care? George Bernard Shaw, social reformer as well as dramatist, tackled this question in 1906 in 'The Doctors' Dilemma', which he described as a tragedy. In his preface to the play, written in 1911, he urged that medical services be reformed, because, as he argued, the object of the profession was 'not the health of the patient and of the community at large, but the protection of the doctor's livelihood and the concealment of his errors'.[2] South African doctors also faced this dilemma during the same period.

In the middle of 1901, shortly after the Witwatersrand gold mines had restarted operations, and while the Anglo-Boer War was still in progress, major health problems surfaced in the industry. By the time that peace was declared (in May 1902), the mortality from disease among white miners and African mineworkers had assumed such serious dimensions that Lord Milner, Governor of the Transvaal and High Commissioner of South Africa, was forced to intervene. Remedial measures were essential, the more especially as Milner's financial plans for the reconstruction of the Transvaal under British rule hinged largely on the 'overspill' from the gold mines.

This paper examines the responses of the Witwatersrand medical profession to the working and living conditions of white and African mineworkers both of which had a detrimental effect on their health. It also specifically analyses the reactions of these doctors to the excessive disease death rate among African mineworkers, chiefly from pneumonia, and to the high mortality from silicosis (miners' phthisis) which predominated among white miners, especially machine operators. It argues that the doctors, who were in a conflictual position, subordinated the needs of their patients (both black and white) for their own economic gain and to further the financial priorities of the mineowners, the so-called Randlords.

Health services before the Anglo-Boer War: the social context

The social context for the industry's early-day health services can be quickly sketched. By the early 1890s, less than a decade after the discovery of gold (in 1866), the Witwatersrand could by no means be described as a medical backwater. Nor was Johannesburg, the centre of medical practice, a typically crude mining settlement: as early as 1888 it had moved 'from the position of a digger's camp to that of one of the largest towns in South Africa'.[3] In 1898 it had a white population of at least 76,500, and a black population, including Africans, 'coloureds' (persons of 'mixed' descent) and Indians, of roughly double.[4] The total population was approximately ten times larger than that of Butte (30,000), then in its hey day, and acknowledged as the economic capital of Montana in the USA.[5] Johannesburg's suburbs were 'stately' and contained houses which cost from £1000 to £4000.[6] Such rapid progress was not merely material. Professional societies, including the Transvaal Medical Society, proliferated, and cultural activities, which were strengthened by the Transvaal's strong ties with Western Europe, catered for all kinds of tastes.

Despite its elements of sophistication, and although it was not a company town in

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[1] I thank Mrs Katherine Munro (Division of Economic History, University of the Witwatersrand, Johannesburg) for her helpful comments on my draft paper.

[2] Shaw, B., 'Preface on doctors', in The Doctor's Dilemma, Getting Married, & The Shewing-Up of Blanco Posnet, (London, rev. edn., 1932), pp. 66-67.

[3] Du-Val, C., 'All the world around!!! with pencil, pen, and camera', in M. Fraser, ed., Johannesburg pioneer journals 1888-1907 (Cape Town, Van Riebeeck Society, 1986), p. 23.

[4] Houghton, D. H. and Dagut, J., eds., Source material on the South African economy: 1860-1970, 3 vols., vol. 1, 1860-1899 (Cape Town, 1972), p. 289, (d); Public Health Department: annual report (Transvaal), 1906, p. 1.

[5] Malone, M. P., The battle for Butte: mining and politics on the northern frontier, 1864-1906 (Seattle and London, 1981), p. 56.

[6] London Mining Journal, 26 Aug. 1893, p. 943.

the strict sense of the word. Johannesburg nevertheless retained the ethos of a mining town. After all, the very reason for its establishment and continued existence was the gold mining industry. More than this, the industry not only maintained its dominance, but also increased it: most additional enterprises, industrial or other, were in one way or another connected to the mines. The entire community knew that all livelihoods, even those which did not impinge directly on the gold mines, depended on the success of the industry. What was good for the industry, the residents logically reasoned, could only be good for themselves. Consequently most of the Witwatersrand's inhabitants deferred to the policies and practices of the mineowners. These were expressed by their authoritative mouthpiece, the Chamber of Mines, and by the many newspapers they controlled or influenced. Nor were doctors immune to the power and propaganda of the Chamber: they, too, were often keen to further the interests of the industry.

Notwithstanding Dutch republican (Boer) rule, and the cosmopolitan composition of the town, British precepts infused this urban community that was largely English-speaking.[7] Doctors, too, were for the most part British-born and British-trained. Through their membership of the British Medical Association and by subscribing to overseas journals, the doctors kept abreast with current trends in Europe, especially Britain.[8] They also had close contact with medical practitioners in other parts of South Africa. In 1898 twenty-five (probably half) of the Johannesburg doctors joined the newly-founded South African Medical Association and hosted the organisation's first conference held in September that year.[9] It cannot therefore be argued that a lack of knowledge dictated their methods of practice.

The following examples show that the pioneer doctors were motivated, ambitious and generally of high calibre. Kendall Franks, a distinguished and innovative Irish surgeon, had glowing credentials and a fine practice even before he came to the Transvaal because of his wife's ill health. In 1904 he was knighted being the first South African doctor who was not a politician to receive this honour. Apart from private practice, he was honorary consultant to the Johannesburg hospital. He was also the major player in bringing about the establishment in the Transvaal of a branch of the British Medical Association and, when the South African Branch was formed, he was elected as its first president.[10] Edward T. Hamilton, also a surgeon and 'one of the most brilliant Guy's men of his day' (in 1895), conceived and initiated the Transvaal Medical Journal (in 1905) which he edited for several years, while still in general practice.[11]

When Milner needed to reform the health conditions of African workers he drew on the experience of other early-day doctors with equally impressive credentials. These included William H. Brodie, a graduate of Aberdeen, and Louis G. Irvine and Donald Macaulay, both graduates of Edinburgh. All had noteworthy careers and were prolific writers on a wide range of medical subjects. Together with several other pioneer doctors, Macaulay entered the political arena during responsible government, and he was elected to the Union House of Assembly in 1910. Irvine, an MD as early as 1901, became a leading specialist in the field of occupational health, more particularly silicosis.[12]

Not only did the Transvaal doctors have considerable medical skills, but they also brought with them British attitudes towards medicine in general, and towards occupational and industrial health in particular. These influenced their handling of medical issues on the Rand, particularly the problem of silicosis among white miners.

Silicosis is an incurable, often fatal, occupational disease caused by prolonged exposure to dust containing fine microscopic silica (quartz) particles. This lung disease has several manifestations, of which two are relevant: in its simple form it may develop slowly, in which case it is chronic: or it may advance rapidly.

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[7] Mathers, E. P., Golden South Africa or The gold fields revisited: being further glimpses of the gold fields of South Africa (London, 1888), p. 254.

[8] South African Medical Journal (SAMJ), Aug. 1894, p. 110, Dec. 1894, p. 226, Jan. 1895, p. 226, June 1897, p. 47, July 1897, p. 83, Nov. 1897, p. 196.

[9] SAMJ, Nov. 1897, pp. 199-201, April 1898, pp. 306-309.

[10] South African Medical Record (SAMR), July 1904, p. 139, 11 Aug. 1904, p. 145, 27 April, 1912, p. 160.

[11] SAMR, 13 March 1915, pp. 69-70; Medical Journal of South Africa (MJSA), March 1915, pp. 146-148, April 1920, pp. 217-218.

[12] Transvaal Medical Journal (TMJ), May, 1907, p. 192, May 1909, p. 207; SAMJ, 13 April 1946; MJSA, Jan. 1920, p. 154.

and is called accelerated silicosis. Neither form is infectious or contagious, but both to varying degrees cause physical impairment, and both reduce the sufferer's resistance to lung infections. When other lung diseases, particularly tuberculosis, occur in association with a relatively advanced form of silicosis, a new illness becomes superimposed on the old one, and is called progressive massive fibrosis. This disease, formerly known as 'complicated silicosis', is always disabling and is invariably lethal.[13]

Nineteenth-century doctors in Britain (as well as those in Europe and many other parts of the world) were familiar with chronic silicosis, an age-old lung complaint among workers in dusty occupations.[14] It was so commonplace among Cornish tin miners that doctors in Britain (as well as employers and successive governments) took the disease entirely for granted as one of the occupational hazards associated with metal mining.[15] Such dismissiveness was entirely compatible with their nonchalant approach to the working class. They assumed, quite wrongly, that workers had complete freedom to choose their occupations and in so doing took into account the accompanying risks.[16] By contrast, miners were fatalistic. They anticipated short working lives, and premature death at an average age of fifty.[17] Being fatalistic enabled miners to cope with the apathy of the controlling parties and the grim choice that confronted silicotics:[18] either they could give up their work 'in the very earliest stages of the illness' (the only advice which the medical profession could offer)[19] and face the prospect of unemployment, possibly starvation;[20] or they could continue working until the inevitable overtook them.

Government statistics confirmed the miners' morbid expectations. During the early 1880s the highest death rate from occupational disease occurred among Cornish tin miners: in each age group between twenty-five and fifty-five their mortality was on average six times higher than that of fishermen (who had a low death rate) and three times higher than that of coal and ironstone miners.[21] This, despite the fact that by 1880 medical research had already established the cause of silicosis and ways to prevent the disease: the use of water (to wet the dust at the point of production); and the provision of effective ventilation (to disperse the residual dust).[22] Such safeguards, particularly the use of water, had been effectively employed in the 1870s, when rock drillers excavated the St Gotthard Tunnel through the Alps between Switzerland and Italy;[23] and the same was true

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[13] Ziskind, M., Jones, Robert N. and Weill, H., 'Silicosis', American Review of Respiratory Diseases, 113, 1976, pp. 643-663 passim.

[14] Collis, E. L., Milroy lectures (1915): industrial pneumoconiosis with special reference to dust phthisis (London, 1919), pp. 2-7.

[15] Cd. 3389, 1864, Minutes of evidence taken before the commissioners appointed to inquire into the conditions of all mines..., vol. 9, part ii, p. 469, qq. 20,097-20,100, Dr E. Williams.

[16] Oliver, Sir T., Diseases of occupation: from the legislative, social, and medical points of view (London, 1908), p. 292.

[17] Cd. 3389, 1864, p. 24, q. 1680, D. Buzza; Collis, Milroy lectures, pp. 7-10.

[18] Report of the [Transvaal] Miners' Phthisis Commission, 1902-1903 (RMPC, 1902-1903), p. 108, qq. 873-874, T. McIsaac.

[19] Oliver, Sir T., 'Gold miner's [sic] phthisis and some of the dangers to health incidental to gold mining in the Transvaal', Lancet, 14 June 1902, p. 1679. See also Irvine, L. G., 'Bacteriological and other aspects of miners' phthisis'. Report of the South African association for the advancement of science, held at Johannesburg, April 1904, p. 235; and van Niekerk, S. V., 'Miners' Phthisis on the Witwatersrand' (MD. thesis, University of Aberdeen, 1914), p. 269.

[20] Star, 3 Dec. 1902, letter; Transvaal Archives Depot (TAD), Secretary of Mines (MM), 1395/06, 22 May 1906, 'Deputation from Transvaal Miners' Association'; Transvaal Leader, 18 Aug. 1910, letter.

[21] Cd. 2091, 1904, Report to the Secretary of State for the Home Department on the health of Cornish miners, pp. 5, 6; RMPC, 1902-1903, appendix A, table E.

[22] Oliver, Sir T., 'A discussion of miners' phthisis', British Medical Journal, 12 Sept. 1903, p. 568; Rosen, G., The history of miners' diseases: a medical and social interpretation (New York, 1943), pp. 362-372 passim, 380-381; Collis, Milroy lectures, pp. 5-6.

[23] Rosen, History of miners' diseases, , p. 421. The Times, 13 Oct. 1902, letter.

when the Simplon Tunnel was constructed in the 1890s.[24]

The reasons for the apathy of the state, the employers and health officers towards the plight of metal miners in Britain do not concern us here. What is important is that British doctors transported to South Africa their indifference to a non-contagious working-class illness. And coincident with the arrival of doctors in the Transvaal, technologies were introduced on the Witwatersrand gold mines which substantially heightened the already considerable dust densities. In the absence of dust preventives, the new machine drills, together with huge labour-intensive squads, produced conditions that were conducive to a more dangerous form of silicosis; accelerated silicosis maimed and killed machine operators, known as rock drillers, within seven years of their commencing work. By turning a blind eye to the industry's failure to protect its workforce, the Witwatersrand medical profession condoned the disablement and premature death of hundreds of miners.

The economic context

This socio-medical setting in the Transvaal was strongly influenced by economic circumstances; in particular the nature of the industrialisation process on the mines, including the division of the workforce along black-white racial lines. The industry's production methods and employment practices, instituted during the Transvaal republican era (1892 to 1899) under the presidency of Paul Kruger, continued to be implemented, albeit with added vigour, throughout the reconstruction era under Milner and his successors (1902 to 1907), and during the period of Transvaal responsible government under Het Volk with Louis Botha and Jan Smuts at the helm (1907 to 1910). Indeed, so strong were the pioneer industrial structures that they remained in force from the establishment of the Union of South Africa in 1910, also under the political leadership of Botha and Smuts, right up to the outbreak of World War One in 1914.

Following the discovery in the early 1880s of small-scale gold deposits in the eastern Transvaal, beginning in 1885 the huge finds on the Witwatersrand were made. The 19th century had witnessed a world-wide expansion of gold production. After the 1849 Californian gold rush, new gold deposits were found in many other parts of the USA, in Australia (in New South Wales and Victoria), in New Zealand (in Queensland), in Canada (in the Klondike), and in South America, and in Alaska. In similar vein, Russian gold mining steadily expanded eastward from the Urals to Siberia.[25] Not surprisingly, the value of the world's total gold production rose sharply: from six million pounds in 1849 to thirty million in 1860.[26] Yet the most important gold strikes were unquestionably those of the Witwatersrand. By 1895, within a mere ten years of their discovery, the Transvaal had become the world's top gold producer. Gold from the single region of the Witwatersrand, valued at approximately eight and a half million pounds, yielded roughly one-fifth of the globe's total annual gold output.[27]

This massive output was achieved for two reasons: the unique nature of the deposits: and the use of 'scientific' techniques to exploit the gold. The deposits were huge and extensive. On the surface, the quartz outcrops, in which the beds of gold had been first discovered, stretched in a reasonably straight east-west line for approximately 40 miles. It was also soon found that payable gold persisted at depth, on a gently sloping plane, for at least five miles to the south of the outcrops.[28] Not only were these ore deposits far larger and

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[24] Macaulay, D. and Irvine, L. G., 'Safety Measures in Mining', Journal of the Chemical, Metallurgical and Mining Society of South Africa, April 1906, p. 297; The Times, 13 Oct. 1902, letter; Journal of the Chemical, Metallurgical and Mining Society of South Africa (JCMMS), Sept. 1906, p. 81, E. M. Weston.

[25] Morrell, W. P., The gold rushes (London, 1940), passim; Rickard, T. A., Interviews with mining engineers (San Francisco, 1922), passim.

[26] Hatch, F. H. and Chalmers, J. A., The gold mines of the Rand: being a description of the mining industry of Witwatersrand South African Republic (London, 1895), p. 5; Goldmann, S. C., South African mines; their position, results, and developments; together with an account of diamonds, land, finance and kindred concerns, 3 vols., vol. 1, Rand mining companies (London, 1895/1896), p. vi.

[27] Goldmann, Rand mining, p. vii.

[28] Denny, G. A., The deep-level mines of the Rand and their future development considered from the commercial point of view (London, 1902), pp. 28-9; Truscott, S. J., The Witwatersrand goldfields' banket and mining practice: with an appendix on the banket of the Tarkwa goldfield, West Africa (London, 2nd rev. edn., 1902), p. 3, and diagram facing p. 100. The beds of gold, known as reefs, dipped sharply at the surface, but at a vertical depth of approximately 1500 feet they flattened and continued their inclined descent at an average angle of only 1° per 1000 feet. See Goldmann, Rand mining, p. xiv; Letcher, O., The gold mines of Southern Africa: the

more extensive than those in any other auriferous area in the world, they were also more regular and more uniform. With justification a contemporary mining expert marvelled: 'Compared with the Rand conglomerates, all other gold-mines are but sporadic little flukes.'[29]

In 1892 the industry began 'to take off' largely because of two findings that occurred almost simultaneously: the confirmation that payable gold existed at depth: and the proof that pyritic ores, which up to this point had been refractory, yielded 90 per cent of the gold when treated with the newly developed MacArthur-Forrest cyanide process.[30] Financed by British, French and, to a lesser extent, German capital, the mineowners reconstructed the original rudimentary outcrop mines and developed the so-called deep level mines.

The mines were organised under a group corporate structure, most mines falling under one of nine mining houses. It was through these mining houses that venture capital was raised on the share market of the world. The London-based private company, Wernher, Beit and Company, controlled two of the mining houses, H. Eckstein and Company (its holdings were largely outcrop mines), and Rand Mines, Limited (its holdings were deep level mines), a subsidiary of Eckstein's. This finance company, known locally as the Corner House, was by far the largest corporation.[31] The nine mining houses financed and administered the scientific exploitation of the mines, both outcrop and deep level, by underground mining techniques applicable to deep, hard-rock mines.[32]

This transformation of the industry was effected by best-practice technology, brought to the Witwatersrand from all over the world by highly paid mining professionals, amongst whom US nationals predominated. Many of these experts had both academic skills and world-wide practical experience. Such professional expertise was linked to the 19th century global proliferation of metal mines, especially gold, tin, iron, and copper. Improved ore-extraction techniques together with technological strides in all the associated mining and engineering sciences not only boosted the productive capacities of the new-found mineral deposits, but also enabled them to be mined at far greater depths than before.[33]

The Witwatersrand underground mines required a much larger workforce than the earlier rudimentary mines. This was not simply because the mines were enlarged. A more important reason for large-scale production was the mineowners' determination to mine low grade pyritic ore at a profit. The Witwatersrand ore fluctuated between high, medium and low grades, but its average was a mere 6.5 dwts. (pennyweights) per ton. This was far less than the average values of 12 dwts. per ton being mined in Australia and North America. The mineowners might have found it easier to make profits by 'picking the eyes' of the mines. They were not, however, prepared to mine selectively: it would mean abandoning vast low grade reserves: it would shorten the lives of the mines: and it would possibly make the capital costs of opening and developing new mines unjustifiable. Instead, they decided to mine richer ores in conjunction with

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history, technology and statistics of the gold industry;... (London, 1936), p. 109; and Davies, D. C., A treatise on metalliferous minerals and mining (London, 6th rev. edn, 1901), pp. 32-90 passim.

[29] Taylor, W. P., African treasures: sixty years among diamonds and gold (London, 1932), p. 41.

[30] Katzenellenbogen, S., 'Cyanide and bubbles: aspects of technological change in gold and nonferrous metals treatment', in K. Tenfelde, ed., Towards a social history of mining in the 19th and 20th centuries (Munchen, 1992), pp. 522-524. See also Grav J. and McLachlan, J. A., 'A history of the introduction of the MacArthur-Forrest cyanide process to the Witwatersrand goldfields', Journal of the Chemical, Metallurgical and Mining Society of South Africa, 1932/1933, pp. 375-376.

[31] Transvaal Chamber of Mines, Annual Report (TCMAR), 1902, annexure, exhibits 1, 4(A)-(F); Fraagh, L. V., (ed.), The Transvaal and its mines: the encyclopedic history of the Transvaal (London, [1906]), pp. 602-603, 606.

[32] London Mining Journal, 26 Aug. 1893, p. 943. For scientific details, see Hatch and Chalmers, Gold mines, pp. 113, 122-3, 132-6; and Truscott, Witwatersrand goldfields, pp. 123, 125, 340, 356-67.

[33] Cartwright, A. P., The Corner House: the early history of Johannesburg (Cape Town and Johannesburg, 1965), pp. 97-8; de Waal, E., 'American technology in South African gold mining before 1899', Optima, 32 (2) 1985, pp. 88-96 passim; Hatch and Chalmers, Gold mines, pp. 104-5; Hull, R. W., American enterprise in South Africa: historical dimensions of engagement and disengagement (New York University Press, 1990), pp. 63-5; Rickard, Interviews, passim, but especially pp. 229-230; Todd, A. C., The Cornish miner in America (Truro, 1967), passim.

poorer ones, and so 'get every ounce of gold which is in the ground out of it'.[34]

The profitable mining of low grade ore was extremely difficult during this period, when most of the world was on a gold standard. Although the demand for gold was unlimited, the gold price was fixed, and any increase in the cost of gold production reduced profits or even made some gold deposits too costly to work. Under such conditions the Witwatersrand industry could be viable only if huge tonnages were milled: nearly three tons of ore had to be excavated and processed to extract a single ounce of gold. The profitability of the gold mines therefore depended not only on the yield of gold per ton, but also on the working costs per ton of ore. Thus mass production and reduced working costs became the primary objectives of the industry. And it was to these idols that the entire hierarchy of management deferred: the directors of the nine mining houses; the consulting engineers; and the mine managers.

Had these extremely difficult ore bodies been situated anywhere else in the world, it is quite possible that they would not have been developed. Yet on the Witwatersrand the combination of capital, mining house structure, technology, and labour, was uniquely organised so that they could be exploited profitably.

Dividends paid by the Witwatersrand mines often did not live up to investor expectations, and many believed this was because the mining houses retained a very high proportion of the profits. But as the economist, Professor S. H. Frankel, has since calculated, the retention of profit between 1887 and 1914 amounted to a mere 2.1 per cent.[35] The relatively low dividend returns on gold explain why the mineowners constantly griped about their difficulties in raising fresh or additional capital, and why they were obsessed with reducing their working costs, especially those associated with labour.

The workforce: particularly underground workers

As both black and white underground mineworkers were far more prone to disease and death than their counterparts who worked on the surface, the composition, size and labour arrangements of the underground workforce need discussion. This begins with a note on terminology.

'Mineworkers' is the generic term for wage-earners on a mine. In the past social scientists tended to apply the term solely to white wage-earners. Today it is also applied to the African workforce. (The terms, African or black, distinguish these workers from their white counterparts.)

At the turn of the 20th century African mineworkers were officially called 'natives', 'labourers', 'kaffirs' and 'boys'. The term 'coloureds' was ambiguous. Occasionally it specified Africans, while at other times it covered all members of the industry's workforce who were not white: it was used inclusively to denote Africans (blacks), Indians, Chinese, and so-called 'coloureds'. Almost 80 per cent of the African workforce was employed underground.[36] It was among these workers that the disease death rate, particularly from pneumonia and tuberculosis, was most severe.[37]

In agreement with earlier usage, this paper refers to the industry's white workforce as 'mineworkers', 'workers', 'workmen' and 'men'. The word 'mineworkers' covers a wide spectrum of white wage-earners: the skilled professional miners and the nominally semi-skilled trammers (responsible for ore-removal tasks), together with the skilled artisans and the semi-skilled machine operatives.

The Witwatersrand mines employed far more artisans proportionally than did mines in other parts of the world. Instead of subcontracting jobs to outside engineering firms, which was common practice elsewhere, the Witwatersrand mines had huge workshops employing large numbers of craftsmen.[38] On the Rand

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[34] TG 2, 1908, Mining industry commission: minutes of evidence, p. 113, q. 855, L. J. Reversbach.

[35] Frankel, S. H., Gold and international equity investment (London, 1969), p. 20.

[36] TG 2, 1908, p. 879, qq. 12,687-12,688, W. T. Anderson.

[37] Irvine, L. G. and Macaulay, D., 'The life history of the native labourer', Addresses and papers read at the joint meeting of the British and South African association for the advancement of science in South Africa, 1905, III, p. 364.

[38] Browne, R. E., 'Working costs of the mines of the Witwatersrand', Proceedings of the South African Association of Engineers, XII, 1906-1907, pp. 332-333.

therefore artisans outnumbered miners by at least two to one.[39] Although a substantial number of artisans worked underground either on a temporary or on a permanent basis, they nevertheless regarded themselves as surfacemen.[40]

The expressions 'miners' and 'mineworkers' should not be used interchangeably. The term 'mineworkers' embodied all grades of white labour, whereas 'miners' were specialists in mining operations. The miners were a separate professional category of workmen who, apart from their distinctive training and tasks, had few common interests with most other underground workmen (chiefly artisans and semi-skilled operatives) and even less with surfacemen. The miners comprised approximately one-third of the total white workforce and just over half the underground white workforce.[41] The disease death rate among the white workforce was on average relatively low.[42] But it was extremely high among one discrete segment, the miners. Huge numbers of them were afflicted by silicosis.[43]

Ever since the inception of the industry, management (following the precedent of deep diamond mining at Kimberley) deployed its workforce on black-white racial lines, a divide which it justified by the level of skills that each race initially possessed. Highly paid overseas professional miners, the vast majority of whom were British-born, supervised unskilled African migrant workers. The black workers, who came from virtually all the southern African regions, but especially from the Portuguese East African territories, south of Latitude 22° south - the so-called 'East Coasters' - earned wages which were a fraction of those earned by white workmen.[44]

To justify these labour arrangements the Randlords quoted the Social Darwinist concept of evolution with its ancillary of black racial inferiority, which was claimed to be a biologically determined condition. This plausible theory held wide sway at the time, and its numerous adherents included Europeans (and persons of European descent) belonging to all classes and professions.[45] The notion of white racial supremacy found fertile ground in South Africa with its relatively lengthy experience of slave owning and its legacy of 17th century Calvinist doctrines. Nor was the British Colonial Office immune to such theories. Its commitment to ostensibly commendable principles of duty and trusteeship towards the African peoples under its governance was more often than not rhetorical. Indeed, such paternalism, used to justify British imperialism, was redolent of Social Darwinism.[46] Accordingly, supporters of the industry, including doctors, endorsed the views of Hennen Jennings, the American consulting engineer to the largest mining company, the Corner House:

> The history of this country [the Transvaal], as well as that of others where white and black are thrown together, clearly proves that the white is the superior race mentally, and that the black should recognise it. In other words it is the natural attitude of the white man to feel his superiority, and relegate to the black the lower grade of manual work...
>
> Thus, to obtain the maximum population, intelligence and contentment, work among the whites must be confined to skilled departments where brain tells, and the mere muscular work apportioned to races willing to be considered inferior, and to work cheerfully for wages far below the scale required by the white population to support their families

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[39] Calculations based on: Rapport van den Staats-Mijningenieur, 1896, 1897, 1898, statement 7; TG 2, 1908, pp. 83-84, annexure E; TCMAR, 1895, 1896, 1897, 1898, pp. 180, 272, 406b, 407; and TG 11, 1908, Minutes of evidence of the Transvaal indigency commission, 1906-1908, p. 404.

[40] TG 2, 1908, p. 711, q. 10,101, W. H. Andrews.

[41] For statistical details, see Katz, E. N., 'Miners by default: Afrikaners and the gold mining industry before Union', South African Journal of Economic History, 6 (1), March 1991, pp. 63-66.

[42] Final Report of the [Transvaal] Mining Regulations Commission (FRMRC), 1910, 2 vols., vol. 1, p. 34.

[43] Katz, 'Miners by default', pp. 75-79; FRMRC, 1910, vol. 1, pp. 33-37.

[44] After 1897, when the wages of Africans were reduced by one-third, the customary wage of a skilled white workman was £1 per day, whereas the average maximum wage of the unskilled African worker was 2s. 3d.

[45] Gould, S. J., The mismeasure of man (London and New York, 1981), pp. 73-74, 115-118, 120, 162, 227, 322-326.

[46] See, for instance, Public Record Office (PRO), Colonial Office (CO), 291/42, despatches, Milner to Chamberlain, 8 Sept. 1902, minute, 7 Jan. 1903.

in the condition of affairs obtaining in this country.[47]

The ever-growing supply of skilled whites and unskilled African workers matched the rapid expansion of the industry. In 1893 there were approximately 4,000 white and 29,000 black mineworkers, whereas in 1899 they totalled 11,000 and 97,000.[48] Except in 1899, on the eve of the Anglo-Boer War, when the ratio of blacks to whites was as high as nine to one, the 1893 ratio of seven to one was constant for most of the pre-war period. And in 1905, when the industry re-attained its pre-war production levels, this ratio once again became the norm.[49] Seven to one was not, however, the rule either on the surface or underground. On the surface it was approximately four to one, whereas underground it was roughly twelve to one.[50] The bulk of the workforce was therefore employed underground.

No mining centre in the world could boast of mines which on average employed workforces of comparable size with those of the seventy-nine Witwatersrand mines that were producing in 1899. In the early 1890s, at the peak of its copper production, the celebrated Anaconda Mining Group of Butte towered above all other US mining operations. Yet, despite its 3000 employees, and its acclaimed output, the Anaconda was only a 'medium' size operation by Witwatersrand standards. The same contrast was true of British metal mines: a mine considered to be 'small' on the Witwatersrand was 'enormous' in comparison with a mine ranked as 'big' in Britain.[51]

More important than the size of the underground workforce was the way it was organised. Mass-production techniques were implemented so efficiently that on each mine the underground workers were mobilised more like soldiers than factory hands. Under white supervision, gangs of twenty to thirty African hand-drillers, or parties of five African rock drillers manning two machines, prepared the holes for blasting by the professional miner. Likewise, ore-removal tasks were performed by large squads of Africans under the direction of the white semi-skilled gangers. Such arrangements, which promoted 'speeding up', were unique, as a Witwatersrand mine manager illustrated:

> There is no comparison between Cornish mining and ours, in fact there is no comparison in the wide world with the Rand. We get through more ground here in a week than most miners in other countries do in a month. Here it is push and drive and worry from the time the shift goes down until it is up again, whilst in other mining centres there is mostly ample leisure to do things in a more deliberate manner.[52]

This concentrated mining, this combination of labour-intensive methods and powerful machines drills, produced dangerous silica dust and poisonous gases in quantities at least 'ten times' in excess of those produced in metalliferous mines in England (and probably elsewhere).[53] Similarly, the large teams, in which workers laboured in close proximity to one another, encouraged the spread of infectious diseases far more rapidly than in other mining centres, where miners worked in small solitary parties or in pairs. Although the Witwatersrand's workforce was divided into two groups by race and colour, by different control mechanisms, and by artificial definitions of skills, which were the bases for wage differentials, black and white mineworkers nevertheless shared the singularly unhealthy underground workplace.

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[47] Corner House Archives (CHA), White Labour File (WLF), H. Jennings to R. Schumacher, 1 Jan. 1904. This file is currently housed in the Barlow Rand Archives, but its contents, which have not yet been sorted, are not available for public use.

[48] TCMAR, 1893, p. 182; Transvaal Chamber of Mines Archives (TCMA), file W6(c), F. H. P. Creswell to Secretary, Transvaal Chamber of Mines (TCM), (Sept.) 1902, appendix A.

[49] TG 2, 1908, pp. 7, 9, 89, qq. 99, 136, and annexure K. H. Weldon.

[50] TG 2, 1908, p. 879, qq. 12,687-12,688, W. T. Anderson; Letter Book of City Deep Limited, 1910-1911 (in the private possession of E. N. Katz), J. Whitford to H. S. Martin, 15 Dec. 1910.

[51] Malone, Battle for Butte, p. 41; Cd. 7478, 1914, Minutes of evidence taken before the royal commission on metalliferous mines and quarries, vol. III, p. 202, qq. 25,046-25,060, G. G. Hewitt. A Witwatersrand mine of medium size had a total workforce of approximately 2,800 workers. See TCMA, file W6(c), S. Jennings to Secretary, TCM, 6 Oct. 1902, enclosure in State Mining Engineer's report for the Witwatersrand district; and UG 34, 1911, Mines Department, Interim report, 31 December 1910, pp. 39, 74-75.

[52] JCMS, Oct. 1906, p. 114, M. H. Coombe.

[53] FRMC, 1910, vol. 2, p. 89, Dr J. Moir.

Hygiene on the mines during the Kruger era: ventilation; sanitation; and change houses

During the Kruger era the poor ventilation and the almost complete absence of sanitation facilities heightened the incidence of silicosis and exacerbated the spread of infectious diseases. All this was compounded by the dearth of efficient change houses.

The republican ventilation laws, like the European and British measures on which they were based, were designed to prevent fiery accidents. Accordingly, their intention was to supply the underground workings with fresh air sufficient to dilute noxious and inflammable gases, and to remove the vitiated air.[54] The detailed laws framed to meet these requirements were 'eminently reasonable', even by today's standards.[55] But the problem was that they were never enforced.[56] Relying on the assurances of management, the republican Department of Mines presumed that the natural ventilation of the mines was as effective on the Witwatersrand as it was in metalliferous mining districts elsewhere in the world.[57] Such confidence was misplaced: the Witwatersrand's climate and altitude caused the natural ventilation of the gold mines to be largely ineffective.[58]

Certain mining engineers acknowledged the critical absence of air, particularly in the blind ends of development tunnels, and advised that supplementary mechanical ventilation be installed.[59] But the mineowners ignored the confidential recommendations of their own experts, because it 'would have meant an increase in working costs'.[60] If anyone thoroughly understood the situation, it was surely the former British mining inspector who had himself framed the republican ventilation laws. Many, especially miners, endorsed his indictment of the mineowners' parsimony:[61] 'The blind ends cannot strictly be said to be ventilated in the spirit of the...regulations'.[62]

Before the Anglo-Boer War, the sanitation of the mines was equally deplorable. As there was no medical official to supervise health conditions on the mines, the sanitary arrangements were left entirely to management, who did nothing about them.[63] None of the outcrop mines and only a sprinkling of deep level mines had 'privy accommodation'. Against the expectations of management, miners would not (or could not) avail themselves of the remote surface latrines. Instead, they relieved themselves - and Africans followed suit - in the disused workings and the ore-boxes, which were nearby.[64] This caused excreta to be 'constantly brought in contact with the employees': it was mixed with the ore raised from the mine; it was blended with the water circulating through the mine; and it mingled with the water pumped to the surface for use on the sorting floors, mills, and

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[54] ZAR, Wetten, 1896, no. 12, sections (42), (53), (54), (55), (56), 1897, no. 11, sections (42), (53), (54), (55), (56), 1898, no. 12, sections (41), (52), (53), (54), (55); TDMAR, 1892, p. 69; RMPC, 1902-1903, p. 90, A. R. Sawyer.

[55] Martinson, M. J., 'Occupational health and safety in underground mines', Journal of the Mine Ventilation Society of South Africa, Jan. 1976, p. 12.

[56] RMPC, 1902-1903, pp. xiv-xv, par. 40; Martinson, 'Occupational health', p. 9.

[57] See, for instance, Hatch and Chalmers, Gold mines, p. 385; and Truscott, Witwatersrand goldfields, pp. 387-388. For a discussion on natural ventilation, see Johnson, T., 'The ventilation of deep levels', Journal of the Chemical, Metallurgical and Mining Society of South Africa, July 1903-June 1904, pp. 44-51 passim.

[58] FRMPC, 1910, vol. 2, p. 95, Dr J. Moir; Cd. 7478, 1914, pp. 155, 162, qq. 23,978, 24,155, H. F. Marriott.

[59] See, for instance, RMPC, 1902-1903, p. 132, q. 1308, E. P. Rathbone; and Marriott, H. F., Money & mines: the administration, organisation and economics of precious and non-ferrous metal mines (London, 1925), pp. 62-65.

[60] Marriott, Money & mines, pp. 62-65. See also Barlow Rand Archives (BRA), Hermann Eckstein (HE), vol. 286, file 250V, no. 32, vol. 162, H. Schumacher to H. F. Marriott, 29 Nov. 1907.

[61] See, for instance, RMPC, 1902-1903, p. 109, q. 707, G. Blight; and TAD, MM, 1395/06, 22 May 1906, 'Deputation from the Transvaal Miners' Association'.

[62] RMPC, 1902-1903, p. 88, A. R. Sawyer.

[63] Government Mining Engineer: Annual Report, (GMEAR) 30 June 1902, p. 7.

[64] RMPC, 1902-1903, pp. xvii, xix, pars. 57, 58, p. 82, qq. 538, 589, W. Moses.

other workings.[65]

The virtual absence of hygienic facilities exacerbated the harmful effects of the odious sanitation. Following European and British precedent, the Kruger government enacted a law stipulating the provision of change houses:[66] suitably warmed buildings, equipped with amenities and ablution facilities, in which workmen could change and dry their workclothes. But as the law was not enforced (there was no penalty for its infringement), it was meaningless. Only a smattering of mineowners built 'efficient ones'.[67] Most, for reasons of cost, refused to provide change houses voluntarily.

Change houses for Africans, even if they were only bare sheds, were a rarity. Nor did the law did stipulate their provision. As the Africans wore only a loin cloth at work, state officials (and management) believed that they did not need the facility.[68]

In the absence of change houses, and without conveniences to dry their clothes in their living quarters, miners were forced to wear sodden clothing to and from work. Not surprisingly, they regularly caught colds, the consequences of which were often serious, sometimes fatal: the colds irritated the lungs, and heightened the miners' vulnerability to pneumonia and tuberculosis. These were especially dangerous infections, if the lungs were already severely damaged by dust. The miners' wet, dirty and 'perhaps faecally contaminated working clothes', usually stinking of nitrous fumes, polluted their living quarters, which in their own right were often a major source of a variety of infections.[69]

Living conditions on the mines

The underground disease problems caused by deficient ventilation, unhealthy sanitation and the absence of hygienic amenities, were compounded by the poor living conditions of both black and white mineworkers. They, too, provided conditions that were conducive to the spread of infectious diseases, notably pneumonia and tuberculosis. Although the accommodation of whites was superior to that of Africans, white mineworkers, particularly miners, certainly did not enjoy salubrious living facilities.

Most Africans were poorly housed and badly fed in the barrack-like compounds. A doctor, who thought their overcrowded living conditions were conducive to pneumonia epidemics, described them to illustrate his point:

> They [15,000 natives] were housed, as is the usual rule, in compounds, in huts built round the four sides of a space. The huts were all of one type and were practically all under one long roof interrupted here and there. They were divided laterally from each other by galvanised iron partitions. Each hut opened on the space by a doorway. Space for ventilation was obtained by the back wall not being carried quite up to the roof, which provided a fair cross draught. The sleeping bunks [approximately 50 to a hut] were round the walls, away from the door, in two tiers. Very little sunlight and not much diffuse daylight gained access to the interior of the huts except through the low pitched doorway.[70]

The 'single' men, so lodged, were usually migrant workers, who served short contracts ranging from three months to a year, at the end of which time they returned to their rural homesteads.

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[65] Ibid., p. xviii, par. 56.

[66] ZAR, Wetten, 1896, no. 12, section (149), 1897, no. 11, section (149), 1898, no. 12, section (149); RMPC, 1902-1903, p. xix, par. 62.

[67] RMPC, 1902-1903, p. xix, pars. 59, 61, 62.

[68] FRMRC, 1910, vol. 1, p. 70: Council minutes of the Association of Mine Managers (AMM), 4 June 1906.

[69] RMPC, 1902-1903, p. xxi, par. 70, pp. 109-110, qq. 903, 922, G. Blight: Macaulay and Irvine, 'Safety Measures' April 1906, pp. 331-333; JCMM, May 1906, p. 338, Dr J. C. McNeillie.

[70] Waldron, F. W., 'Epidemic pneumonia, with special reference to its infectious nature in native compounds', South African Medical Record, Feb. 1904, p. 30. See also Baker, Julie J., '"The silent crisis": black labour, disease, and the economics and politics of health on the South African gold mines 1902-1930' (unpublished Ph.D. thesis, Queen's University at Kingston, Ontario, 1989), pp. 18, 27-28; and Jeeves, A., 'The control of migratory labour in the era of Kruger and Milner', Journal of Southern African Studies, Oct. 1975, p. 16.

Little provision was made for African married men who had their families with them. Almost every company supported a tiny group of them in the so-called 'locations' adjacent to each mine. A number of location dwellers were 'long-service' Africans, who stayed on the mines for three years and longer.[71] The 'long-service' Africans, most of whom were 'East Coasters', were spared the congested, often vermin-infested, dormitories, which promoted the spread of infections.[72] But, like the white miners, they were vulnerable to silicosis because of their lengthy and continuous exposure to intense dust densities.[73]

The majority of white miners were also 'single' and transient workers. The most important reason for this form of existence was the problem of housing. The rentals for private lodgings were exorbitant compared with those at mining centres elsewhere in the world,[74] and company housing, though cheap, was insufficient for the demand. Although the industry provided tiny, crude, two-room, semi-detached cottages for married men, they were not only in very short supply, but they were also rarely made available to miners, as opposed to artisans.[75]

Most miners therefore had no option but to fall back on the so-called 'single quarters' which afforded enough rooms for the industry's entire white workforce, provided they were single.[76] These were tacky wood and iron dormitories 'dumped upon the bare red earth without a single tree or shrub to give any idea of privacy...[or] to hide [their] hideous nakedness'. The barrack-like buildings, large oblong boxes roughly 80 yards in length, were divided in two down the middle, with each half partitioned into approximately twenty rooms. Two men, at a nominal cost of 5s. or 10s. each per month, shared the tiny bare rooms; they were unfurnished, except for beds, and had no amenities such as running water, stoves, and heating.[77] A miner complained: 'They are not much better than the compound. They are built about 12 ft. x 12 ft., and there is no height to speak of - about 10 ft.'[78]

More important than their lack of comfort and physical repulsiveness, the 'single quarters' were exceptionally unhygienic; the 'wretched' rooms were badly ventilated and infested with insects and vermin.[79] As the workmen correctly recognised, they were as deadly a source of infections, particularly tuberculosis, as were the underground workings.

A feature of migrancy, which the overseas professional miners shared with their African counterparts, was their propensity when sick or dying to return home to be cared for by their kin. Like the African migrants who died anonymously in the countryside, many white miners were laid to rest in the 'Kraals of the North' in Britain.[80] The desire to be healed 'at home' was the common response of both black and white mineworkers to the poor health and medical care that they

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[71] The mining industry: evidence and report of the industrial commission of enquiry (Johannesburg, Witwatersrand Chamber of Mines, 1897), p. 43. E. J. Way: TCMA, file W6(c). T. J. Britten to Secretary, TCM, 11 Sept. 1902.

[72] Lancet, 2 May 1914, p. 1282.

[73] Van Niekerk, 'Miners' phthisis', pp. 111-131 passim.

[74] Private rentals on the Witwatersrand averaged between £72 to £120 per annum and accounted for between one-third and one-half of the workman's yearly income. By contrast, the rents for similar dwellings in Britain, ranging from £10 to £15 per year, accounted for only one-sixth to one-tenth of the miner's annual income. See Burt, T., A visit to the Transvaal: labour: white, black and yellow (Newcastle-upon-Tyne, 1905), pp. 42-43; Worsfold, W. B., The reconstruction of the new colonies under Lord Milner, 2 vols., vol. 1 (London, 1913), pp. 278-280; TG 2, 1908, pp. 316, 341, 519, qq. 2980, 3318, 6048, S. S. Crowle, C. C. Smith and E. Moore.

[75] CHA, WLF, L. P. Cazalet to L. Phillips, 27 Oct. 1906; Letter Book of City Deep Limited, 1910-1911, J. Whitford to Secretary, Rand Mines, 12 Nov. 1910, J. Whitford to Chairman and Directors of City Deep Limited, 8 Feb. 1911.

[76] Cd. 1895, 1904, Further correspondence relating to the affairs of the Transvaal and Orange River Colony, p. 204, Lawley to Lyttelton, 18 Dec. 1903.

[77] Anonymous, 'The Gloom of the Mines', State, August 1910, pp. 267-268; RMPC, 1902-1903, p. xix, par. 69; Mining industry, 1897, pp. 299, 304, A. B. Fyffe; TG 2, 1908, qq. 110, 199, qq. 795, 1967, L. J. Reversbach and G. E. Webber.

[78] TG 2, 1908, p. 523, q. 6152, E. Moore.

[79] Rand Daily Mail, 16 July 1912; TG 2, 1908, pp. 318, 519, qq. 3004, 6152, S. S. Crowle and E. Moore; CAD, MNW, file MM, 1106/10, Assistant Secretary of Mines to Deputy Inspector of Mines, Krugersdorp, [April] 1910; FMRC, 1910, vol. 1, pp. 64-65.

[80] South African Mines, Commerce and Industries, 2 May 1904, p. 226.

received on the Witwatersrand.

Health care during the Kruger era: the state; the industry; and the medical profession

During the 1890s, the controlling parties - the state, management, and the medical profession - were well aware that there were serious health issues connected with the industry. Yet all three bodies were impervious to them, because the problems neither impeded the growth of the industry nor disrupted the flow of labour, particularly African. The government of Kruger, cognisant of the industry's financial importance to the Transvaal, nurtured the industry in many ways even from its infancy.[81] In fact, the industry's growth was closely linked to state protection.[82] But such mutually dependent connections did not restrict the Republican government from liberally enacting industrial legislation for the benefit of the white workforce.[83] Had miners recognised the urgent need for health legislation, especially dust preventive measures, it is conceivable that the Kruger government would have responded sympathetically.[84]

Such support did not, however, extend to the black workforce. The state consigned its welfare to the equally indifferent mineowners. Belatedly in May 1899, shortly before the outbreak of the Anglo-Boer War, the Randlords considered reforming the health standards in the compounds.[85] But an improvement in the living standards of the Africans was not their primary motive. Rather, it was to prevent the industry being crippled by an invasion of plague in the compounds. This fear was provoked by the outbreak of the disease at Delagoa Bay, the departure point for almost half the black migrant mineworkers.[86] The industry, as we shall later see, always acted promptly and without thought of expense, when outbreaks of infectious diseases threatened the entire white community.

Throughout this pre-war era of rapid industrial growth, the doctors, who were professionally committed to medical care, were passive about its neglect in the industry. The 1894 and 1898 pneumonia epidemics among the Africans on the mines aroused the curiosity of several part-time mine doctors, who performed a number of post mortems to ascertain their causes. But their findings which focussed on isolating the responsible germ, did not at all establish measures for preventing subsequent epidemics with equally serious loss of life.[87] All the same, their associates praised the paper presented at the South African Medical Congress held in Johannesburg in 1898.

Like their overseas colleagues, the Transvaal doctors were narrowly concerned with finding medical cures, more particularly vaccines or therapies for germs.[88] World-wide, doctors did not, at this time, enjoy a high status in the community, and they therefore hoped that this type of research would promote public honour and respect:[89] like that which occurred when Robert Koch discovered the tubercle bacillus in the 1880s.[90] The passionate sentiments of a

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[81] London Mining Journal, 13 April 1895, p. 426.

[82] Harries, P., 'Capital, state and labour on the 19th century Witwatersrand: a reassessment', South African Historical Journal, 18, 1986, p. 31; Jeeves, 'Control of migratory labour' pp. 1, 8; Levy, N., The foundations of the cheap labour system (London, 1982), p. 38; Report of the Council of the Association of Mine Managers, 1895, p. 4.

[83] Katz, E. N., A trade union aristocracy: a history of white workers in the Transvaal and the general strike of 1913 (Johannesburg, 1976), p. 24.

[84] Star, 18 Dec. 1893; PRO. CO. 291/36, individuals, Southport and District Independent Labour Party to Chamberlain, 21 July 1902.

[85] Lang, J., Bullion Johannesburg: men, mines and the challenge of conflict (Johannesburg, 1986), pp. 146-147.

[86] PRO. CO. 291/77, Secretary, TCM, to Lyttelton, 25 March, 1904.

[87] Napier, F. A., 'A series of sixty-three cases of descending optic neuritis probably the result of pneumococcal infection', Transvaal Medical Journal, Jan. 1906, pp. 176-177.

[88] Oliver, Sir T., 'A discussion of miners' phthisis', British Medical Journal, 12 Sept. 1903, p. 572; Rosen, History of miners' diseases, pp. 381-382, 397-399.

[89] Starr, P., The social transformation of American medicine (New York, 1982), pp. 6-7.

[90] Rosen, History of miners' diseases, pp. 272-273; Oliver, Sir T., 'Dust as a cause of occupational disease', in Sir T. Oliver, ed., Dangerous trades: the historical, social and legal aspects of industrial occupations as affecting health, by a number of experts (London, 1902), p. 273.

contemporary research doctor vividly depict the enthusiasm for this kind of research:

> The idea of saving a great country [South Africa] from being sacrificed to an infectious disease [tuberculosis] is a glorious one, and worthy of every effort we can possibly make. Should we fail, no blame can attach on the score of indifference or inaction.[91]

Likewise, the Transvaal medical profession was clearly far more interested in defeating disease quickly through the new and exciting science of bacteriology than through applying long-term hygienic preventive measures, which seemed mundane by comparison. In any event, recommendations involving the application of general hygienic precautions would have brought the Transvaal doctors into conflict with the mineowners. Improved sanitation and ventilation, the 19th century (and early 20th century) corner-stones of good hygiene,[92] would have incurred additional expenses for the industrial controllers at a time when their well publicised goal was to contain mining costs.

The Transvaal medical profession's response to the problem of silicosis among white miners was equally indifferent. Following British precedent, they paid no attention to chronic silicosis which was habitual among miners. A more serious omission, however, was their response to accelerated silicosis. The advent of this new form of the disease occurred on the Rand round about 1898. It afflicted not only middle-aged miners but also the young, aged about thirty.[93] Although doctors recognised that this was a more dangerous and deadly form of the disease, they failed to alert either the mining authorities or the miners to its serious implications. Nor did they issue a single cautionary warning about the well known dangers of dust and its methods of prevention. Instead, they took the least line of resistance: they merely advised their patients to stop working.[94] For most miners such prescription was too late; they died in obscurity either in South Africa or in Britain, if they could afford the passage home.[95] Had it not been for the intervention of the Anglo-Boer War, the neglect of silicosis might well have continued for very much longer.

Medical practice on the Witwatersrand after the Anglo-Boer War

After the war ended, many British doctors emigrated to the Witwatersrand, where they joined their colleagues who had reopened their pre-war practices. But most of those who had hoped 'to make thousands a year' were 'sadly disappointed'. Within a short time there were too many doctors. Because the profession was 'overstocked', doctors on the Rand were forced to depend 'either largely or entirely, on [part-time] appointments, either Government or mine'. The few doctors who obtained government billets, including positions as district surgeons, did 'well'. But most doctors had no option but to rely on part-time jobs on the mines.[96]

As a professional group, South African doctors, as mentioned, had a relatively low economic and social standing. But on the Witwatersrand, where wealth and status tended to coincide, most doctors claimed that their status was actually inferior to that of their colleagues elsewhere in the country.[97] Their reliance on mine appointments, where the mine doctor was 'very much at the mercy of the Manager', further diminished their independence and standing. Mine managers asserted arrogantly that they could 'easily get rid of' doctors who did not toe

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[91] Ramsbottom, A. E., 'The threatened conquest of South Africa by the bacillus tuberculosis', TMJ, 1 Aug. 1905, p. 12.

[92] Anderson, A. M., 'Historical studies of the development of legislation for injurious and dangerous trades in England', in Sir T. Oliver, ed., Dangerous trades: the historical, social and legal aspects of industrial occupations as affecting health, by a number of experts (London, 1902), p. 38.

[93] RMPC, 1902-1903, pp. 24- 26, qq. 131-161 passim, Dr W. G. Rogers; SC 10, 1912, Report of the Select Committee on Miners' Phthisis Bill, 1912, p. viii, appendix C.

[94] SC 10, 1912, pp. 147-148, q. 1116, R. Barry.

[95] GMEAR, 31 December, 1901, p. 1; London Mining Journal, 23 Nov. 1901, p. 1468, letter; The Times, 13 Oct. 1902, letter.

[96] British Medical Journal (BMJ), 3 June 1905, p. 1232; SAMR, 11 Aug. 1917, p. 237; Lancet, 4 June 1904, pp. 1610-1611; Native grievances inquiry, transcript of evidence (Johannesburg reference library), 2 Feb. 1914, p. 60, S. A. M. Fritchard.

[97] Franks, Sir K., 'The position of the medical profession in South Africa', South African Medical Record, 25 Dec. 1909, p. 111; TMJ, May 1908, pp. 249-249, Aug. 1911, p. 15.

the line and 'find plenty of [compliant] doctors to replace them'.[98]

On some mines one part-time doctor attended to both African and white patients, while on others two part-time doctors each had racially distinct practices:[99] the white mineworkers usually elected their own doctor from the mine benefit society panel, but the doctor for the black mineworkers was appointed by the mine manager, who regarded him as 'an unavoidable evil'. Almost every mine doctor was an unsalaried professional who worked for 'so much per head'; and every mine doctor was dependent on the 'patronage', not of the company directors, but of the mine manager.[100]

To safeguard their positions doctors often compromised their medical standards to accommodate the economic needs and wishes of the industry. They accepted positions in which management put no restriction on their case loads, and sanctioned sub-standard nursing of their patients in the mine hospitals. On many mines, for instance, the part-time doctor was responsible for the health of no less than 2000 Africans in addition to the white members of the benefit societies.[101] Not surprisingly, the medical services for both black and white mineworkers were often hopelessly inadequate.

The public insinuation that mine doctors were biassed in favour of their employers did not at all allow for the complexities of their situation.[102] This was understood by a mine inspector who illustrated that some doctors had a genuine conflict of interests:

> 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 [the workmen's 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.[103]

In 1906 there were 181 doctors on the Witwatersrand. Of these 146 practised in Johannesburg and its immediate environs, and the remaining thirty-five either on the far east or the west Rand.[104] Most belonged to the Transvaal Medical Association,[105] and at least thirty on average attended the organisation's monthly meetings, where they took care of professional matters, and presented and discussed problematic medical cases.

It is difficult to establish precisely the average annual income of the Witwatersrand doctors. A senior mine inspector received an annual salary of £1500,[106] whereas senior medical officers of health, also employed by the government, often received less; their annual salaries usually ranged from approximately £800 to £1250.[107] The starting remuneration for an ordinary, full-time state medical post was approximately £450 per annum (25s. per day).[108] For the Witwatersrand, with its high cost of living, this was a very

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[98] Council minutes of the AMM, 16 Jan. 1906.

[99] TAD, Governor of the Transvaal Colony (GOV), 984, 33/11/1906, W. G. Grant to D. Majoribanks, 8 March 1906; Native grievances inquiry, transcript of evidence, 2 Feb. 1914, p. 17, S. A. M. Pritchard.

[100] TMJ, Feb. 1906, p. 207; TAD, Secretary of Native Affairs (SNA), vol. 22, 609/02, W. Wybergh to Dr G. Turner, 21 March 1902.

[101] TAD, SNA, vol. 22, 609/02, W. Wybergh to Dr G. Turner, 21 March 1902; RMPC, 1902-1903, p. 29, qq. 99-100, Dr J. L. Aymard; Native grievances inquiry, transcript of evidence, 2 Feb. 1914, pp. 16-23 passim, S. A. M. Pritchard; Central Archives Depot (CAD), Minister of Mines (MNW), file MM 1106/10, Assistant Secretary of Mines to Deputy Inspector of Mines, Krugersdorp, [April] 1910.

[102] TAD, GOV, 984, 33/11/1906, W. G. Grant to D. Majoribanks, 8 March 1906.

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

[104] TMJ, Jan. 1906, p. 193.

[105] Ibid., Dec. 1909, p. 107.

[106] PRO, CO, 679.1, correspondence, register of despatches and offices, Chamberlain to Milner, 23 Dec. 1901.

[107] SAMR, Oct. 1905, p. 24, April 1906, p. 26; PRO, CO, 291/126, Selborne to Crewe, 1 June 1908.

[108] PRO, CO, 679.1, correspondence, register of despatches and offices, Chamberlain to Milner, 11 July, 1901, 27 Aug. 1901, 23 Dec. 1901; SAMR, Oct. 1905, p. 214, 21 Sept. 1907, p. 70.

low salary. (A married artisan, who had his family with him, could barely subsist on his annual wage of approximately £340).[109] There were therefore few applicants for such positions; doctors could make far more in private practice, even if they had to cut their fees.[110]

The average annual ceiling for the earnings of established doctors could not have exceeded £1500; in 1904, when the Witwatersrand Native Labour Association, the Chamber's recruiting arm, advertised a full-time medical post (with residence) at this salary, there were ninety-four applicants for the job.[111] And in 1905 there was the same fierce competition when the Corner House created eight full-time mine posts (with residence);[112] the four senior doctors, each responsible for a group of two or three mines, received £1800 per annum, whereas the four junior doctors, who had similar responsibilities, received £1000.[113] It can therefore be assumed that the annual earnings of doctors in private practice averaged £1000.[114]

Not only did the doctors attain these earnings through 'time, patience and hard work' in their full-time private practices, but also through stretching their capacities in their part-time posts.[115] By 1914 the entire industry, consisting of sixty-three producing mines, had only ten full-time medical officers (four were employed by the Corner House) who were in charge of eighteen mines. Consequently the remaining forty-five mines were attended by thirty-four part-time doctors.[116] The industry did not establish a standard system for paying part-time doctors, and mine managers used market forces to raise or lower their fees.[117] When times were depressed, doctors actually vied with one another for an annual fee of only £50 (3s. 4d. per day), even though this meant caring for 7000 to 8000 Africans.[118]

The medical profession's responses to the disease death rate, especially from pneumonia, among African mineworkers

It is against this background that we must view the responses of the Witwatersrand medical profession to the post-war health crises in the industry. In May 1901, with great celebration, three mines resumed production.[119] But after this progress was slow. By December one-quarter of the mines that had been producing in 1889 were operative;[120] and it was only in 1905 that the industry managed to reach its pre-war production levels.[121] The main reason for the industry's sluggishness was the shortage of black labour: at the end of 1902 there were 42,000 Africans compared with 97,000 in 1899.[122] Africans withheld their labour for a variety of reasons, the most important being the reduction of their wages by one-third, a decision taken by the Chamber in 1900.[123] Although the Chamber restored wages to their pre-war levels in 1903, it took several years

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[109] Mining industry, 1897, p. 41, S. J. Jennings; TCMA, file W6(c), F. Hellmann to Secretary, TCM, 29 Aug. 1902; West Briton, 6 June 1907; Katz, Trade union aristocracy, pp. 342-43, 345.

[110] TMJ, Jan 1906, p. 170; SAMJ, March 1914, p. 173.

[111] SAMR, Jan 1904, p. 20. See also SAMR, March 1905, p. xi, Sept. 1905, p. xi.

[112] The Corner House abolished these full-time posts in 1906. See SAMR, 10 March 1906, p. 74.

[113] SAMR, 10 Feb. 1905, p. 31, Dec. 1905, p. 254; TMJ, Jan. 1906, p. 170.

[114] See, for instance, SAMR, March 1905, p. xi, Sept. 1905, p. xi, Aug. 1906, p. xi, Dec. 1906, p. xi, 10 April 1908, p. viii.

[115] TMJ, March 1914, p. 173.

[116] UG 37, 1914, Report of the native grievances inquiry, 1913-1914, p. 102, annexures 6 and 7.

[117] Monthly minutes of the AMM, 16 Jan. 1906.

[118] BRA, Rand Mines, minutes of the Geldenhuis Deep, 5 May 1893; Merriman Papers, correspondence, 1912, no. 99; Monthly minutes of the AMM, 16 Jan. 1906.

[119] TCMAR, 1900-1901, p. 41.

[120] PRO, CO, 291/40, despatches, Milner to Chamberlain, 13 July 1901.

[121] GMEAR, 30 June 1905, p. 13.

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

[123] Ibid.

before the Africans' confidence in the mines was restored sufficiently for them to return in their pre-war numbers.[124] In the meantime the mineowners, with the secret connivance of Milner, made arrangements to make good the shortfall of unskilled workers by employing indentured Chinese labourers, who began to arrive in 1904.

Starting in the winter of 1901 and continuing until the end of 1903, the 'abnormally high' mortality among African mineworkers, principally from disease, intensified the unskilled labour shortage.[125] This news, conveyed by newly appointed health officials, disturbed Milner and Sir Godfrey Lagden, Commissioner for Native Affairs.[126] The high disease death rate was a problem in its own right. But as important, it could jeopardise the state-industry plans regarding Chinese labourers. As the Colonial Office made abundantly clear, the British government would refuse to sanction their importation, unless the African death rate was reduced to acceptable levels.[127]

Milner therefore instructed the Native Affairs Department, the government agency responsible for 'controlling' and 'protecting' African mineworkers, to record the specific death rate in the industry for each disease. Further, officials of this department met representatives of the Chamber of Mines to discuss remedial health measures. This meeting, plus later negotiations with the Transvaal Medical Association, resulted in the appointment of a committee of mine doctors to investigate the health conditions of Africans on the mines.[128] The report of the medical committee, adopted in September 1903, offered a number of detailed recommendations for the betterment of compound sanitation, sleeping facilities, diet, and so forth.[129] Although the industry implemented most of the improvements,[130] it took at least a year before they bore any fruits.

In the first half of 1903 the death rate for African mineworkers was 62 per 1000 per annum; and during the second half of 1903 it rose to 80 per 1000 per annum. Diseases accounted for 95 per cent of these deaths. Respiratory diseases were the biggest killers being responsible for 58,34 per cent of the total death rate (inclusive of accidents). Of these, pneumonia (50,83 per cent) and tuberculosis (5,40 per cent) were the most deadly. By comparison, 'all other respiratory diseases', including silicosis, were insignificant (2 per cent).

In the first half of 1904 the disease death rate dropped to 45 per 1000 per annum, but it was still 'three times as high as that in England', and all the more 'appalling' because it applied to 'males in the prime of life'. Milner (and his medical advisers) was unmoved by this comparison. He rejected its suitability on the ground that there was a 'very high' (but unknown) 'kraal' death rate; and submitted that the disease mortality now halved, was proof that African health care on the mines had been successfully reformed.[131] His willingness to accept this new level of mortality (higher than the medical reformers had hoped for) indicated the close ties between the state and the mineowners; both were intent on promoting the material prosperity of the industry.

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[124] TG 2, 1908, p. 208, statement of J. B. Roberts. See also Denoon, D. J. N., 'The Transvaal Labour Crisis, 1901-6', Journal of African History, VIII (3), 1967, pp. 481-494 passim.

[125] PRO, CO, 291/57, despatches, Milner to Chamberlain, 23 May 1903.

[126] PRO, CO, 291/57, despatches, Milner to Chamberlain, 23 May 1903, enclosure no. 2; TAD, SNA, vol. 22, 609/02, Dr G. Turner to Lagden, 8 April 1902, W. Wybergh to Dr G. Turner, 21 March 1902, 656/02, Dr G. Turner to Lagden, 19 April 1902, Lagden to Dr G. Turner, 19 April 1902.

[127] Cd. 2183, 1904, Further correspondence relating to labour in the Transvaal mines, p. 41, Lyttelton to Milner, telegram, 22 Feb. 1904; Cd. 2025, 1904, Correspondence relating to conditions of native labour employed in Transvaal mines, p. 42, Milner to Lyttelton, telegram, 27 Feb. 1904; PRO, CO, 291/68, despatches, Milner to Lyttelton, 27 Feb. 1904.

[128] PRO, CO, 291/69, despatches, Milner to Lyttelton, 21 March 1904, 2 April 1904, memorandum; TDMA, file NB, A. Lawley to President, TCM, 17 May 1904; Cd. 2183, 1904, pp. 144-145, annexure J.

[129] Report to the Commissioner for Native Affairs on the mortality amongst natives on the mines of the Witwatersrand, 1903, passim. Unless otherwise stated, the information which follows is based on this source.

[130] Irvine and Macaulay, 'Life history', p. 357.

[131] PRO, CO, 291/57, despatches, Milner to Chamberlain, 23 May 1903, enclosure no. 2, 291/72, despatches, Milner to Lyttelton, 12 Sept. 1904, enclosure, Dr C. L. Sansom to the Pass Commissioner, Native Affairs Department, 27 Aug. 1904, 291/133, parliament, minute, 18 Nov. 1908.

As in Kruger's time, so, too, during the reconstruction era, the state and the industry were in many respects mutually dependent on one another. Yet from the reconstruction period until responsible government in 1907, the Randlords certainly exerted far more direct and indirect political influence than they had done under the republican government. Their direct influence was especially noticeable. For example, three leading mining house directors, who at various times were presidents of the Chamber, were also influential politicians.[132] Less obvious, though equally important, was the industry's indirect influence on government through the Department of Native Affairs and the Department of Mines; many officials at all levels in the hierarchy of both department had been employed by the industry before the Anglo-Boer War.[133] Because of their former managerial experience with the mining houses the senior personnel of both departments favoured the industry at the expense of mineworkers and actively promoted the industry's attempts to reduce working costs.

This priority was particularly evident among officials of the Department of Mines, who complied with the many wishes of the Association of Mine Managers. Mine inspectors 'liberally construed' the regulations to meet the 'present circumstances'.[134] They were reluctant, for example, to prosecute management; in line with their policy of gentle persuasion they merely issued warnings instead of levying fines.[135] Inspectorate warnings had very little impact on management, who continued to infringe the regulations with impunity.[136] Such contempt for state controls extended to health regulations with adverse consequences for mineworkers. Yet the Witwatersrand doctors did not protest. By this omission the Transvaal medical profession condoned the actions of management and the state, and was in effect, party to their transgressions.

The improvements recommended by the committee of mine doctors, many of which were enacted as government regulations in 1906, were a source of pride to the medical profession.[137] Yet in 1914 the visiting American consultant, Surgeon-General W. C. Gorgas, reported that, notwithstanding the medical reforms, the new health standards were still extremely poor.[138] Gorgas's criticisms and suggestions were not made from the vantage of advances in medical science, and they were not theoretical and merely academic. Nor was his approach strictly curative. Instead, it was based largely on preventive principles which he had successfully applied among the large and predominantly black workforce responsible for building the Panama Canal. His conquest of disease won him world-wide acclaim, for between 1906 and 1912 he reduced the disease mortality rate on the Isthmus of Panama from 45 to 7 per 1000 per annum. During this process there was also a 'sudden and permanent drop in the death rate from pneumonia': it fell from 18.4 to 2 per 1000 per annum.[139] Gorgas's criticisms of the Witwatersrand targeted the Africans' living conditions in the compounds and the quality of the care they received in the mine hospitals, both of which areas had ostensibly been reformed in 1903 and 1905. The truth was, as Gorgas's sanitary innovations at Panama showed, that the improvements were grossly inadequate by comparison with what was actually required and with what could feasibly be achieved.

On the Witwatersrand, although the improved diet helped reduce the incidence of scurvy, it was monotonous and high in starch and deficient in vitamins, protein

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[132] They were Sir Percy FitzPatrick, Drummond Chaplin and Sir George Farrar. See Grey, P. C., 'The development of the gold mining industry on the Witwatersrand 1902-1910', (D. Lit. thesis, University of South Africa, Pretoria, 1969), p. 64.

[133] Jeeves, A., Migrant labour in South Africa's mining economy: the struggle for the gold mines' labour supply 1890-1920 (Johannesburg, 1985), pp. 48-49; PRO, CO, 291/37, despatches, Milner to Chamberlain, 23 Dec. 1901, Milner to Chamberlain, 17 Jan. 1903, 291/38, despatches, Milner to Chamberlain, 8 March 1902, enclosure, 291/39, despatches, Milner to Chamberlain, 21 June 1902, enclosure 291/50, individuals, E. P. Rathbone to Chamberlain, 13 March 1902.

[134] Council minutes of the AMM, 20 April 1903.

[135] PRO, CO, 291/73, despatches, Milner to Lyttelton, 10 Oct. 1904, enclosure, 3 Sept. 1903; Council minutes of the AMM, 2 March 1903.

[136] TAD, MM, 1395/06, 22 May 1906.

[137] Irvine and Macaulay, 'Life history', passim.

[138] TCMA, files N8 and N9 passim; Report of the Coloured Labour Compound Commission, 1905, pp. 1-93; PRO, CO, 291/80, despatches, Milner to Lyttelton, 6 Feb. 1905, minute; Gorgas, W. C., Recommendations as to sanitation concerning employees of the mines on the Rand made to the Transvaal Chamber of Mines (Johannesburg, 1914), pp. 9-11.

[139] Gorgas, passim; Lancet, 28 March 1914, pp. 913-914, 2 May 1914, pp. 1281-1282.

and fat: it was a maize (mealie meal) diet, usually served in the form of porridge, and was varied only once or twice a week by small rations of meat and vegetables, often of inferior quality. As a local German doctor (not part of the British establishment) put it: '[The diet] was as insufficient as it was unscientific.'[140] The sleeping quarters, though better constructed than before, continued to be dirty and over-crowded, and were poorly ventilated and bitterly cold.[141]

The mine hospital, often nothing more than an isolated room (or more euphemistically, an 'enclosure'), frequently sheltered indisposed mineworkers on 'sleeping boards (not beds)' with 'wooden pillows'. All the disabled were hospitalised together, no attempt being made to isolate patients with highly infectious conditions from those suffering from traumatic disabilities, such as minor abrasions.[142] They were attended to in the main by unqualified orderlies: 'a staff of ignorant boys';[143] and convalescents were forced to perform 'light [physical] work' without pay.[144] Such conditions were not at all conducive to recovery, as doctors were fully aware.[145] Pneumonia, for instance, required intensive nursing and even 'three months convalescence' without any work whatsoever.[146]

Rather than face confinement in the hospitals, which they detested, indisposed Africans tended to work until they 'collapsed', or they left the mines voluntarily ('deserted') and returned home. This was not simply because they had a primitive and superstitious fear of hospitals per se, as doctors claimed.[147] Instead, they were terrified of dying in isolation under circumstances that were, to say the least, spartan and uncaring. On many mines, management was reluctant to nurse the seriously ill. Rather than have their deaths reflected in the industry's records, management expeditiously 'shunted' the sick and dying Africans home on trains so that their rural dependents and communities could care for or bury them.[148]

All these medical reforms had one thing in common: they were piecemeal, sub-standard and saved the mineowners money. They were devised by a group of medical professionals who were singularly conscious of the industry's 'present circumstances'; after the initial, but temporary, post-war boom, the industry was now in a slump (it lasted from 1903 to 1909) and needed to economise more than ever before. The propensity of the medical profession to help the industry was reinforced by yet another aspect of the mineowners' propaganda: they managed to convince the doctors that the community's material welfare depended not only on the successful performance of the industry as a whole, but that it also hinged on the profitability of the poorest and weakest low-grade producers.[149] The cost of health services to the poorer mines, and not to the industry as a whole, therefore also greatly influenced the actions and decisions of the Witwatersrand medical profession. The 1904 controversy regarding the compounds, which took nearly a year to resolve, clearly illustrates this point.

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[140] Klein, M. M., 'The general principles governing the proper dieting of human beings and their application to the subject of the feeding of native labourers in mine compounds', South African Medical Record, Feb. 1905, p. 32.

[141] For details, see Baker, 'Silent crisis' pp. 156-186 passim.

[142] Evening Chronicle, 20 June 1913, letter; Report of the Transvaal coloured labour compound commission, 1905, p. 38, Dr L. G. Irvine and Dr D. Macaulay; TMJ, Aug. 1911, p. 15; Native grievances inquiry, transcript of evidence, 2 Feb. 1914, pp. 17 ff., S. A. M. Pritchard.

[143] TMJ, Aug. 1011, p. 15.

[144] Native grievances inquiry, transcript of evidence, 2 Feb. 1914, pp. 22-23, S. A. M. Pritchard.

[145] See, for instance, Evening Chronicle, 20 June, 1913.

[146] See, for instance, Napier, 'Series', p. 31.

[147] Evening Chronicle, 28 June 1913; UG 37, 1914, Report of the native grievances inquiry, 1913-1914, pp. 51-52, pars. 392-393; Native grievances inquiry, transcript of evidence, 2 Feb. 1914, pp. 22-23, S. A. M. Pritchard; SC 2, 1913, Report of the Select Committee on native affairs, 1913, pp. 142-145 passim, Dr S. V. van Niekerk.

[148] TMJ, Aug. 1911, p. 15; Union House of Assembly Debates, H. Mentz, 13 May 1913, cols. 2372-2373, J. X. Merriman, 13 May 1913, col. 2378; Union Senate Debates, G. G. Munnick, 19 March 1912, cols. 130-131; SC 2, 1913, p. 128, q. 1269, Dr A. J. Gregory; SC 4, 1914, Report of the Select Committee on working of Miners' Phthisis Act, 1912, p. 361, qq. 2000-2001, S. A. M. Pritchard.

[149] Jeeves, 'Control of migratory labour', pp. 6-7.

When George Turner, Transvaal Medical Officer of Health, prescribed that the minimum ventilation standard in the Chinese (and African) compounds should be 300 cubic feet of air space per person, the Chamber objected on the ground of costs. In arguing in favour of 200 cubic feet per person - a minimum advocated by the committee of mine doctors - the Chamber showed that the difference in capital costs between the two standards was as much as £5 per person. Such 'practical reasons' subsequently influenced two medical investigations which sanctioned the Chamber's demand: first, an informal enquiry by a sub-committee of the Transvaal Medical Association; and second, a formal government commission, consisting predominantly of medical doctors. The 'practical reasons' to which the medical profession pandered, suited the budgets of the poorer mines and saved the industry £2,250,000. Although the weight of Witwatersrand medical opinion was against Turner, he clung tenaciously to his unpopular requirement, based on British ventilation practices; his integrity, although vilified by the Chamber and his colleagues as 'ignorance', was vindicated, but only in 1914, when Gorgas's report highlighted the inadequacies of the compound ventilation.[150]

The Witwatersrand doctors clearly modified medical standards to accommodate the industry regarding the ventilation controversy. The medical profession took seriously the implied threat of Harold Strange, President of the Chamber in 1904, who warned that the enforcement of Turner's ventilation standard 'would greatly affect the prosperity of the country', as many poor mines would not be able to bear the cost of Chinese labourers.[151] This was echoed by the Transvaal Medical Journal. In an editorial it congratulated the commission on its 'just' findings which favoured a 'more economical housing than that suggested by Dr. Turner'. At the same time it reminded its readers that the 'interests' of the Witwatersrand medical profession, like a 'certain section' of the press, 'were intimately woven with Transvaal prosperity in its widest sense'.[152]

The medical profession was equally accommodating to the industry in matters concerning underground health standards. Although such partiality seriously affected the well-being of both black and white mineworkers, its consequences were tragic for miners who, as we have seen, were extremely vulnerable to silicosis.

The medical profession's responses to the mortality among miners from silicosis

As soon as the mines began producing in May 1901, mine managers discovered that many of the finest pioneer rock drillers had either died abroad or at South African coastal towns, where they had retreated when the war started. As an informal Mines Department enquiry later showed, in the eighteen-month period (from October 1899 to March 1901) 227 of the 1477 pre-war rock drillers (16,5 per cent) had died as a result of intense dust exposure at an average age of thirty-five years.[153] These findings were confirmed, but only two years later, when the investigative commission on silicosis, the Weldon Commission, presented its report.[154] Its appointment had been delayed - even resisted - because neither Milner nor the Randlords wanted unfavourable publicity at this critical juncture in the industry's history.[155]

Despite the huge prevalence of the disease among rock drillers as well as general miners, and although the disablement and death or rock drillers occurred on average after only seven years' work with the machines,[156] yet another two years elapsed before the government enacted specific regulations to prevent

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[150] TCMA, files N8 and N9 passim; Report of the coloured labour compound commission, 1905, pp. 1-93; PRO, CO, 291/80, despatches, Milner to Lyttelton, 6 Feb. 1905, minute; Gorgas, Recommendations, pp. 9-11.

[151] TCMA, file N9, 'Notes of a meeting held in Pretoria', 8 July 1904.

[152] TMJ, 1 Oct. 1905, pp. 61-62.

[153] GMEAR, 31 Dec. 1901, pp. 10-11; GMEAR, 30 June 1902, p. 8; Council minutes of the AMM, 5 Aug. 1901; Monthly minutes of the AMM, 19 Aug. 1901.

[154] RMPC, 1902-1903, passim.

[155] See, for instance, PRO, CO, 291/43, despatches, Milner to Chamberlain, 27 Oct. 1902; Star, 4 Oct., 16 Dec. 1902; and BRA, HE, vol. 258, file 154M, F. Oats to C. E. Rube, 11 July 1902: S. J. Jennings to H. Eckstein and Company, 21 Aug. 1902.

[156] For epidemiological data, see RMPC, 1902-1903, pp. vi-ix, pars. 5-10; Cd. 2091, 1904, pp. 8, 17, 18, tables, 16 and 17.

dust.[157] Such dilatoriness took no account of the medical profession's warning to the Weldon Commission that silicosis on the Witwatersrand was 'more fatal...than in most other mining centres'.[158]

The anti-dust regulation promulgated in December 1905 were similar to those enacted in Britain a year earlier, and provided for the compulsory use of water during machine drilling and after blasting. Unlike the British ones, however, they made no provision for the protection of general miners, as opposed to rock drillers; they did not make the use of water compulsory in ore-removal jobs and in all production tasks, including hammer drilling. To its credit the Transvaal Medical Association formally protested these omissions to the government, but to no avail.[159]

Unlike the English measures, which were reasonably well implemented,[160] the ones on the Rand were a dead letter: the mineowners ignored the regulations, and the state, which did not enforce them, actually withdrew them after only a few months.[161] The truth was that the cheap water devices, supplied by management, were completely ineffective.[162] The resistance of miners to using them was understandable; the compulsory portable atomisers, which did not allay the dust, created so much fog that they laid the miners open to contracting pneumonia.[163] Yet when both controlling parties failed to achieve any tangible results, they blamed the workmen for their failure to comply with the dust controls.[164]

If the mineowners were not prepared to spend trifling sums for improving hygiene (providing underground sanitation and building change houses), as the Weldon Commission recommended, they were even less willing to bear the moderate costs that the provision of water-pipes and fresh water entailed.[165] It is therefore scarcely surprising that in 1910, when the Mining Regulations Commission (appointed in 1907) presented its final report, the mortality from silicosis had not declined since 1903.[166] In fact, both the incidence and prevalence of the disease were on the increase.[167]

In 1910 the official silicosis death rate was 11 per 1000 per annum amongst white underground workers 'at ages of twenty and over'.[168] These figures (calculated in 1907, but not updated in 1910) do not at all convey the overwhelming predominance of the disease among a discrete group which constituted only half the underground white workforce. Nor do they indicate that 'at least one-third and probably a greater proportion of the disabled Rand miners left the country

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[157] PRO, CO, 291/72, despatches, Milner to Lyttelton, 15 Aug. 1904; CAD, MNW, file MM 2288/10, R. N. Kotze to H. W. Smythe, 29 Aug. 1910, enclosure: Transvaal Government Gazette, no. 1100, 22 Dec. 1905.

[158] JCMS, Aug. 1903, p. 30, Dr L. G. Irvine.

[159] TMJ, Jan. 1906, p. 192, Feb. 1906, pp. 209-214.

[160] London Mining Journal, 17 Feb. 1912, p. 159; FRMRC, 1910, vol. 2, p. 31, T. Mathews and M. Trewick; Cd. 7476, Second report of the Royal commission on metalliferous mines and quarries, 1914, pp. 49, 130, 148-149, table 2, 151-152; Macaulay and Irvine, 'Safety measures', pp. 297-298; JCMS, Sept. 1906, p. 81, E. M. Weston.

[161] CAD, MNW, file MM 2288/10, H. W. Smythe to R. N. Kotze, 23 Aug. 1910, enclosure: TMJ, Feb. 1906, p. 209; TG 2, 1908, pp. 360, 374, qq. 3603, 3841, R. B. Greer and T. Willis.

[162] Star, 17 Oct. 1902; JCMS, Sept. 1906, p. 82, W. R. D. Macqueen.

[163] TAD, MM, 1395/06, 22 May 1906.

[164] See, for instance, Merriman Papers, J. de Villiers to J. X. Merriman, 30 May 1907; Transvaal Legislative Assembly Debates, J. de Villiers, 26 April 1910, cols. 635-636; and BRA, HE, vol. 244, file 107H, S. Jennings to H. Eckstein and Company, 9 Oct. 1906, vol. 286, file 240V, memorandum by G. E. Webber, 2 July 1906.

[165] FRMRC, 1910, vol. 1, pp. 281-282; vol. 2, p. 30, T. Mathews and M. Trewick; CAD, MNW, file MM, 2208/10, R. N. Kotze to H. W. Smythe, 29 Aug. 1910, enclosure; JCMS, Sept. 1906, p. 81, E. M. Weston.

[166] FRMRC, 1910, vol. 1, p. 241.

[167] Transvaal Leader, 28 Aug. 1909.

[168] Oliver, Diseases of occupatio, p. 285; FRMRC, 1910, vol. 1, p. 37, pars. (2), (3), vol. 2, pp. 140-141, Dr L. G. Irvine.

and died' invisibly at their homes abroad.[169] If these factors are taken into account, the mortality of rock drillers was probably as high as 120 per 1000 per annum and that of general miners (including rock drillers) 60 per 1000 per annum.[170]

Throughout this sorry period, the Witwatersrand medical profession did very little to warrant congratulation. Up to the appointment of the Weldon Commission in November 1902, the medical profession did not disclose the magnitude of the problem to the press or even to their colleagues through the medium of any one of the many medical journals, either local or overseas. Nor did the doctors produce a single letter or article either as individuals or as a professional group urging a commission.[171] Yet during the period individual doctors consulted with as many as 150 patients who had contracted the new, accelerated form of the disease.[172] The doctors, like the press, succumbed to the fog of silence that enveloped the Reef.

At the request of the miner's union in August 1902, a six-man committee from the Transvaal Medical Association investigated the disease for two months, but then did nothing with its report. The doctors failed to submit it to the government, as they had promised the Transvaal Miners' Association to do. Nor did they publish it. Though their conclusions criticised the industry's mining methods only by implication, the doctors lacked the courage to circulate their findings - perhaps fearing a hostile reception. Put bluntly, in the absence of any form of objective and 'open discussion' on the Rand, the doctors were too scared to handle a 'notorious' problem independently. They were prepared to present their report only to the Weldon Commission, because this provided official sanction.[173]

Such inertia contrasted sharply with the assertiveness of doctors in Britain to the same problem, which they confronted when Witwatersrand miners returned home during the war. Led by Sir Thomas Oliver, the renowned occupational health specialist who practised in north England, a number of British doctors made a concerted effort to rally the public press and medical and mining journals as soon as peace was declared (in May 1902).[174] They wanted the appointment of a Transvaal commission and the speedy institution of dust preventives on the gold mines, even if the self-same remedies had to be applied to the tin mines in Cornwall. Their petitions to the Colonial Secretary plus their organisation of a Cornish parliamentary lobby forced Milner to capitulate and to appoint the Weldon Commission.[175] Their efforts did not stop at this point. Unlike their Witwatersrand colleagues, the small band of health reformers in Britain continued to agitate until anti-dust measures were eventually enacted in the Transvaal.[176]

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[169] FRMC, 1910, vol. 2, pp. 234, 241, Dr. L. G. Irvine.

[170] These are my calculations derived from the sources below. They correspond with the calculations of E. J. Moynihan, a contemporary consulting mining engineer and critic of the mining houses, who used a different data base. FRMC, 1910, vol. 2, pp. 234, 241 (n), L. G. Irvine; Cd. 7476, 1914, p. 148, table A; Transvaal Leader, 29 Aug. 1910; Fraser D. S. and Irvine, L. G., 'Statistical account of the incidence and progression of silicosis amongst the gold miners of the Witwatersrand', in International Labour Organisation (ed.), International silicosis conference, Johannesburg, 1930 (Geneva, 1930), conference paper, no. 17, p. 6; UG 19, 1912, Report of a commission...to enquire into the prevalence of miners' phthisis and pulmonary tuberculosis on mines within the Union of South Africa, p. 21, par. 21; Lancet, 2 Dec. 1911, p. 1587, letter.

[171] Only one Witwatersrand doctor committed himself in the press, but his primary motive was to advertise a respirator he had patented. See Star, 12 Nov. 1902.

[172] RMPC, 1902-1903, pp. 13, 26, qq. 9, 170, Dr W. D. Frazer and Dr L. G. Irvine.

[173] For details of the report and the events that preceded its compilation, see RMPC, 1902-1903, pp. 1-11, Dr F. Napier.

[174] Oliver, 'Gold Miner's [sic] Phthisis', pp. 1677-1679; PRO, CO, 6 Sept. 1902, 291/46, parliament, minutes, 28 Oct. 1902, 291/51, 291/52, individuals, N. Trestrail and Dr J. Brown to Chamberlain, 1, 29 Aug. 1902; Cornubian, 21 Oct. 1902, 20 March 1903. See also London Mining Journal, 21 June 1902, p. 873, 5 July 1902, p. 935, 12 July 1902, p. 967, 19 July 1902, p. 996; and The Times, 13 Oct. 1902.

[175] Cornubian, 21 Oct. 1902, 20 March 1903; House of Commons Debates, W. S. Caine, 21 Oct. 1902, cols. 352-353, 29 Oct. 1902, col. 1070; PRO, CO, 291/46, parliament, minutes.

[176] London Mining Journal, 28 Oct. 1905, p. 470; PRO, CO, 291/172, despatches, Lyttelton to Milner, 15 Aug. 1904, enclosure, R. B. Haldane to Elgin, 6 Jan. 1906.

The Witwatersrand doctors certainly were capable of concerted action, as their reaction to the 'Lungsava' episode showed. The most popular quack medicine among silicotic miners was 'Lungsava', a concoction including alcohol and an indigenous plant root used by the Africans as an emetic.[177] Although the doctors acknowledged that the treatment they prescribed for silicotics was futile, they nevertheless ridiculed miners for resorting to old wives' remedies.[178] They were therefore outraged when they discovered that 'Lungsava' was being manufactured by a bogus doctor, and in 1906 and 1908 the Transvaal Medical Council pressed charges against him for unlawfully practising as a doctor.[179] Yet their motive for acting forcefully was not to protect the health of the gullible miners, but rather to safeguard their professional standing.

Had the miners been dying of an infectious disease which placed the entire community, especially whites, at risk, Milner and his officials would undoubtedly have responded with a sense of urgency. This happened in 1904 when bubonic plague broke out among the Fordsburg Indian community. Milner, who wasted no time and spared no cost on that occasion, went to great lengths, even circumventing regulations, to halt the epidemic and to prevent its recurrence.[180] The state responded similarly in 1905 and 1906, when small-pox epidemics threatened the white community.[181] The Witwatersrand doctors, who strongly supported the state in all these instances, were unequivocally prepared to combat infectious diseases - all sectors of the community, including those with wealth and power, were vulnerable to germs! Both Milner and the medical profession regarded silicosis in a different light: it was a working-class disease and non-contagious. In their view it warranted no attention and certainly no advertisement.

These attitudes persisted and coincided with important changes in the industry's production process. In 1905, when the industry had at last acquired an adequate supply of unskilled African and Chinese labourers, the mineowners intensified production. Before the Anglo-Boer War the mineowners had tended to mine selectively; they chose richer ores, and overlooked poorer reserves.[182] But they now altered their policy and mined according to the average; all the reserves were mined, even though some of the poorer ones ran as low as 4 dwts. per ton.[183] This was a risky policy because profitability hinged on the attainment of yet more cost reductions and the further acceleration of production.

In pursuit of these goals - additional tonnage at reduced costs - mine managers encouraged miners to speed up, going so far as to 'clap their hands' when miners flouted the regulations to exceed daily targets.[184] Speeding up also caused dust levels to increase dramatically, but without any ventilation controls. This was because the ventilation regulations, suspended in 1903, were still under discussion pending their reform, as recommended by the Weldon Commission.[185] Sound ventilation, an effective preventive for many infections, and the finest weapon against silicosis, was the most expensive health reform and therefore the last to receive any attention on the Rand.[186]

The other cornerstone of hygiene, underground sanitation, was equally neglected by the mineowners and again for reasons of cost. This was so, notwithstanding legislation for its provision in 1902, and the Weldon Commissions's

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[177] TG 2, 1908, p. 691, q. 8878, F. Crean.

[178] Oliver, 'Gold Miner's [sic] Phthisis' p. 1679; van Niekerk, 'Miners' phthisis', p. 270; Nightingale, P. A., 'Scurvy and beri-beri: an etiological comparison and deduction', Transvaal Medical Journal, April 1911, p. 193.

[179] Rand Daily Mail, 8, 12 Jan. 1908; TMJ, Aug. 1906, p. 14; SAMR, 25 Jan. 1908, p. 30.

[180] Cd. 2104, 1904, Correspondence relating to affairs in the Transvaal and Orange River Colony, pp. 84-87; Rand plague committee: report upon the outbreak of plague on the Witwatersrand March 18th to July 31st, 1904, 1905 passim; PRO, CO, 291/69, despatches, Milner to Lyttelton, 20 March 1904, telegram no. 1

[181] SAMR, Sept. 1905, pp. 191, 195, Oct. 1905, p. 212; TMJ, Feb. 1907, pp. 170-171.

[182] Bleloch, W., The new South Africa: its value and development (London, 1901), p. 34.

[183] Taylor, African treasures, p. 125.

[184] TAD, MM, 1395/06, 22 May 1906.

[185] JCMS, July 1905, p. 7; TAD, MM, 1395/06, 22 May 1906, and 'Ventilation of Mines: Precis'.

[186] Marriott, Money & mines, pp. 58-65 passim.

recommendations for its betterment in 1903. Despite the introduction of underground latrines, there were too few of them, and their condition was 'as disgusting, as they were disgraceful and dangerous'.[187] African and white mineworkers refused to use them; they preferred the dark corners, which emitted less of a stink and provided more privacy.[188] Health officials blamed them for doing so, and held them responsible for spreading and contracting diseases such as dysentery and enteric fever.[189] Such accusations were unfair; the spread of infection was as much caused by the cheeseparing policies of the Randlords as by the workers' rejection of offensive facilities. The mineowners' refusal to provide fresh water underground was another case in point. In the absence of fresh supplies, mineworkers were forced to tap water from holes in the ground or from the sumps to allay the dust and even for drinking purposes. As the sumps were fed by the drains, the water was usually contaminated with 'droppings' and 'urine'.[190] The spread of infection was further stimulated by 'dejecta containing tubercle bacilli'.[191]

The acid disinfectant water on the Witwatersrand usually killed the larvae of the hookworm responsible for the intestinal disease, ankylostomiasis. Yet in 1906 these natural impediments could not stop a major outbreak of the disease, which occurred on an unidentified deep level mine. Although the Chamber of Mines ensured that the 'official enquiry' was 'hushed up', this epidemic (and there were probably several others) was indicative of the severe underground pollution.[192]

The condition of change houses was generally improved after the war. But some were distinctly shoddy, such as the 'sheds' of the Robinson group, which were still being used as change houses well after 1910. Health officers contended that miners, who avoided the change houses, were 'careless' and 'ignorant', and were therefore themselves responsible for contracting infections. This criticism was unwarranted. Most miners considered the change houses beneficial and only shunned them when they were deficient.[193]

Following the Weldon Commission's recommendation, mine doctors suggested that the industry build simple warmed change houses for Africans at the headgears. But the colonial Mines Department, like its republican predecessor, failed to make this compulsory. A few mining houses voluntarily provided shelters for Africans in lieu of change houses, but this procedure was exceptional.[194] Health officials did not seem to realise that Africans, like their white counterparts, deliberately avoided the change houses because of their spartan and distasteful conditions.

In 1906 a regulation was enacted stipulating that change houses be routinely built for Africans. But the Chamber of Mines opposed the provision on the ground of expense. In 1907, however, on the advice of the mine doctors, the Randlords agreed to provide shelters or waiting-rooms, which would be warmed during winter. They would not be built everywhere, but only at those shaftheads situated at some distance from the compounds. The shelters were intended to reduce the tropical Africans' 'exposure to wet and bleak weather', and to prevent them from contracting pneumonia. But as many mineowners obtained exemptions from providing

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[187] Praagh, Transvaal, p. 526.

[188] FRMRC, 1910, vol. 1, pp. 88-89; TG 2, 1908, p. 376, qq. 3869-3870, T. Willis.

[189] See, for instance, PRO, CO. 291/57, despatches, Milner to Chamberlain, 23 May 1903, undated enclosure no. 2, 'Memorandum by the District Medical Officer for Health', Dr C. L. Sansom; JCMG, Oct. 1906, p. 112, C. B. Saner; and Macaulay and Irvine, 'Safety measures', p. 300.

[190] FRMRC, 1910, vol. 2, p. 18, T. Mathews and M. Trewick.

[191] SC 10, 1915, Third and final report of the Select Committee on working of Miners' Phthisis Acts, p. xxx, par. 50.

[192] BMJ, 28 May 1904, p. 1272; FRMRC, 1910, vol. 1, p. 52; van Niekerk, 'Miners' phthisis', p. 30; TMJ, May 1906, pp. 309-310; Transvaal Leader, 17 Aug. 1910; Cd. 7478, 1914, p. 151, q. 2023, H. F. Marriott.

[193] Transvaal Leader, 11 Aug. 1910; TG 3, 1910, Annual report of the Government Mining Engineer, 30 June 1909, p. 40; UG 40, 1913, Mines Department. Annual report, 31 December 1912, p. 148; TAD, MM, 139/06, 22 May 1906; FRMRC, 1910, vol. 2, p. 31, T. Mathews and M. Trewick.

[194] FRMRC, 1910, vol. 1, p. 70; Irvine and Macaulay, 'Safety measures', p. 365; Council minutes of the AMM, 4 June 1906.

shelters, even this watered-down provision proved to be a dead letter.[195]

Had change houses been built, the tropical Africans' capacity to adapt to different temperature levels might have been improved. But exposure to fluctuating temperature and humidity changes was only one factor in the cause of pneumonia epidemics. Any significant improvement in the prevention and treatment of pneumonia required radical changes in both the social and medical services for African mineworkers. But the doctors did not recommend radical changes (and the mineowners did not implement them voluntarily), because of the large capital costs involved.

As with pneumonia, the industry's half-hearted and piecemeal attempts to prevent silicosis failed to reduce the incidence of the disease in any way up to 1910. Such a reduction called for medical and hygienic precautions to be implemented at the same time as dust prevention measures.

Credit must be given to two doctors who showed the medical profession what could be achieved through speaking openly with courage and integrity. In 1906 Donald Macaulay and Louis G. Irvine presented a paper entitled 'Safety Measures in Mining' to the Chemical, Metallurgical and Mining Society of South Africa. The second part of the paper, which was devoted to the prevention of silicosis, provoked much positive and open discussion, but only among the organisations' members.[196] This persuaded the doctors to seek a wider audience, and they presented their findings the following year as evidence to the Mining Regulations Commission, appointed to investigate, inter alia, the health grievances of the miners who had gone on strike early in 1907. Although the miners had many grievances, the catalyst for the strike was the high silicosis mortality among them.[197]

The doctors' findings concerning the high death rate among rock drillers in particular strongly influenced the commissioners and prompted them to take an unusual step. In November 1908, long before they had completed their report and two years before its publication (in August 1910), the commissioners sent an urgent directive to Jacob de Villiers, Minister of Mines, in which they pressed him to enact immediate and more comprehensive anti-dust measures. Included in their recommendations was a draft regulation that gave detailed instructions for installing water pipes.[198]

Although this recommendation was acted upon immediately, the new government of Botha and Smuts was as disinclined to enforce health measures as the previous colonial government had been. Although the responsible government cabinet was fully apprised of the mortality from silicosis, De Villiers went so far as to claim that the miners' complaints regarding ventilation deficiencies were groundless, and that the silicosis among them was self-inflicted and due to their negligence.[199] Without government support for reform the Transvaal medical profession relapsed into lethargy after its brief flurry of activity. Even those doctors who had helped make piecemeal improvements possible, continued to be paternalistic and, more perniciously, carried on blaming the victims: the regulations, they stated, were necessary to protect the 'ignorant' miners from the risks involved in their work.[200]

No provision was made for the hospitalisation and care of disabled silicotics who endured agony until they died. The Johannesburg Hospital, with its 275 beds for white patients, had no facilities for nursing patients with chronic illness and refused to admit sufferers of infectious disease, including tuberculosis, unless they were 'more or less in extremis'.[201] The only option for silicotics was admission to the Rietfontein Hospital, a government institution consisting of a

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[195] TDMAR, 1907, pp. 17, 85; FRMRC, 1910, vol. 2, p. 256, Dr L. G. Irvine: Native grievances inquiry, transcript of evidence, 2 Feb. 1914, p. 24, S. A. M. Fritchard.

[196] Macaulay and Irvine, 'Safety measures', pp. 292-304 passim.

[197] Katz, E. N., 'The White Death': silicosis (miners' phthisis) on the Witwatersrand gold mines, 1886-1919 (Wits University Press, Johannesburg, 1994, forthcoming), passim.

[198] FRMRC, vol. 1, pp. 281-282; CAD, MNW, file MM, 2208/10, R. N. Katze to H. W. Smythe, 29 Aug. 1910, enclosure.

[199] Merriman Papers, J. de Villiers to J. X. Merriman, 30 May 1907; Transvaal Legislative Assembly Debates, J. de Villiers, 26 April 1910, cols. 635-636.

[200] FRMRC, 1910, vol. 2, p. 240, Dr L. G. Irvine.

[201] South African Mines, Commerce and Industries, 24 Nov. 1906, p. 251; Praagh, Transvaal, pp. 271-272; SAMR, 10 Feb. 1906.

lazaretto (the depot for plague and syphilis, as well as other infectious cases), and a chronic sick home (the depot for 'incurable diseases'). Established in 1903 to relieve the congestion in the Johannesburg Hospital and situated seven miles east of Johannesburg (a day's walk from the town), the Rietfontein hospital consisted of 'a collection of wood and iron shanties located anyhow on the veldt'. Silicotics boycotted it not only because its conditions were deplorable - as even the medical profession acknowledged - but also because they resented being classed together with the other inmates as 'undesirables'.[202]

The initiatives for supporting destitute silicosis sufferers stemmed not from the medical profession, but from the Association of Mine Managers. In 1908 it successfully petitioned the Chamber to erect a sanatorium on land provided by the Botha-Smuts government. But the lavish nursing home, Springkell, which resulted, proved to be a white elephant. The miners shunned it because of its remoteness (twelve miles from the town) and because they had a horror of dying in isolation. This horror was all the more immediate because their major recreation was 'seeing a funeral twice a week.'[203]

Similar palliatives were not provided for Africans suffering from silicosis. They simply died on the mines or returned home to do so. The vulnerability of long-service Africans to the disease was not in question. It was accepted that these Africans, who were few in number, succumbed.[204] This was reflected in the mortality data for silicosis: although unofficial figures were considerably higher than those derived from the industry's records (12 per 1000 per annum), they were still so low as to be insignificant compared with other diseases.[205] What was a puzzle was the susceptibility to the disease of migrants. In providing the solution to this issue, which was especially important as it involved the bulk of the black workforce, the medical profession did not disappoint the mineowners.

Immediately after the Anglo-Boer War most doctors were of the opinion that the migrants' short contracts protected them from the ravages of the disease, whereas whites, who were exposed to dust for a long uninterrupted period, were particularly vulnerable.[206] The public believed this, too, hence the disease's nick-name, 'The White Death'.[207] In 1906 the research of a mine doctor, George Albert Turner junior, son of the Transvaal Medical Officer of Health, gave this belief enormous substance. In that year Turner's employers, the Witwatersrand Native Labour Association, the Chamber's recruiting agency, sent him on a fact-finding mission to the southern Portuguese East Coast provinces, the industry's single biggest source of African recruits. The purpose of his visit was to investigate the allegation that the industry was sending home silicotic and tuberculous mineworkers, who were infecting the rural Africans, formerly free of tuberculosis.[208] After a brief visit, during which he cursorily inspected the inhabitants of more than thirty rural communities for symptoms of the diseases, Turner reported that the prevalence of both illnesses was minimal.[209]

Despite the limitations of his research, based only on crude observation, the medical profession unquestioningly accepted his assumptions as facts: silicosis was negligible among migrant workers; their short contracts reduced their vulnerability to silicosis; and their 'rests' between contracts in their 'kraals'

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[202] Cd. 2104, 1904, p. 90; TMJ, April 1908, p. 220; SAMR, 15 Sept. 1905, p. 192, 14 Oct. 1911, p. 285; Rand Daily Mail, 11 Nov. 1910, 19 April 1912; Lancet, 16 Dec. 1911, p. 1745.

[203] SC 4, 1914, pp. 57, q. 326, B. G. V. de Witt Hamer.

[204] RMPC, 1902-1903, pp. 21, 25, qq. 67, 110-113, Dr L. G. Irvine and Dr D. Macaulay; Perm, N., 'Miners' phthisis: its compulsory prevention by means of dust allayers', South African Mines, Commerce and Industries, 10 Dec. 1904, p. 874; FRMRC, 1910, vol. 2, p. 263, Dr L. G. Irvine.

[205] Merriman Papers, correspondence, 1913, no. 47, memorandum from the Secretary for Native Affairs: van Niekerk, 'Miners' phthisis', pp. 33-34.

[206] Irvine and Macaulay, 'Safety measures', p. 365: Perm, 'Miners' phthisis', p. 874.

[207] Transvaal Leader, 11 Aug. 1910.

[208] TMJ, 1 Sept. 1905, pp. 25-26.

[209] Turner, G. A., Report on the prevalence of pulmonary tuberculosis and allied diseases in the kraals of the natives of Portuguese African territory, south of latitude 22°... (Johannesburg, 1906), pp. 7, 14.

at home restored their health.[210] Turner's report, which the Chamber immediately published, was convenient for both the medical profession and the industry. It confirmed the unfounded assumptions of most doctors; and it vindicated the mineowners' policy of employing short-term contract workers. The report also had long-term effects. Until the 1930s the medical profession saw no reason to conduct further research on the relationship between migrancy and silicosis. Likewise, the mineowners used Turner's findings, elevated to medical orthodoxy, to justify the perpetuation of the migrant labour system.[211]

In 1910, on the eve of Union, the report of the Mining Regulations Commission was finally published. Its 'sensational' findings outraged the public exposed for the first time to the realities of the carnage in the industry. The public's demand for substantial reforms was not because of pressure from the Witwatersrand doctors. Rather, it was because of their omissions.

Assessing the early-day role of the Witwatersrand medical profession

As this paper has shown, racial discrimination, in the guise of Social Darwinism, played an important role in promoting disparities between white and black mineworkers as regards their health services. But 'racism' was not the sole or even the major determinant of the overall quality of the industry's early-day health services.[212]

In the first two decades of the industry's history the gap between the standards of health care for white workers and blacks was not as wide as is all too often assumed.[213] In fact, white workers were also the recipients of inadequate health care, a circumstance which the concept of 'racism' cannot satisfactorily explain. After all, white mineworkers enjoyed a superior status in the labour hierarchy and were endowed with fair skins!

Like their 'inferior' black counterparts, white mineworkers, the so-called 'aristocrats of labour', were treated callously by those responsible for their welfare. Similarly, the spurious contention of the controlling bodies, that workers were responsible for their own illnesses, was not necessarily a racially-inspired argument: both white and black workers were told that their illnesses were self-inflicted. Nor was paternalism essentially the product of 'racism'; health officers believed that white miners as well as black mineworkers had to be protected from their allegedly harmful practices. Stereotypes of this sort were class-based rather than 'racist'.

Much was demanded of the general medical practitioner, the jack-of-all trades, who was expected to be an expert in all medical fields: from dispensing psychological advice and medicine to performing operations and delivering babies. On paging through the early-day South African medical journals one cannot help but be moved, even overwhelmed, by the conscientiousness of a great many individual doctors, who committed themselves unstintingly to the welfare of their patients. This is confirmed by their obituaries: many Witwatersrand doctors, when they died, were weary and strained from overwork. Their talents, too, were manifold; a great many strove for professional excellence, devoting their spare time to research and writing, and to preparing cases for group discussions.

All this provided the substance for George Bernard Shaw's complaint against doctors; they were too immersed in their work and too intent on earning good livelihoods to be the custodians of public health. For these reasons he believed that the onerous duty of guarding public welfare should be entrusted to state

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[210] SC 2, 1913, p. 117, qq. 1213-1214, Dr G. A. Turner; SC 9, 1913. Report of the Select Committee on European employment and labour conditions, 1913, p. 117, qq. 1213-1214, Dr G. A. Turner; van Niekerk, 'Miners' phthisis', pp. 30-31, 284-286.

[211] The prevention of silicosis on the mines of the Witwatersrand, (Unnumbered Union Government publication), 1937), p. 242.

[212] This is the argument of Julie Baker. See Baker, 'Silent crisis', pp. 14, 17-26b, and especially p. 13.

[213] There are very few studies devoted to the history of health and disease on the Witwatersrand gold mines. This wrong assumption has become commonplace, because most of the relevant literature focusses on the impact of apartheid on health without examining the actual origins of health policies. The otherwise incisive study by Cedric de Beer is typical. See de Beer, C., The South African disease: apartheid health and health services (Johannesburg, 1984), pp. 9-10, 70. For an excellent review of the literature, see Baker, 'Silent crisis', pp. 3-19 passim. Randall Packard's recent fine study of tuberculosis avoids this pitfall. For his brief but correct analysis of the origins and early development of the industry's health services in general, see Packard, R. M., White plague, black labour: tuberculosis and the political economy of health and disease in South Africa (Berkeley and Los Angeles, 1989), p. 3. (He is more ambiguous further on, pp. 13-14.)

medical officers of health.[214] He might have changed his mind, however, if he had been acquainted with Dr Charles Porter, Medical Officer of Health for Johannesburg.

Porter, who sat on many health commissions, was responsible for a variety of fruitful recommendations intended to improve the health of mineworkers. Nonetheless he, like Irvine and Macaulay, could not actually bring himself to the point of criticising the industry's responsibility for the very malpractices that needed to be reformed. In fact, in 1914 Dr Albert J. Gregory, retired Cape Medical Officer of Health and, significantly, not a Transvaaler, publicly censured Porter for his uncritical acceptance of the health care of African mineworkers. Porter's post, he alleged identified him 'intimately with the existing system of control'.[215] Nor was this the first time that Porter was publicly criticised; in 1913, in the Union House of Assembly, H. Mentz, the MP for Zoutspansberg, claimed that it was impossible for Porter to be objective about the health care of African mineworkers, 'because it might trench on his own work'.[216]

Porter was equally negligent about the living conditions of white miners. It was the Mines Department that had to remind him about the evils of the 'single quarters':

> Now what occurs on every mine is that men in varying stages of this highly contagious disease [tuberculosis] are accommodated in the same room with healthy young men. What is the inevitable result! The pthisical [sic] man by his habit of spitting about the floor conveys his disease to his fellow room mate. The latter continues to work underground. The disease rapidly develops under underground conditions and he goes to join the great majority. This state of affairs savours more of the ignorance of the middle ages than of the scientific enlightenment of the 20th. Century. What would the great medical authorities of the world say to a state of affairs which permits a man in the last stages of tuberculosis to be confined in a stuffy room with another man hitherto immune from the disease?[217]

It was only after 1910, when it became politically acceptable for him to do so,[218] that he advocated reforming the 'single quarters'.[219] Needless to say, such improvements now had the sanction of the Randlords.[220]

Conclusion

The economic interests of the mineowners largely shaped the shoddy fabric of the industry's early-day health services, and it was to these financial concerns that the medical profession pandered. As a group the doctors were cowed into silence and submission by the industry which dominated the community, and on which they also relied for their livelihoods.

This control could not have been possible without state support for the industry. The degree of backing varied with each successive government. But in the area of health care it was relatively consistent: notwithstanding the enactment by the state of health regulations, each government virtually allowed the industry a free hand.

The industry's commanding role with regard to health, explains why the medical profession's response to the two major post-war health crises in the industry - the high pneumonia mortality among Africans and the high silicosis mortality among white miners - was as undistinguished as it was apathetic. The losers were the mineworkers, both black and white. By being passive the doctors allowed the health of their charges to be sacrificed to the profits of the mineowners.

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[214] Shaw, 'Preface', p. 67.

[215] UG 34, 1914, Report of the tuberculosis commission, p. 258.

[216] Union House of Assembly Debates, H. Mentz, 13 May 1913, col. 2373.

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

[218] FRMC, 1910, vol. 1, pp. 44-46, 64-65.

[219] Porter, C., 'On back-to-back and similar imperfectly-ventilated dwellings: their defects, dangers and amendments', Transvaal Medical Journal, Jan. 1912, pp. 6-12 passim.

[220] BRA, HE, vol. 258, file 154, 'Report of sub-committee on health conditions on mines', recorded date 15 Nov. 1910; Letter Book of City Deep Limited, 1910-1911, J. Whitford to Chairman and Directors of City Deep Limited, 8 Feb. 1911.