"WORKING IN THE GRAVE": THE DEVELOPMENT OF A HEALTH AND SAFETY SYSTEM ON THE WITWATERSRAND GOLD MINES, 1900-1939.

THESIS

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"WORKING IN THE GRAVE": THE DEVELOPMENT OF A HEALTH AND SAFETY SYSTEM ON THE WITWATERSRAND GOLD MINES, 1900-1939.

> Working in the grave is most uncomfortable. You expect death to occur any time in your daily work routine.

(Tswana miner quoted in Moodie, T.D. "Mine Culture and Miners' Identity on the South African Gold Mines," in Bozzoli, B., Town and Countryside in the Transvaal [Johannesburg: Ravan Press, 1983] 180)

The earth will swallow us who burrow
And, if I die there underground,
What does it matter? Who am I?
Dear Lord! all round me, every day,
I see men stumble, fall and die.

(**In The Gold Mines** by B.W. Vilakazi)

Dedicated to the memory of my grandparents

ABSTRACT

This thesis analyses the establishment of a health and safety system on the Witwatersrand gold mines in the period between the end of the South African War and the eve of World War Two. The period has been chosen, firstly, because the South African War had seriously disrupted production and the industry virtually had to start up again from scratch; secondly, because it was during this period that mine and state officials began to seriously investigate the reasons for the appalling mortality and morbidity rates on these mines; and, thirdly, because during this period some improvements did occur which were significant enough to enable the industry to warrant the lifting, in the latter part of the 1930s, of the ban on tropicals, enforced since 1913 as a result of their extremely high mortality rate.

In the first thirty years of the twentieth century about 93 000 African miners died disease-related deaths and in the same period some 15 000 African miners were killed in work-related deaths. In attempting to establish why so many African miners died, the thesis attempts to identify the diseases and accidents that caused these deaths and considers what attempts were made to bring mortality and morbidity rates down.

Whilst the thesis is neither a history of gold mining in South Africa nor an economic history of South Africa in the period 1901 to 1939, it nevertheless, as detailed in the first chapter, places the health and safety system within the context of the wider political and economic forces that shaped the mining industry in this period.

The need for a productive and efficient labour force, vital for the industry's survival during a number of profitability crises in this period, forced the industry to reassess compound structures, nutrition and eventually the health of its work force. These issues of compounds, work and diet are discussed in chapters two, three and four.

Appalling living and working conditions led to a high incidence of pulmonary diseases - TB,

silicosis and pneumonia - which were the principal killers on the mines. Attempts to cure or prevent their occurrence are discussed in chapter five. Fear of disruptions to production ensured that the mining industry eventually also devoted considerable resources to accident prevention, a theme which is discussed in chapter six.

The thesis concludes that the mining industry for much of this period was able to determine the pace of change; neither state officials nor African miners were able to significantly alter the tempo. In fact the industry was so successful that it was able to convince a number of government commissions in the 1940s that the migrant system had to stay, to ensure the well-being of the miner. This meant that despite considerable time, money and effort being spent on establishing a health and safety system on the gold mines, the mining industry was still of the opinion that the health of their workers was best served if they were sent home.

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Abbreviations used in Notes

ASL - African Studies Library

COMA - Chamber of Mines Archives

COMAR - Chamber of Mines Annual Reports

GES - Department of Public Health Archives, Pretoria

GME - Government Mining Engineer

GNLB - Government Native Labour Bureau

JSAS - Journal of Southern African Studies

MO - medical officer

MMOA - Mine Medical Officers' Association

MMOAA - Mine Medical Officers' Association's Archives

NAD - Native Affairs Department

NGC - Native Grievances Commission

PMMOAA - Proceedings of Mine Medical Officers' Association

RDM - Rand Daily Mail

SA - South Africa

SAB - South African Archives, Pretoria

TA - Transvaal Archives, Pretoria

WNLA - Witwatersrand Native Labour Association

ACKNOWLEDGEMENTS

This thesis has been a long time coming and there is no adequate way for me to thank all of the people who along the way encouraged and supported me, tolerated and coaxed me, and, in general, made this dissertation possible. I can single out only a small number of the people who were most critical in this process.

First, and foremost, I would like to thank Professor Rodney Davenport for all the supervision he gave me over the past four years.

Secondly, because of Professor Davenport's early retirement, Professor Roger Southall took over supervision and was extremely helpful in sharing with me his enormous knowledge on Southern African labour issues.

Thirdly, Dr Trudy Thomas and Dr Hilary Southall deserve special mention for reading and re-reading chapters three, four and five and making them medically more acceptable. Any medical misinformation that remains is entirely due to my not having got past the first year of a MBChB.

Fourthly, I would like to express my gratitude to Dr Patrick Harries, whose interest in this whole area rubbed off on me and who steered me towards a number of useful sources.

Fifthly, the nature of this type of research has meant that I now owe favours to a number of librarians and archivists throughout South Africa. I would particularly like to thank the staff of the Cory Library, Rhodes University and the archivists at the Chamber of Mines and at the Mine Medical Officers' Association's archives.

Sixthly, I would like to record my gratitude to the people who have read either the whole thesis or parts of it. My father deserves special mention in this instance for his help with the proofreading. I would also like to thank Gareth Cornwell and Richard Bouch for the useful comments they had to make on this thesis.

Finally, as I attempt to follow in my Grandfather's footsteps - he was also a historian - I would like to dedicate this work to his memory as well as to the memory of my other grandparents.

M.J. Smith
Grahamstown
December 1992

Introduction

In 1947 the Chamber of Mines's executive committee, the Gold Producers' Committee (GPC), presented the following evidence to the Fagan Commission:

> The mining industry has through the course of years steadily built up complete medical services for its Native labour force. At this stage for approximately 300 000 labourers there are 37 well-equipped mine hospitals with over 7 000 beds providing accommodation on any one day for a little over 2 per cent of the labour strength. This number of beds for many years past has been more than adequate. There are more than 60 mine medical officers. The nursing staff consists in the main of qualified male European nurses and probationers with trained and training Native orderlies. In four hospitals European sisters are employed and in three of these Native women are also trained as nursing assistants. Twenty-five hospitals are licensed training hospitals for European male nurses, so that the staff requirements are largely met by the Industry's own training hospitals.[1]

The above is an example of the propaganda that the Chamber has been disseminating ever since. The statistics quoted suggest that on the gold mines there existed an impressive health and safety system, unrivalled in Southern Africa. However, they do not tell the whole story. No mention is made of the fact that in the first thirty years of the twentieth century 93 000 African miners died disease-related deaths on the Witwatersrand gold mines, nor of the fact that, in the same period, about 15 000 miners were killed in work-related accidents.[2] In other words, roughly ten miners died a day.

The present thesis therefore attempts to establish why so many African miners died, what caused their deaths and what attempts were made to bring mortality and morbidity rates down. In addressing these questions this study draws on the work of a small number of historians who have focused either directly or indirectly on the issues of health and safety on the mines. While a significant amount of historical literature, published largely since 1970, exists on health or health-related issues in Africa, South African

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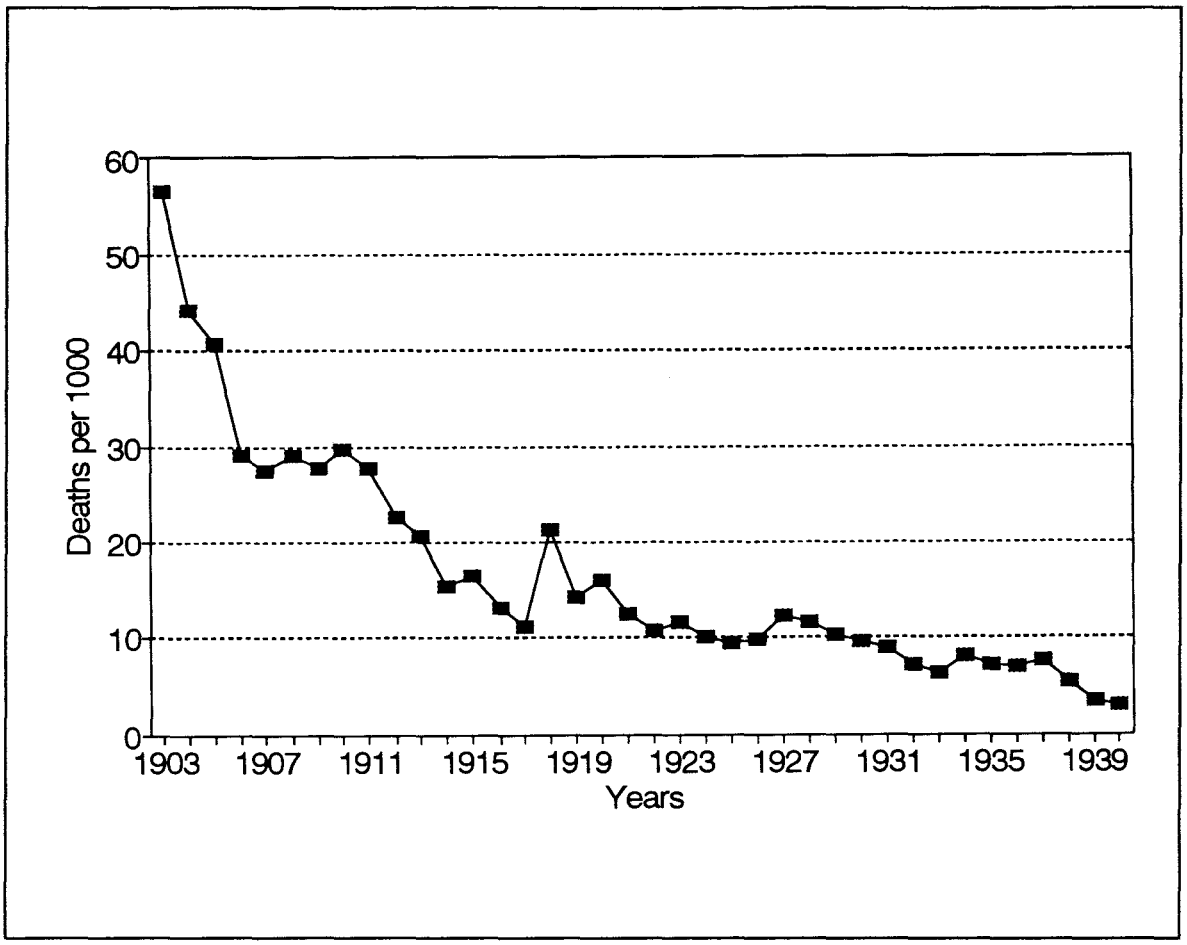
[1]Report of the Native Laws Commission 1946-1948, UG28-1948 35.

[2]Baker, J.J., "'The Silent Crises,' Black Labour, Disease, and the Economics and Politics of Health on the South African Gold Mines," PhD thesis, Queen's University, Canada, 1989 28. The annual reports of the Chamber of Mines confirm these figures. These statistics do not include the thousands of miners who were repatriated and went home to die.

historians have been extremely slow to follow suit.[3] While many historians continue to write about Apartheid, its origins and effects, few seem to have taken cognisance of the simple fact that the denial of significant health care to the majority of the people of South Africa has been one of Apartheid's greatest crimes.



Graph 1: Disease Mortality Rate for African miners on the Witwatersrand Gold Mines, 1903-1940. *Source: Chamber of Mines Annual Reports.*

This does not imply that had there been a health system the health of the nation would have been

[3]For a helpful survey of historical writing that focuses on health in South Africa see van Heyningen, E., "Epidemics and Disease: Historical Writing on Health in South Africa," South African Historical Journal, 23 (1990): 122-133. There are a number of similar surveys of work that examines health issues in Africa. See, for example, Prins, G., "But what was the disease? The Present State of Health and Healing in African Studies," Past and Present, 124 (1989): 159-179; or Feierman, S., "Struggles for Control: The Social Roots of Health and Healing in Modern Africa," African Studies Review, 28.2-3 (June/September 1985): 73-147.

satisfactory. Nor is people's health some isolated entity, only to be treated within the aseptic corridors and wards of hospitals. On the contrary, health is an integral part of any socio-economic system and cannot be divorced from issues such as adequate housing, nutrition and sanitation. The World Health Organisation defines good health as a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".[4] Therefore it can be argued that one should look not only at the death toll on the mines, but also at the fact that thousands of miners, both ill and dying, were repatriated to the rural areas where no statistics were recorded and thus no one knows how many died.[5] Dr George Gale drew the Fagan Commission's attention to this issue when he argued that, while he agreed with the assertion that miners received good medical care on the mines,

> the mine medical services protect the mine-worker only so long as he is on the mine. They do not extend to the rural area to which he returns when his health breaks down **owing to the conditions of migratory labour**. Obviously they cannot: but the point is that the mine medical services do not meet the really serious detrimental effects, qua health, of the migratory system.[6]

Three recent historical studies have shed considerable light on the state of health on the gold mines. Julie Baker's thesis, "The Silent Crises," competently examines the issues of health care, sanitation, nutrition and alcohol abuse; but surprisingly ignores occupational diseases and accidents. Randall Packard's White Plague, African Labour, is a useful history of tuberculosis (TB) in South Africa, and also provides some valuable insights into both disease in the compounds and the effects the migrant labour system had on the rural areas.[7] Finally, Elaine Katz's PhD, "The White Death: Silicosis (Miners' Phthisis) on the Witwatersrand Gold Mines, 1886-1910," convincingly disputes the long held

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[4]Apartheid and Health. (Geneva: World Health Organisation, 1983) 1.

[5]According to various fragments of evidence, it would appear that on average the gold mines annually repatriated about 2000 miners due to disease-related afflictions. The majority of these would have been lung diseases, for which there was no cure in the first four decades of this century. A rough guesstimate is that about 80 000 miners were repatriated, of whom about 50% would have died, from lung diseases, within a couple of years after returning home.

[6]My emphasis (UG28-1948 38).

[7]Packard, R., White Plague, Black Labour. (London: James Currey, 1989).

belief that African miners were not as badly afflicted by silicosis as white miners were.[8] A fourth and earlier study, Cartwright's Doctor on the Mines is marred by the author's expressed wish to tell "the story of how primitive tribesmen from the most remote corners of Africa have come to the mines and have been taught that the White man's medicine is more powerful than the witch-doctor's".[9] Nevertheless, by virtue of the author's position as the Chamber of Mines's "official" historian he was able to draw on evidence no one else has in all probability seen. Therefore the book provides some useful information on the medical care administered to African miners. Also of importance is Howard Phillips's pathbreaking study of the Spanish Influenza epidemic in October 1918 in which he devotes a chapter to the flu's impact on the mining industry's workers and, of course, its impact on production.[10] A number of other works have also touched on health-related issues on the gold mines.[11]

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[8]Katz, E., "The White Death: Silicosis (Miners' Phthisis) on the Witwatersrand Gold Mines," PhD thesis, University of the Witwatersrand Gold Mines, 1990.

[9]Quotation taken from the book's dust-jacket. Cartwright, A.P., Doctors of the Mines. (Cape Town: Purnell, 1971). The book was published to mark the Mine Medical Officer's Association's 50th anniversary. Unfortunately the book has not a single reference, nor does it have a bibliography.

[10]Phillips, H., 'Black October': The Impact of the Spanish Influenza Epidemic of 1918 on South Africa. Archives Year Book for South African History Series 53.1. (Pretoria: Government Printer, 1990).

[11]The following works make some mention of health issues on the gold mines, but the list is not exhaustive: Callinicos, L., Working Life 1886-1940. 2 vols. (Johannesburg: Ravan Press, 1981 & 1986). Jeeves, A., Migrant Labour in South Africa's Mining Economy. (Johannesburg: University of the Witwatersrand Press, 1985). Kallaway, P., & Pearson, P., A History of Working Class Life Through Pictures. (Johannesburg: Ravan Press, 1986). Kennedy, B., A Tale of Two Mining Cities. (Johannesburg: Ad Donker, 1984). Malan, M., In Quest of Health. (Johannesburg: Lowry Publishers, 1988). Richardson, P., Chinese Mine Labour in the Transvaal. (London: Macmillan, 1982). Simons, J., & R., Class and Colour in South Africa 1850-1950. (London: IDAF, 1983; rpt. London: Penguin African Library, 1969). Wilson, F., Labour in the South African Gold Mines, 1911-1969. (Cambridge: Cambridge University Press, 1972). Burke, G., & Richardson, P., "The Profits of Death: A Comparative Study of Miners Phthisis in Cornwall and the Transvaal, 1876-1918," JSAS, 4 (1978): 147-171. Leger, J., "Key Issues in Safety and Health in South African Mines," South African Sociological Review, 2 (April 1990): 1-48. Packard, R.M., "Tuberculosis and the Development of Industrial Health Policies on the Witwatersrand, 1902 - 1932," JSAS, 13 (January 1987): 187-209. ---, "Industrial Production, Health and Disease in Sub-Saharan Africa," Social Science and Medicine, 28 (1989): 475-496. Simons, H.J., "Death in the South African Mines," Africa South, 5 (July - September 1961): 41-55. Fraser, M., "The Introduction and Early Development of Health and Safety Measures in South African Mines in the 20th Century," presented at International Mining History Congress, Bochum, September 1989. Katz, E., "Silicosis on Witwatersrand Gold Mines with Particular Reference to the Miners' Phthisis Commission of 1902 to 1903," presented at History Workshop, University of Witwatersrand, February 1978. Moroney, S., "Industrial Conflict in a Labour Repressive Economy: Black Labour on the Transvaal Gold Mines," Honours dissertation, University of the Witwatersrand, Johannesburg, 1976. Richardson, P., "Miners' Phthisis in the Transvaal Gold Mining Industry, 1886-1918," presented at the African Studies Association of Great Britain Conference, 1978. Van Aswegen, H.J., "'Miners' Phthisis:' Health Politics on the Gold Mines of the Witwatersrand, South Africa, 1886-1920," presented at International Mining History Congress, Bochum, September 1989.

While a number of historians have indeed touched on health issues, few, as already indicated, have discussed these issues at great length, and none have discussed health and safety issues as integral parts of the whole system.[12] The British historian John Benson has argued that

> Economic and Labour historians would do well to remember that even in an industry as notoriously strike prone as coal mining, in a normal year between 50 and 100% more working days were lost from non-fatal accidents than from industrial disputes.[13]

Benson is referring to the British coal mining industry but the point he makes is as relevant for historians writing about the Witwatersrand gold mines. Just as many historians focusing on Britain's coal industry have ignored the health and safety aspect of the industry, so too have many of the historians who have focused on the Witwatersrand. Nevertheless, precisely because so much has been written on certain aspects of the mining industry, especially on issues of economics and labour relations, the thesis will only refer to these topics where necessary, and instead grant primacy to health and safety issues. In other words, this thesis is neither a history of gold mining nor an economic history of South Africa in the period 1901-1939; rather, it is a medical history of African miners on the Witwatersrand gold mines.

However, bearing in mind Packard's insistence that historians, when examining health issues, must move beyond "immediate causal linkages...and examine the wider political and economic forces which determine the shape of industrial development", the first chapter examines the context in which the mining industry was located in the first four decades of the twentieth century.[14] These decades have been chosen for three reasons.

Firstly, the South African War disrupted the industry sufficiently to halt production almost altogether,

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[12]One is, of course, acutely aware that one should be thankful that a number of studies exist which deal with health issues of African miners. There is a vast lacuna when it comes to the documenting of rural health problems. Feierman argues that this is the result of officials collecting only certain data. Thus while accidents are well reported because they happen at the workplace, degenerative diseases are not so well reported as miners are migrants and usually return home to die (1985 104).

[13]Benson, J., "Mining Safety and Miners' Compensation in Great Britain, 1850-1900," paper presented at the International Mining Congress, Bochum, September 1989, 7.

[14]Packard "Industrial production," 475-496.

so that the industry virtually had to start up again from scratch. As a result of both the war and of little work being available, most of the labourers left the mines. Attempts by both the industry and the state to draw this labour back to the mines were not entirely successful, forcing the industry to examine the reasons for this shortage. Thus the war precipitated a major reassessment of labour relations and conditions on the mines. It turned out that a primary reason for the shortage of labour was the state of work and living conditions for African miners. There is little evidence pertaining to health and safety issues before the South African War, but what there is indicates a lack of concern by the industry.

Secondly, the transformation of the mining industry, from open cast mining to deep level mining, required far more control over the workforce. Deep level mining, and the additional problem of low grade ore, required a productive and efficient labour force, which in turn forced the industry to reassess compound structures, nutrition and, ultimately, its responsibility for the health of the labour force. These issues - compounds, work and nutrition - will be discussed in chapters two, three and four.

Thirdly, by the start of World War Two, the mining industry not only had a body to oversee all medical matters on the mines, the Mine Medical Officers' Association (MMOA) established in 1921, but it had convinced the government that conditions had improved significantly enough to warrant the lifting of the ban on tropicals during the latter part of the 1930s.[15] Tropicals had been banned in 1913 as a result of their extremely high mortality rate from diseases, especially pneumonia. Pulmonary diseases - TB, silicosis and pneumonia - were the principal killers on the mines. The attempts to either cure or prevent them are discussed in chapter five. Finally, the fear of disruptions to production also ensured that the mining industry devoted considerable time, effort and money to improving accident rates, a theme which is discussed in chapter six.

While the study hopes to assess critically the health and safety system that existed on the mines in the period 1900-1939, it is hoped that the system will not be seen as "all bad". The French medical

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[15]Tropicals were miners who were recruited North of Latitude 22° South, mainly from where Malawi is today.

historian J-P. Goubert warns that

> it is not enough to make a quantitative estimate of the alimentary ration, to stress the imbalance of the diet, to denounce the lack of hygiene in having hospital beds occupied by several patients, and to stigmatise the impotence of pre-scientific medicine. We must also - and therein lies our task as historians - come to grips with a society of the past as something other than just the negation or the absence of ours.[16]

The thesis therefore also examines the attempts made to improve this system. The role of state inspectors, mine doctors and the miners themselves will be examined to ascertain how and why changes, often for the better, did occur on the mines.

Note About Sources

An obvious omission from this study is the voice of African miners themselves: how they perceived their illness and the health care provided by the mining industry. This omission is not from choice. The nature of South Africa's political history is such that there is precious little in the archives which deals with the views of black South Africans. Where there is evidence it usually tells us more about white perceptions of Africans than it does about black South Africans. Almost all the government commission reports that were perused in preparation for this thesis tell of how white commissioners received evidence from white "experts" about problems either "caused" by Africans or in which Africans featured prominently.[17] Furthermore, while there is ample evidence of the different approaches doctors used to deal with the myriad of medical issues that the mines produced, there is very little on how miners viewed this treatment. Oral testimony would have been an obvious solution, if one could find the few miners who are still alive to be interviewed. Coupled to this is the difficulty (and I know, as I tried) of finding a willing sponsor to fund the type of expedition needed to track down such a small group of people. Nevertheless, it is hoped that this thesis will provide the background for a more ambitious, and altogether necessary, study of African perceptions of the whole mining experience. Some such evidence has been found, however, and where possible it has been included. It is greatly to

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[16]Goubert, J-P., "Twenty Years On: Problems of Historical Methodology in the History of Health," in Porter, R., & Wear, A., (eds) Problems and Methods in the History of Medicine. (London: Routledge & Kegan Paul, 1987) 43.

[17]Feierman makes the same point when he argues that because official statistics are skewed towards the white population, or, in some cases, towards urban blacks, and thus ignore the rural areas, "the pattern of data collection" affects "the scholarship which relies on it" (1985 103).

be regretted that the records of the one commission where evidence was specifically sought from African miners, the 1913-14 Buckle Commission, have suffered an unfortunate mishap. The State Archives, in Pretoria, have lost the box that contains almost all the testimonies taken from African miners.[18]

Evidence is, of course, not value free, especially so when people are expressing opinions for which they do not always have any proof.[19] Furthermore, the medical statistics consulted have presented considerable problems of validity and interpretation. Whilst the Chamber, the MMOA and various state departments have recorded reams of evidence, especially health statistics, it has not always been clear to the researcher that the figures are accurate. Dr A.J. Orenstein's health report of 1937 had the following message attached to it:

> It was discovered a few days ago that owing to the carelessness and dishonesty of two hospital clerks the data which [was] submitted for analysis to Professor Dalton are unreliable insofar as the City Deep experiments are concerned".[20]

Charles van Onselen, in his social history of the Witwatersrand, has castigated the relevant institutions, especially the mining houses, for their eclectic archival practices. He noted, correctly, that whilst these companies "played an unashamedly public role in the making and shaping of South African society", they are extremely reticent in allowing historians to examine their archives.[21] I also encountered a very mixed response from the mining houses. The Chamber of Mines and the Mine Medical Officers' Association were extremely helpful in providing me with unlimited access to the files I chose to examine. All the other mining houses claimed they had nothing of interest for me to examine. This

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[18]Report of the Native Grievances Inquiry, UG37-1914 (NGC). The missing box is box 1, K358, Native Grievances Commission, 1914.

[19]Prins argues that one of the exciting transformations currently under way in studies of health and healing in Africa is that historians are moving away from the idea that European medicine is all good and patients are passive sufferers (161). Porter and Wear make much the same point in the introduction to their book. They argue that as studies have moved towards examining social history they have shown how medicine "maintains class systems", "perpetuates gender roles" and is "insidiously repressive" ("Introduction," in Porter et al. 1-14).

[20]Orenstein, A.J., "Report for the Year 1937," (Johannesburg: Health Department, Central Mining-Rand Mines Group, 1937).

[21]Van Onselen, C., New Babylon. (Johannesburg: Ravan Press, 1982) Vol. 1 of Studies in the Social and Economic History of the Witwatersrand, 1886-1914. 2 vols. xii.

was particulary surprising as one particular archivist, who had earlier refused me permission to examine "her" archive, later presented a paper on health and safety issues based on archival material she had had at her fingertips. Even more distressing is the policy of certain mining houses which allow American and British historians to examine their archives, but continue to refuse permission to South Africans. Apparently the way round this is to study overseas and request permission while outside the country!

A further cause of extreme concern is suggested by the comment which greeted my arrival at the MMOA's archive: "It's a pity you weren't here two years ago, as we have just burnt most of our records so that we could cope with the move". Whilst the Chamber have sensibly microfilmed all their records, at considerable expense, other mining houses might not feel so philanthropic and an important part of our country's history might literally go up in smoke.

Chapter One

A Crazy Patchwork: A Political Economy of Health in South Africa, 1900-c.1939

> From the time of South Africa's mineral discoveries in the last third of the nineteenth century, fears that epidemic disease 'would know no colour bar' and thus threaten whites, or that it would interfere with the reproduction of the labour force, lay behind much public health legislation and state intervention.[1]

In the 1944 Gluckman Report on the state of the health system in South Africa, the then President of the South African Medical Association referred to the system as a " 'crazy patchwork' of public medical services, determined not by scientific principle but by accidents of constitutional development in South Africa".[2] The evolution of this system occurred primarily between the 1900s and the 1930s. The same period saw a health and safety system develop on the Witwatersrand gold mines. Therefore, to understand the system on the mines, an understanding of the health system that evolved nationally is vital. This chapter seeks to contribute to that understanding by locating the discussion within the changing political economy of South Africa.

In a study of this nature it would be supererogatory to attempt to detail the changing nature of South Africa's political economy in the period 1901 to the start of World War Two, since an enormous literature exists on this topic, and space does not permit more than a perfunctory overview of the period here. Furthermore the development of modern South Africa will be discussed only in so far as it made an impact on the development of the health service and the development of the mining industry. More detailed reference to specific politico-economic events will be included when appropriate in the course of the thesis. The periodization that follows is dependent on the work of Terreblanche and Nattrass, and

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[1]Marks, S., & Anderson, N., "Typhus and Social Control: South Africa, 1917 -1950," in Macleod, R., & Lewis, M., (eds) Disease, Medicine and Empire: Perspectives on Western Medicine and the Experience of European Expansion (London: Routledge, 1988) 259.

[2]Cited in Marks et al. "Typhus and Social Control" 259 (Report of the National Health Services Commission [Gluckman Commission], UG30-1944).

readers will note that it is not significantly different from what a number of other historians have used.[3]

The Mining Industry in the Reconstruction Period

The South African war had a profound effect on South Africa. According to van Onselen the war "severely disrupted the mining industry and caused indirect losses estimated at £25 million as capital lay in enforced idleness for many months".[4] Naturally the gold mining industry desperately wanted stability to ensure the smooth running of its operations, which it achieved by establishing a working relationship with the occupying British administration.[5] The war had also seen the destruction of farms and the transport network, which resulted in food shortages and famine prices for the little food that was available. It was this "enforced idleness" of the mining industry, and the fact that African miners were either systematically drafted into the armies of both the British and the Zuid-Afrikansche Republiek (ZAR), or forced to work on the few mines that were still operating, that led to the majority of African gold miners leaving the Rand at the onset of war.[6] At the war's end an acute labour shortage inhibited any attempts at quick resuscitation of the industry. Jeeves has noted how only a few thousand of the 100 000 Africans in employment in mid 1899 were still on the job in early 1902. By 1910, however, the African labour force on the gold mines topped 200 000 miners.[7]

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[3]Terreblanche, S., & Nattrass, N., "A Periodization of the Political Economy from 1910," in Natrass, N., & Ardington, E., (eds) The Political Economy of South Africa (Cape Town: Oxford University Press, 1990) 6-23. For other examples see the work of D. Hobart Houghton and J. Dagut. Naturally it has been noted that there is some debate over the actual dates used but, again, space does not permit more than a brief mention of this debate.

[4]Van Onselen, New Babylon 1: 24.

[5]Yudelman, D., The Emergence of Modern South Africa (Cape Town: David Philip, 1984) 52. A further measure of the crises the gold mining industry found itself in was that only half the mines were liable for profit tax in 1902-1903: for the details see Richardson, P., Chinese Mine Labour in the Transvsaal (London: Macmillan, 1982) 16.

[6]For more details see Cammack, D., The Rand At War, 1899-1902 (London: James Currey, 1990) 71 & 84.

[7]For a full account of the mines' struggle to ensure a constant labour supply read Jeeves, A.H., Migrant Labour in South Africa's Mining Economy: The Struggle for the Gold Mines' Labour Supply, 1890-1920 (Johannesburg: Witwatersrand University Press, 1985). Cammack puts the figure of African miners who were forced to remain on the mines at between 12 000 and 13 000. Miners apparently had their passes confiscated to ensure they did not desert. Furthermore, martial law was used to enforce control and keep the miners on

A crucial reason for this expansion of the labour force was the shift away from outcrop mining to deep level mining which was consolidated in the period immediately after the war. Open level mines, which dominated the industry prior to the South African war, tended to have a much higher grade of ore than the deep level mines. Thus in deep level mining far more ore had to be extracted before profits could be made, a factor which required both large amounts of labour and significant technological skills (see chapter two). Moreover, this type of mining was not only labour intensive but required far more financial commitment than previous methods because "deep level mining required the bulk of the investment for shaft sinking, equipment, and ore reduction works years before production and therefore earnings could benefit".[8]

A further problem that faced the mining industry throughout the period under discussion was inflation. Profits were obviously dependent on crushing as much rock as possible for as little as possible. Nevertheless, in the period between 1897-1937 working costs actually declined from 29s.6d to 19s. per ton.[9] One should also not lose sight of the fact that the period immediately after the war was one of reconstruction in the Transvaal, which meant that the mines were in direct competition with other employers for labour. The mines' subsequent failure to attract labour led to the Chinese labour

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the mines because they had had their wages slashed and were therefore unwilling to work on the mines (Cammack 85-87). Undoubtedly, this provided a further motivating factor for black miners to avoid the mines immediately after the war. Katz speculates that just as silicosis had killed a high proportion of white miners by the end of the war so too had it killed a number of African miners. Speculating further, she argues that African miners would have been aware of this and may have decided, where they had the choice, to avoid the mines during the reconstruction period (810-811).

[8]Jeeves Migrant Labour 3-36. Peter Richardson argues that the problems with the fixed gold price were compounded not only by the extensive reliance on imported stores but also by shipping, insurance, brokerage and refining charges (Chinese Mine Labour 8-9). Merle Lipton argues that a further reason was the "diminishing returns" factor as the better seams were worked first (115). Francis Wilson identifies four significant periods in which the gold price oscillated, namely: 1. 1887-1919 when gold is bought at a set price by Britain, who was on the Gold Standard. 2. 24 July 1919 Britain abandons the gold standard and the gold price increases. 3. April 1925 Britain rejoins the gold standard and the price is set until December 1932. 4. December 1932 Britain again abandons the gold standard and consequently the price of gold rises (Labour in the South African Gold Mines, 1911-1969. [Cambridge: Cambridge University Press, 1972] 34).

[9]Hobart Houghton, D., & Dagut, J., 1919-1970, 3 vols. (Cape Town: Oxford University Press, 1976) 3: 105. Working costs also fell as result of more efficient technology and the declining "real" and actual wage of the black miners (see chapter two). See also Richardson, P., & van Helten, J.J., "Labour in the South African gold mining industry, 1886-1914," in Marks, S. & Rathbone, P.(eds) Industrialisation and Social Change in South Africa (London: Longman, 1982) 77-98.

experiment. Chinese worked on the mines from late 1904 until 1907 when the newly elected Liberal party in Britain banned the importing of any more labour from China.[10] The importation of labour was thus but a temporary solution to the labour shortages, and the ban on recruitment abroad meant the mining industry had to develop replacement strategies. This led to the Government Native Labour Bureau (GNLB) being founded in 1907 to recruit labour from the Cape and Natal.[11]

The development of the group system on the mines also contributed to keeping costs low. Each group was basically a large corporation that possessed "strong financial resources, long and intimate experience of mining enterprises and efficient technical and administrative staffs".[12] Essentially in place by 1897, the group system allowed for the administration of mines to be centralised, thereby saving individual mines the costs of secretariats. Furthermore, the group system allowed mines within a group to share expensive "consulting engineers and technical advisors", facilitated the bulk buying of stores and, when necessary, also enabled financial expertise and capital to be shared.[13] These groups or financial houses were as follows:

1. The Consolidated Gold Fields of South Africa Ltd. - Established in 1887 by Cecil Rhodes.
2. Johannesburg Consolidated Investment Company Ltd. - Established in 1889 by an amalgamation between the Barnato Group and the Robinson Group.
3. Rand Mines Ltd. - Established in 1893 by Wernher, Beit and Company.
4. General Mining and Finance Corporation Ltd. - Established in 1895 by the Albu Group.

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[10]For details of the chinese experiment read Peter Richardson's Chinese Mine Labour.

[11]The GNLB was established by General Louis Botha, initially as a sub-department of the Native Affairs Department (NAD). However it later became independent. Jeeves stresses that its creation was not merely a form of compensation to the mines for losing the Chinese but also because of the Chamber of Mines's "demonstrated inability" to maintain an adequate recruiting system for the industry (Migrant Labour 77). For more details see Jeeves, Migrant Labour 76-82.

[12]Martin, J., "Group Administration in the Gold Mining Industry of the Witwatersrand," Economic Journal, 39 (December 1929): 536-553.

[13]Martin 536-553. Finance capital was, of course, an important factor in any mining equation. Throughout the period under discussion investment was dominated by overseas capital. This was not unique to the mining industry but applied in other spheres as well. The banking industry, for example, was dominated by the "big 3" -Standard (British), Barclays (British) and the Netherlands Bank (Dutch) up until 1941 when Volkskas began to make inroads into the three's assets. Furthermore it was not till 1920 that South Africa had its own Reserve Bank (Hobart Houghton et al. 3: 191-195).

5. Union Corporation Ltd. - Established in 1897 by Mr A. Goerz.
6. Anglo American Corporation of South Africa Ltd. - Established in 1917 by Sir Ernest Oppenheimer.
7. Anglo-Transvaal Consolidated Investment Company Ltd. - Established in 1933 by Messrs Hersov, Mendell and Erleigh.[14]

Mining houses not only played a significant role in the development of the mining industry, but were also important actors in South Africa's history. The relationship between these mining groups and the South African state has led to considerable debate amongst historians which is still far from being resolved. Space does not permit doing justice to the debate but passing reference will be made to this relationship throughout the thesis. During the first decade of the 20th century the alliance, formed during the industry's early days, between the mining companies and English-speaking South Africans led to the creation of the South African Party, who were in opposition to the other grouping, Afrikaans speakers aligned at first to the Het Volk and later the National Party. It is, of course, incorrect to portray these parties as simply parties of language differences, or as fundamentally disparate politically. Suffice it to say that South African politics was not homogenous, and that the State and capital, as represented by the mining companies, did not work hand in hand throughout this period. What follows in later chapters will be an attempt to show that the mining industry did not always have the state's interest at heart, and vice versa.

While political groupings were being reshaped nationally in the wake of the South African War significant changes were also occurring at a local level. Foremost amongst these was the drive, which had begun in some areas before the war, to enforce segregation between peoples of different colour. During the Reconstruction period local government strategies were dominated by the concept of a physical and moral "cordon sanitaire". Its principal aim was to establish a physical distance between white and African living areas, as the latter's inhabitants were metaphorically seen to be carriers of infectious diseases. As Swanson has commented, "medical officials and other public authorities in South Africa at the turn of this century were imbued with the imagery of infectious disease as a societal metaphor, and...this metaphor powerfully interacted with British and South African racial attitudes to

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[14]For an anecdotal account of the formation of these groups read Cartwright, A.P. The Gold Mines (Johannesburg: Purnell, 1962). See also Kubicek, R.V., Economic Imperialism in Theory and Practice (Durham, N.C.: Duke University Press, 1979).

influence the policies and shape the institutions of segregation".[15] Urban slums were seen to be a "menace to the health of their inhabitants and indirectly to the health of those in the towns". Urban dwellings, especially those that housed Africans, were seen by officialdom as the major reason for the spread of contagious diseases. In official eyes that was where

> the greatest fault must be found. With few exceptions they are a disgrace, and the majority are quite unfit for human habitation...nothing more than hovels, constructed out of bits of old packing-case lining, flattened kerosene tins, sacking and other scraps and odds and ends...the dwellings are low, dark and dirty, generally encumbered with unclean and useless rubbish, mud floors are the rule, often below the ground level and consequently sometimes apt to be flooded in wet weather. Overcrowding is frequent: and altogether one could hardly imagine more suitable conditions for the spread of tuberculosis.[16]

It was these appalling living conditions that ultimately helped in the spreading of the bubonic plagues that swept South Africa at the turn of the century. Moreover these plagues "became a dramatic and compelling opportunity for those who were promoting segregationist solutions to social problems".[17] In other words, Africans were moved into "new" locations on the periphery of urban areas. However these "new" townships were nothing but insanitary dumping grounds. The death of fifty Indians from the plague in Johannesburg in 1904, for example, prompted health authorities to seal off the location and move its inhabitants twelve miles from town to Klipspruit, an area originally intended for sewerage purposes. In 1906 many Africans were also moved there.[18] The removals were overseen by the

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[15]Swanson, M.W., "The Sanitation Syndrome: Bubonic Plague and Urban Native Policy in the Cape Colony," Journal of African History, 18 (1977): 387. Lyons in her work on sleeping sickness epidemics in the Belgian Congo noted how between 1903 and 1909 a "cordon sanitaire" was imposed by colonial officials to prevent the epidemics from spreading further. This action, according to Lyons, "reflected the paternalistic nature of Belgian colonial policy in which health priorities formed a part of the justification for the methods of the social engineer. African societies, like the labouring classes in Europe, had, it was felt, to be controlled for their own protection" (Lyons, M., "Sleeping Sickness Epidemics and Public Health in the Belgian Congo," in Arnold, D., (ed) Imperial Medicine and Indigenous Societies [Manchester: Manchester University Press, 1988] 105-124).

[16]Quoted in Report of the Tuberculosis Commission, UG34-1914 126. It should be remembered that "in an era of competitive imperialism persistently high levels of epidemic mortality were seen as a mark of poor colonial management" ("Introduction," in Arnold 14).

[17]Swanson 387.

[18]Kennedy, B., A Tale of Two Mining Cities: Johannesburg and Broken Hill, 1885-1925. (Johannesburg: Ad Donker, 1984) 43-44. The previous year the South African Native Affairs Commission, under Sir Godfrey Lagden, had issued its report in which it "gave approval to the systematic establishment of segregated locations for urban Africans" [Davenport, T.R.H. South Africa: A Modern History. 3rd ed. (Johannesburg: Macmillan, 1987) 229].

Municipal health board, which was established, as were a number of others in the Transvaal, in 1901. They were the first attempt by the government to begin addressing health issues in the Transvaal.[19] Other provinces had already established local level committees to confront the rising tide of disease in South Africa and to cope with the infusion of people into the urban areas, whose population increased by 200 per cent between 1891 and 1911.[20] At the same time the state, primarily the NAD, was having to convince the mining houses to improve the living conditions of their African work force so that the compounds would no longer be a health threat (see chapter three). Ironically, though improvements took place the miners continued to be a major health threat for years to come, as Marks and Anderson have noted:

> The interaction between disease in the mines and locations, the migrant labour system and the spread of ill-health, especially TB, in the countryside was complex. For it was not simply the return of the migrant from the unhealthy towns and mines which led to the alarming spread of disease in the inter-war period. The diseases were not automatically transferred to the rural areas. The accelerating spread of TB, malnutrition and venereal disease in the "reserves" from the 1920s resulted from the migrant labour system and the low wage urban economy with the simultaneous and connected impoverishment of the countryside.[21]

The NAD, which dealt with the mining industry on a daily basis, was created by the British colonial office along with several other cognate departments, thus leading eventually to what Yudelman refers to as a "modern civil service, vital for gathering information with which to shape government policy".[22] The NAD was initially established in an attempt to provide labour for the gold mines, which would have ensured production and ultimately attracted much-needed capital for Milner's reconstruction of the Rand. However, in practice the NAD "was not the blunt instrument of the captains of industry", but rather kept the balance "between African and white [and served] to secure cohesion within the wider social fabric".[23] The NAD was in a sense caught in the middle as it was on the one hand a state structure and

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[19]COMAR (1900 & 1901) 145.

[20]Packard, White Plague 33.

[21]Marks, S., & Anderson, N., "Diseases of Apartheid," in Lonsdale, J., (ed) South Africa in Question (London: James Currey, 1988) 177.

[22]Yudelman 59-60.

[23]Dubow, S., Racial Segregation and the Origins of Apartheid in South Africa, 1919-1936 (Oxford: Macmillan, 1989) 12.

thus answerable to the government of the day, while on the other hand it was meant to act as protector of African South Africans.[24] Nevertheless, the first Director of NAD, Sir Godfrey Lagden, worked openly with industrialists, permitting "Rand financiers, and leaders of the Chamber of Mines, to study and comment on virtually all of his draft legislation and memoranda for Milner".[25]

Accountable to the NAD were labour inspectors whose task it was to inspect the places of work and the accommodation of African workers. Nevertheless there was considerable confusion over what exactly an inspector did, especially as the inspectors' tasks often overlapped with those of the Medical Officer of Health (MOH) for Johannesburg. The NAD inspectors examined the miners' diet, medical matters and compound conditions. Inspectors from the Department of Mines examined the safety aspects. The MOH for Johannesburg also examined hygiene matters, which included sanitation, and general compound issues. The passing of the 1911 Native Labour Regulation Act (see next section) considerably strengthened the powers of the labour inspectors. Yet considerable problems remained for the NAD's inspectors, not least the lack of available person power for the inspections. In most years there seems to have been only one inspector, who had to inspect up to 94 mines a year, often more than once during the year. The inspections must therefore have normally been extremely cursory if one bears in mind that transport moved considerably more slowly in the first decade of this century than it would today.[26]

1910-1922

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[24]There is a huge literature on British colonial policy, especially with regard to "native relations". Britain's policy of "indirect rule" emphasised that while Africans were to provide taxes and labour they were paradoxically also meant to be protected by the British in Africa. An excellent study of this policy is A. G. Hopkins's forthcoming book on British Imperialism (Topics from the book were presented in a series of seminars at Rhodes University, Grahamstown, April 1991).

[25]Burton, D.R., "Sir Godfrey Lagden: Colonial Administrator," Ph.D thesis, Rhodes University, (1991) 272.

[26]David Duncan has argued that white miners knew when an inspection was coming and therefore ensured that the inspectors seldom observed the mine working normally ("The Regulation of Working Conditions for Africans, 1918-1948," paper presented at the History Workshop Conference, University of the Witwatersrand, February 1990). The effectiveness of the inspectors and the content of their inspection reports will be scrutinised further in chapters two to six.

Terreblanche and Nattrass have described this period as being "characterized by the economic and political dominance of the English establishment and the structuring of a racially segregated society".[27] This was the period when South Africa became a Union and Africans were practically excluded from parliament. It was also a period in which the large mining houses strengthened their grip on the economy, financially through the Chamber of Mines and politically through the South African Party.[28] Moreover, this period also saw the only significant conflict between state and mining industry prior to World War Two. That was the banning of the recruitment of miners from North of 22° South in 1913 (see chapter five).

At Union in 1910, which brought the four colonies and ex-republics together, no attempt was made "to unify the varied health services and measures in the region...the statutes of the old colonies became the statutes of the respective provinces".[29] In other words, the provinces were made responsible for the establishment, maintenance and management of hospitals and similar institutions while local government continued to contribute financially to hospital budgets. In actual fact most hospitals relied on fee-paying patients and generous benefactors for most of their income as government failed to provide sufficient subsidy.[30] This half-hearted attempt to improve the national health system partly explains why the government's response to health matters remained on a largely ad-hoc basis. Epidemics and fear of contagion appear to have been the motivating factors for action on the health front. Hence in 1914, for example, the increasing incidence of TB led the government to establish a TB commission to examine TB prevalence.

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[27]Terreblanche et al. 7.

[28]It should be borne in mind that throughout the period under discussion the mining houses dominated finance capital. A large proportion of this capital, 60 %, came from overseas investors. Between 1911 and 1933 gold represented 60 % of South Africa's total export earnings (for details see Nattrass, J., The South African Economy: Its Growth and Change [Cape Town: Oxford University Press, 1981] 144).

[29]Marks et al. "The Diseases of Apartheid," 192.

[30]For more information on hospital structures and how they were financed see the Report of the Committee of Inquiry re Public Hospitals and Kindred Institutions (Vos Commission), UG30-1925.

The outbreak of the Spanish Influenza epidemic is another good example of state action motivated by fear of contagion. The death of about 250 000 South Africans prompted the government to pass the 1919 Public Health Act, which led to the establishment of a Department of Health in South Africa.[31] However, the passing of the Act changed little as the three-tiered system remained. Three different authorities continued to be responsible for the provision of health services, namely, [1] the local authorities, who were responsible for health locally (sanitation and controlling outbreaks of infectious diseases, in the Cape they were also partially responsible for financing general hospitals); [2] Provincial councils, responsible for the control of hospitals; and [3] the Department of Public Health, "endowed with powers to advise, assist, and if necessary, coerce the local authorities and provincial administrations in regard to their public health duties, and with authority to undertake certain duties on its own accord".[32] The only legislation that dealt with environmental conditions was the 1920 Housing Act, which was gravely inadequate.[33] Therefore, it was the state that financed the treatment of patients with contagious diseases "not so much for the sake of the sufferer as to prevent the spread of the disease". For less contagious illnesses the therapy was the patient's financial responsibility.[34] Thus the Act made no provision for the building of hospitals other than for accommodating people with sexually transmitted diseases, TB and mental disorders. The Act thereby empowered the health department to ensure the "prevention, limitation or suppression of infectious, communicable or preventable diseases within the Union".[35] A further reason for the establishment of a Department of Public Health was to collect health data, vital for planning health policies. Yet more than 20 years later the Gluckman Commission lamented that "totally lacking are statistics in connection with the general health of the community

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[31]For a comprehensive discussion of the epidemic see Phillips "Black October". This epidemic was significant, because it "knew no colour bar". Segregation was of little help as a preventative measure as all South Africans were at risk. Furthermore, the epidemic brought into sharp focus the fact that South Africa had no health system (Phillips 229-236).

[32]UG30-1944 11. In South Africa today things have got even more absurd: there are now thirteen different departments of health and welfare!

[33]For a full discussion of this Act and its consequences see Packard, White Plague, especially chapter 5 (126-158). Not only did the Act fail to address the housing shortages by building too few houses but it also made no provision for housing loans for Africans so that they could afford to build their own.

[34]UG30-1944 21.

[35]Act no. 36, The Public Health Act, 1919.

according to age groups, occupation, geographical regions...Little is known in connection with nutritional indices of the people". What compounded these inadequacies was that "in rural areas, however, the death of a non-European need not be registered and ample evidence was tendered that this fact has made impossible any scientific assessment of the incidence of disease in this country".[36] It will be noticed in later chapters how the absence of certain statistics has created particular problems when examining mortality and morbidity rates for miners. The most significant problem is that it is very difficult to compare statistics for miners and the wider community as figures for the latter are very scarce.

Like the Health Act much of the legislation that was passed in this period also had a direct impact on the industry. The two crucial acts were the 1911 Mines and Works Act, and the 1911 Native Labour Regulation Act. The former laid the basis for the colour bar and the latter provided a framework for labour contracts. The acts were both relatively vague, and thus the government departments concerned had to shape separate regulations to ensure the practical use of the Acts. The Department of Mines, for example, established a system of inspectors to ensure that the Mines and Works Act was being implemented. Furthermore, it had to define the duties of mine managers and overseers, as well as implement a safety system on the mines.[37]

On the home front migrants were being placed under increasing pressure as a result of the 1913 Land Act. As is well known, the 1913 Land Act and subsequent land legislation played a significant role in the collapse of African rural agriculture. For example, the Ciskei, a reserve, was described by R.W. Norton in the late 1940s as follows:

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[36]UG30-1944 85.

[37]The Department of Mines was made up of three sub-divisions. One section dealt with prospecting, a second with geological surveys, and the third with engineering. The third branch is the most important, as far as this thesis is concerned, as it was headed by the Government Mining Engineer (GME). Under him fell the mine inspectors who were concerned with the safety of miners, and who inspected and reported on accidents. Inspectors were also required to examine technical aspects of the mining, which sometimes brought them into conflict with the safety aspects of their work. Sir Robert Kotze (1906-1926) and Dr Hans Pirow (1926-1937) were the GMEs in this period. Both were political appointments. Kotze chaired the 1920 Low Grade Mines Commission, whilst Pirow played a significant role in the 1930 Low Grade Ore Commission. On retiring from civil service, Kotze became a Director for De Beers and Pirow became a consultant for the Corner House.

> Over perhaps 10 per cent of the total area, the incidence of soil erosion may be described as slight; over 50 per cent as bad; over the balance, as nothing less than terrifying...What goes on in the Reserves? Nearly one-third of all families have no arable land.[38]

Deterioration of the Transkei's and Ciskei's natural resources resulted in a number of outbreaks of disease in these two areas. Rev. J. Dexter Taylor, a missionary, declared that "typhus and enteric fevers are both endemic in the Native territories, breaking out into epidemics here and there. Dysentery is met with every hot season, sometimes in epidemics".[39] Typhus, for example, was rampant in the period 1917-1923. Commonly associated with poverty, filth and overcrowding, the disease is usually borne by lice, rats, ticks and mice. Rather than attack the problem at its root, officials established a cordon around the infected areas. People travelling out of the infected areas were dipped and deloused before they could continue their journeys. The enforcement of the delousing campaign led to a conflict within the state. On the one hand the NAD had to field the complaints of irate African passengers who were being treated like cattle, and on the other hand other government departments had to placate white voters concerned at being infected.[40]

Economically, while it was a period of some physical growth for the mining industry, it was also a period of decreasing profit on the world market as Europe was struggling to reorganise its share of the world economy after World War One. As a result of this crisis, the mining industry attempted to alleviate its position by decreasing the wages paid to African labourers. However this did not provide a solution and the industry remained in crisis.[41] The president of the Chamber of Mines estimated that if

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[38]R.W. Norton quoted in the Report of the Native Laws Commission, UG28-1948 15.

[39]Taylor, J.D., (ed) Christianity and the Natives of South Africa (Alice: Lovedale Institution Press, 1928) 22.

[40]A disinfection station was established at Sterkstroom, a station on the main railway line to the Witwatersrand. Black miners were also treated (dipped) at the WNLA compound in Johannesburg. Incidently, all personal belongings were dipped as well. For the details see Marks et al. "Typhus and Social Control," 270-275.

[41]Whilst the reasons for this are complex one can nevertheless point to a number of important factors. During the war gold had ceased to be the basis of the currency in a number of countries "and that, owing to the creation of large quantities of paper money, the currency became inflated and depreciated in value in relation to the gold". For more details see Report of the Low Grade Mines Commission, UG34-1920 11-14, and Drummond, I.M., The Gold Standard and the International Monetary System, 1900-1939 (London:

the gold price was to remain at the 1919 price level somewhere between 16 and 31 mines would end up working at a loss. If these mines were to close an estimated 88 000 African miners would have lost their jobs and about 12 000 white miners would also have been retrenched. Furthermore the state would have lost about £1 800 000 of revenue per annum.[42] The industry's ensuing anxiety forced the state into appointing a commission of enquiry (Low Grade Mines Commission) to investigate the plight of the gold mines. White trade unionists who presented evidence to the commission prophetically warned that if retrenchments were to occur there would be problems as "starving men are not given to be reasonable and a tendency to disturbances would almost inevitably assert itself".[43] While the commission rejected the industry's proposal that the state should subsidise the mines to alleviate their problems, the commission did agree with the industry on the removal of the colour bar and subsequently recommended this.[44] It was this action of replacing some white miners with cheaper African miners that played a significant role in the white miners' strike of 1922.[45] The commission also recommended lifting the 1913 ban on recruiting miners from North of 22° South, which the government refused to do.[46]

Macmillan, 1987).

[42]In 1915 working costs averaged 17s.5d. per ton for the first half of 1915; by the 4th quarter of 1919 they averaged 23s.9d. The major reason for this was the increase in white miners' salaries and the cost of stores (UG34-1920 7-8).

[43]Cited in UG34-1920 15. An indication of the increase in costs can be seen in the following example - candles, used as a source of light underground, increased from 4.50d per pound in 1914 to 11.58d per pound in 1921 (Report of the Mining Industry Board, UG39-1922 14).

[44]Citing the reports from a myriad of earlier commissions that had, whilst investigating a wide range of issues, examined the colour bar question the commissioners recommended that "while not agreeing entirely with the reasoning advanced by our predecessors in this enquiry, we are of the opinion that the legal restriction now in force should be abolished" (UG34-1920 29). This recommendation was not agreed unanimously by the commission, the three commissioners representing the interests of white miners voted against. African miners were not represented on the commission (the colour bar is discussed in chapter two).

[45]Space prevents much discussion of this strike. For more details it is suggested that one consult the work of O'Meara and Yudelman, amongst others.

[46]Reasons for the government's reluctance to lift the ban include the high mortality rate on the mines and the fact that the authorities in the recruiting areas were unwilling to release labour for the Witwatersrand. For the details see Paton, B., "Labour Export Policy in the Development of Southern Africa," PhD thesis, Institute of Social Studies, The Hague (1990) 36-37.

Union had also meant that the three provincial Native Affairs departments united to become one.[47] Nevertheless its status remained "weak and poor, managing to attract only a tiny fraction of the state's total expenditure".[48] Its main area of strength was the Transkei and the Witwatersrand, but only in the former was its policy consistent and effective. The NAD's ineffectiveness was further exacerbated by enforced cutbacks in staff numbers by about 30% after the 1922-3 Public Service Commission recommended austerity as a result of economic depression.[49] A major problem for the NAD was that it lacked an effective departmental head and that it fell under either the Prime Minister or his deputy, neither of whom had much time for the department. Of some significance to the NAD's evolution was the type of person drawn to work in the department. At first, according to Saul Dubow, many of the NAD's administrators, throughout the Union, "were the sons of missionaries...[while] others had pursued military careers before joining the civil service".[50] Probably many were Oxbridge graduates. Later, as the NAD evolved further, and as the result of Union, the NAD's personnel were drawn more and more from local high school matriculants.[51] Despite this local flavour few of the personnel of the NAD appear to have been Afrikaans, with the majority of the correspondence conducted in English well

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[47]It is interesting to note that while the health departments had not unified at union the NAD had. A possible reason might be that the government perceived labour issues as more important than health issues at this point in South Africa's history.

[48]Dubow 77.

[49]See Dubow (82-86) for the details.

[50]Dubow 80.

[51]John Lonsdale, personal communication, 1990. Space does not permit one to explore the idea of distinguishing between the Oxbridge type and the matriculant, nor can one address the question of why bureaucrats act the way they do. Someone who has begun to do this, in relation to the South African state in the period under discussion, is David Duncan. Utilising Max Weber's analysis of large bureaucratic organisations, Duncan discusses the four "p's" -"Procedure, power, prestige and principles...Under procedure, one must consider the ritualistic over-emphasis on rules, the adherence to codes of regulations which could take on a significance of their own in the minds of officials...Second, officials concerned with their own career advancement and with the wider reputation of their branch of the civil service were often preoccupied with departmental power and prestige...while the ultimate bogey was that of professional embarrassment. The idea that some officials were moved by principles or morals is more difficult; but a residual sense of 'trusteeship '- of duty to protect the African from the adverse effects of contact with the white man - was still a part of the administrative psyche, at least in the NAD" (3).

into the 1930s. Furthermore, until 1934, all the departmental heads had served either in the Cape or the Transkei.[52]

1922-1933

This period was characterized by the mining industry's losing some political power to the Afrikaner nationalists as well as having to make some concessions to white miners. The declining gold price, coupled to increasing production costs, led the industry to attempt to replace white miners with cheaper African miners.[53] The ensuing strike and subsequent revolt ultimately led to the 1924 election victory for the alliance between the English-speaking Labour Party and the Afrikaans-speaking National Party under Hertzog. Terreblanche and Nattrass argue that this led to a shift in the economic philosophy of the government "from economic liberalism (in all affairs other than labour) to economic nationalism in the form of increased state intervention and protective external policies".[54] Import substitution became an important principle in the government's economic policy. This policy stimulated the nascent manufacturing industry which in turn created some labour recruiting problems for the mining industry. The entrenchment of the colour bar in the 1926 Mines and Works Act was seen as a significant blow to the mining industry, especially as its enactment contributed to the industry's losing vital foreign investment.[55] Mining interests were not ignored though. Acts such as the 1923 Urban Areas Act ensured that many African miners did not bring their families to the Witwatersrand.[56] Wages were

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[52]Dubow 80.

[53]The gold price dropped from 130s. per fine ounce in February 1920 to 95s. per fine ounce by December 1921 (Wilson 10).

[54]Terreblanche et al. 9.

[55]Apparently the Chamber "financed the campaign against the 1926 amendment, the first well-financed campaign against segregation measures since 1910" (for the details see Lipton, 113-115).

[56]Other acts that also made an impact on the mining industry were Act No.11, The Industrial Conciliation Act, 1924, which allowed for white miners to organise themselves into Trade Unions. Black Trade Unions were made illegal. Act No.27, The Wage Act, 1925, established a wage board to determine wages and conditions of work.

pegged at a level that only supported a single person, a further deterrent to bringing one's family to the urban areas.[57]

Dubow has approached this period slightly differently, arguing, in response to the "cheap labour thesis",

> that segregation should be seen as a generalised response on the part of the state to the problems wrought by industrialisation; specifically, it was intended to cope with ecological and social collapse of the reserves, and the political threat posed by an uncontrolled and potentially uncontrollable African proletariat in the cities.[58]

In other words, segregation was not primarily concerned with ensuring cheap labour for either the mines or for agriculture. The NAD, according to Dubow, in the 1920s "lacked any dynamic sense of direction: its policies were essentially reactive; its strategy overwhelmingly dominated by the prerogative to contain, deflect and defuse conflict".[59] Ironically it was the cutbacks that it had suffered as well as Hertzog's segregationist policies that ultimately led to a much stronger NAD developing at the end of the 1920s. A major reason for the NAD's revival was that the Public Services Commission reversed its earlier decision and recommended that the department be allowed to recruit more staff. The NAD's struggle to regain its overall control of "native affairs" led it into sharp conflict with other government departments.[60] Dubow argues further that the NAD underwent a notable shift in policy during the 1920s. The NAD's doctrine of "sympathetic paternalism" was replaced with "a more corporate or communal style with a harder bureaucratic coin".[61] By the 1920s and 1930s, the policies of segregation were influencing the NAD as it

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[57]However, "whether the advantages of a repressed migratory black working class made up for the cost disadvantages of a protected white working class (as the neo-Marxist analysis implicitly maintains) is a moot point. However, if white workers had not managed to turn economic defeat in the labour market into political success at the polls, it is doubtful whether South Africa's white labour aristocracy would have remained as tenaciously entrenched. If mining capital could have had its way, the power of white labour would have been broken, job reservation scrapped, and the black migrant system maintained" (Terreblanche et al. 10).

[58]Dubow 52. See also pages 53-56 in Dubow for a full account of why he rejects the "cheap-labour thesis".

[59]Dubow 87.

[60]For more details see Dubow (87-93). It was this conflict within the state that, according to Dubow, had an important impact on the development of segregation in South Africa.

[61]Dubow 108.

> constantly sought to reconcile its "protective" role with its manifestly coercive functions. But this proved to be a balancing act which the Department found increasingly difficult to sustain as the realities of segregation became apparent. The ideology of benevolent paternalism had developed out of early forms of colonial domination and it flourished where relations of domination were mediated by personal contact between rulers and ruled. But these governmental forms were steadily undermined as capitalist relations eroded existing social boundaries and encouraged the formation of political constituencies with an explicit class content.[62]

A further strand of the policy of segregation that emerged in the corridors of power was the

> pseudo-scientific doctrines of social Darwinism and eugenics...It was these theories which lay behind the concern to preserve "racial purity", the common speculation about the innate intelligence of different races, an unquestioning acceptance of the "evils" of miscegenation, and a highly charged fear about the "degeneration" of both African and white races in the industrial context.[63]

It was these doctrines that contributed, not insignificantly, to the creation and enactment of the 1927 Native Administration Act, seen by Marion Lacey as "the first link in a chain of measures leading to the refurbishment of African traditionalism, with the emphasis on ethnic cultural separatism". This gave the NAD greater control in the Reserves to uphold "tribal" structures. According to Lacey "[the] NAD could do practically what they liked in the name of the Supreme Chief without being answerable to Parliament or the law...Lacking resources and bent on control, they refurbished the tribal system as a way to run their own empire. This they did regardless of tribal realities or what Africans themselves wanted".[64]

The impact of such legislation on both rural and urban African groups was devastating. Not only were landholdings inadequate, which led to malnutrition and other forms of illness associated with poverty, but so too was the medical care in the reserves. In the rural areas few hospitals were to be found, and

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[62]Dubow 12.

[63]Dubow 7.

[64]Lacey, M., Working for Boroko (Johannesburg: Ravan Press, 1981) 85 & 99-100. In the rural areas the NAD, after 1932, were aided by the Native Service Contract Act (1932) described by Lacey as "the harshest anti-squatting law yet" as it restricted all blacks in the rural areas to a "period of between three and six months compulsory service to farmers". During this period a similar attack on squatters occurred in other settler colonies in Africa, Kenya being probably the best example of such attacks (for details see Furedi, F., The Mau Mau War in Perspective [London: James Currey, 1989]).

all of them were mission hospitals.[65] The absence of any real medical care in these areas prompted the health department, in 1928, to recommend strongly that African doctors be trained in South Africa specifically so as to provide some form of health care in the rural areas. In making this recommendation the department was not illustrating its progressive nature, but was demonstrating its concern that the health crisis in the rural areas held a

> two-fold menace to the community...Firstly, there is the immediate danger of the spread of infectious and contagious diseases from areas where they may be said to be practically endemic. Secondly, there is the economic danger of the deterioration and eventual failure of the labour supply, which is already forming the subject of special inquiry in Kenya and the Congo.[66]

In the rural areas a ratio of only one qualified medical doctor per 40 000 people was not uncommon. Most African South Africans who became ill still tended to consult a traditional healer. In the 1920s it was estimated that there were 4 000 such healers in the whole of South Africa, of whom 1 250 were licensed by the government to practise.[67]

Health conditions in the rural areas may have been bad but they were not significantly better in the urban areas. A 1927 survey of hospitals in South Africa noted that "the evidence given at almost all the large centres of population in the Union was to the effect that patients urgently in need of hospital treatment were being constantly refused admission, and that members of the committee had seen for

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[65]UG30-1944 63. The Gluckman Commission found that mission hospitals were overflowing with patients as Africans became more "hospital minded". No mention was made of the socio-economic crises in the reserves in the 1930s which undoubtedly contributed to the ill health of the people in these areas.

[66]Report of the Committee Appointed to Inquire into the Training of Natives in Medicine and Public Health, UG35-1928 5.

[67]UG35-1928 5. In the late 1920s and 1930s there was considerable debate over how to give rural blacks proper medical care. On the one hand some were of the opinion that blacks should be allowed to train as doctors. On the other hand there was considerable reluctance, especially by the medical schools, to train blacks as doctors. As an alternative the latter proposed that medical aides should be trained instead. The training period for aides was to be significantly shorter than that required for studying to become a doctor. The medical aides scheme was implemented in the late 1930s at Fort Hare, but had folded by 1941 as the University of Cape Town and the University of the Witwatersrand finally allowed black medical students to study medicine. The course had also been plagued by staff shortages. The first teacher on the course, Dr G.W. Gale, resigned soon after beginning the course as it was only "offering a pseudo-medical qualification" (cited in Shapiro 252). For a full account of this debate see Shapiro, K., "Doctors or Medical Aides - The Debate over the Training of Black Medical Personnel for the Rural Black Population in the 1920s and 1930s," JSAS, 13 (January 1987) 234-255.

themselves the overcrowded and disgraceful state of many of the public hospitals...accommodation at most public hospitals was utterly inadequate, particularly in regard to provision for the coloured and native races".[68] Nevertheless the committee was convinced that a differential treatment of African patients was desirable. Hence the members of the committee deemed it necessary that in the provision of hospitals about 200 whites per hospital bed was fitting whilst for "raw natives" a ratio of 700 per bed was acceptable. In reality the figure in the Orange Free State, the Union's most ill-equipped province to handle Africans who were ill, stood at 7 603 Africans per hospital bed.[69] In large measure, this demonstrated reluctance to build hospitals was quite simply the government's lack of enthusiasm for bearing the brunt of the financial costs of health care. As was noted earlier, the Public Health Act had made no provision for the building of hospitals other than for accommodating people with sexually transmitted diseases, TB and mental disorders. In 1925 the Vos commission of inquiry into public hospitals declared that the

> multiplicity of authorities dealing with diseases has resulted in a state of chaos. What little has been done recently in the matter of providing special accommodation for infectious diseases was largely due to the public conscience being stirred by the outbreak of influenza in 1918, but the question had not been dealt with as it should be, nor does it appear to your committee that anything can be done satisfactorily until one authority is responsible for dealing with all diseases.[70]

In 1944 Gluckman deplored the complete absence of any national hospital authority, despite the "strong 19 year old recommendation of the Vos Report that there should be one".[71]

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[68]Report on the Hospital Facilities and Kindred Services in the Union of South Africa, UG25-1927 1. The report, preoccupied with patient to bed ratios, found that in most cases South Africa fell very short of desirable hospital accommodation. It should be pointed out that, while accepting that there was a terrible shortage of adequate medical care for the majority of South Africa's people, that patient to bed ratios are only useful when comparisons are contextualised. During an epidemic, for example, a greater number of beds will be needed than when there is no epidemic.

[69]UG25-1927 7. The figure for whites in the OFS was 846 per hospital bed. The best case was in Natal 160 whites per bed and 1469 blacks per bed. These figures apparently excluded blacks living in reserves. On the mines the ratio was about one hospital bed per 40 miners.

[70]UG30-1925 35.

[71]UG30-1944 99.

The collapse of the Wall Street stock exchange and the ensuing Great Depression, both of which have been well documented, magnified the contradictions inherent in South African society at this time, and nowhere more so than in the mining industry. With the world's economy perilously close to collapse discussions on health expenditure were pushed off the agenda. South Africa did not escape this economic crisis. Gold, as a product traded on the world market, lost some value as a result of this downturn in the world economy. Mining industrialists feared a repeat of the 1919 crisis or even worse, and therefore again called on the government to provide aid for the industry. In response the government appointed the 1930 Low Grade Ore Commission, to investigate the crisis and to recommend ways to prevent the industry's collapse. Like its predecessor in 1919, the 1930 commission was faced with the possible closure of several mines which in turn would have meant a loss of jobs and revenue for the country as a whole. Yudelman, however, correctly points out that the commission grew out of both a genuine economic problem as well as a political concept. The concept of low grade mines was "developed into a symbol by mining capital to mobilize public support for its cost cutting campaign".[72] The commission devoted much of its time to discovering ways of ensuring a "permanently adequate supply" of African labour for the mines.[73] Recommendations by the commission thus dealt largely with methods of recruiting. The most significant of these was the endorsement of the industry's desire to re-recruit tropicals, in other words, to lift the ban on their being recruited. The story that unfolded from this recommendation will be told in chapter five.

1933-1939

This, the final period covered in the thesis, was characterized by the recovery of the gold price, a recovery sparked by South Africa's abandonment of the Gold Standard in 1932. This upturn in the gold industry also saw a general recovery in the economy in South Africa, which, during this period, grew at five per cent per annum.[74] A major factor in this growth was the expanding manufacturing industry.

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[72]Yudelman 136.

[73]Report of the Low Grade Ore Commission, UG16-1932 11. For details of the whole low grade ore question see pages 17-21 of the report.

[74]Terrreblanche et al. 10.

As in Zimbabwe, the manufacturing industry's growth was stimulated by the mining industry. In 1919 manufacturing industries' output was £87 945 000, employing 119 767 people. By 1936 it was employing 218 966 people and its output was £171 469 000.[75] Similarly in agriculture, mining contributed significantly to expansion.[76] White agriculture was thus, thanks in part to mining taxes, given a shot in the arm (£112 500 000) during this period while African agriculturalists were excluded from the fruits of economic recovery. Furthermore, "African farmers had no access to the Land Bank and scant chance of borrowing from any other bank. No infrastructure existed for African farmers - transport and marketing facilities were largely inaccessible as were other areas of agricultural services".[77] Environmental disasters in the African rural areas compounded matters such as the drought, for example, that lasted, in some areas, for as long as seven years from 1927 to 1934. Plagues of locusts and bouts of crop diseases were further examples of the disasters that beset African rural areas.[78] The agricultural and hence economic collapse of the reserves prompted many of their residents to flee and seek work in the urban areas. The steady flow of people soon flooded the existing accommodation in the towns and cities. The situation was accentuated by the inability of the authorities to agree on who should foot the bill for new housing, as neither the central government nor local government was prepared to fund the necessary housing. While regional differences prevailed in how local authorities eventually dealt with the crisis, one can say that throughout the 1930s and beyond the difference between the number of people who wanted houses and the number of houses built never came close to zero.

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[75]Nattrass 165.

[76]Between 1911 and 1936 the SA government raised £148 million in taxes from the mining industry and spent £112 million on agriculture in the same period (Lipton 260). Agricultural production passed the £200 million mark for the first time in 1941, but it was not all plain sailing. Agriculture was badly hit by fluctuating world market prices in the 1920s (Hobart Houghton et al. 3: 45-51). Ironically the 1930s, which was the period of agricultural recovery, was also the period in which malnutrition was on the increase in the reserves (see chapter four).

[77]Lipton 104-105.

[78]Packard has argued that a key component in the African farmers' inability to survive was the 1936 Maize Marketing Act. This Act, like the similar one that was passed in Zimbabwe in the 1930s, offered two prices for Maize to farmers. White farmers were offered the higher of the two, whilst African farmers were offered only the lower price. African farmers were thus subsidising white farmers because the state ploughed back the profits into agricultural aid schemes for white farmers - schemes which Black farmers seldom saw, never mind participated in (White Plague 116).

The Gold Standard issue had also created a political crisis for South Africa which was resolved in the short term by the coalition between Hertzog and Smuts. The Fusion government, as the coalition came to be called, has been seen by a number of historians as an alliance of two men with different hidden agendas. Although they both wanted to solve the economic crisis, they had strongly divergent views on constitutional matters. Terreblanche and Nattrass have noted that "Hertzog's hidden agenda was to gain support for the removal of Africans from the common voters' roll in the Cape and Natal. Smuts's hidden agenda was to stop Hertzog from increasing taxation on the now highly profitable gold mines."[79] Both objectives were achieved. Although the government did raise taxes they were not crippling, which allowed the industry to open a whole new gold field (the West Wits line), as well as to undertake further developments on existing mines. Yudelman has argued that the modern South African state that arose not only consisted of a buoyant gold mining industry but was now also made up of a growing commercial agricultural sector and a nascent manufacturing industry. The latter two sectors, according to Yudelman, had the mining industry to thank for their development because since Union the state had regarded the mining industry as "both a wasting resource and the milch cow of the economy", and treated the industry as such whenever possible.[80] In the area of constitutional change Hertzog was successful in disenfranchising black South Africans. However, not only did African voters lose the right to vote but further inroads were made into their right to own property. The latter was a result of the 1936 Native Trust and Land Act.

Importantly for the gold mining industry, Fusion let the "English establishment regain political and economic hegemony".[81] It was this access of pro-imperial forces to political power, after the collapse of Fusion, that saw considerable shifts in both the mining industry and in other sectors of the economy towards the outbreak of World War Two. Foremost amongst these shifts was the transformation of the South African economy into a "war economy". In practice this saw the abandonment, albeit temporarily, of the strict enforcement of repressive segregation legislation (especially the colour bar and

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[79]Terreblanche et al. 10.

[80]Yudelman 259.

[81]Terreblanche et al. 10.

the Urban Areas Act). World War Two also saw an increase, although small, of wages in industry, especially in the nascent coal mining industry and, to some extent, the railways, which attracted labour from the labour pool and thus created labour shortages for the mines.

Whilst the thirties certainly saw a significant improvement in sections of South Africa's economy the same did not happen for the health of its people. The establishment of the Department of Health had heralded the birth of a system of public health, albeit seriously inadequate, for urban whites; it held no such advantages for the majority of the African population who were living in the rural areas.[82] A committee established in 1933 to examine the disparity between urban health facilities for whites and the African population found that there was, as mentioned earlier, still only about one doctor per 30 000 African patients in the rural areas. Those doctors who worked in the country were usually either attached to mission stations or were part-time state appointments, in other words district-surgeons. A "mere sprinkling of doctors eked out an existence in private practice" in the rural areas.[83] The Transkei, for example, only received its first full-time MOH in 1938. Prior to that, in the years 1929 to 1931, a part-time official had been based in King Williams Town, who was responsible for both the Transkei and the Ciskei.[84] Marks and Anderson have noted that it was only in the late 1930s that medical men and Department of Health officials, outside of the mining industry, were "beginning to be aware of deteriorating conditions in the rural areas and the appalling social conditions in the towns". These enlightened few doctors were only able "to influence public health policy during the short-lived period of reformism during and immediately after World War Two".[85] The mining industry's medical men, as will be shown in several later chapters, were well aware of the deterioration of rural conditions

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[82]It should be noted that blacks were not the only people being neglected by the Department of Health. The 1930 Carnegie Commission found that thousands of "poor" whites were not receiving health care either and they also had high maternal and infant mortality rates. Space does not permit much discussion on this topic, especially as much has been written on "poor" whites already. Suffice it say that health services were eventually extended to this group whereas for most rural blacks this basic right has yet to be given to them.

[83]Report of Public Health Department, UG40-1934 81.

[84]Report of Public Health Department, UG49-1938 85.

[85]Marks, S., & Anderson, N., "Issues in the Political Economy of Health in Southern Africa," JSAS, 13 (January 1987): 29.

because they were exposed on a daily basis to the products, migrant labourers, of these conditions. In fact much of the health care that could be found in the rural areas was sponsored by the Chamber of Mines, which by 1935

> was giving nearly £85 000 to the Union and protectorate governments for the establishment of medical and hospital services in African areas (funded it should be noted out of the interest of the deferred pay of African workers). As W. Gemmill, General Manager of the Gold Producers' Committee of the Chamber of Mines delicately put it: "This payment is, in effect, a recruiting charge in as much as it is made with the object of promoting the welfare of the Natives in South Africa so that there shall be an ample supply of Native labour for the mines".[86]

However, as conditions worsened, public hospitals overflowed and industry became increasingly agitated with the spiralling cost of the ill-health of its workforce. Considerable pressure was brought to bear on the government to do something about the situation. In 1942 the government responded by appointing yet another commission of inquiry.

Between 1942 and 1944, under the chairmanship of Lieutenant-Colonel Gluckman, the National Health Services Commission met to review South Africa's medical system and to propose a plan for a national health service. The detailed report presented by the commission highlighted the failings of government in not creating any form of health policy. Gluckman noted that even after the 1918 influenza epidemic, which highlighted the inadequate health services in the country, the government could not devise a "national health authority with powers to deal with every aspect of national health and medical services. The control of general hospitals was left in the hands of four national authorities without any mechanism for coordination at the national level: and such important matters as maternity and child health and dental services were not mentioned".[87] Whilst the commission made it abundantly clear that by the onset of World War Two South Africa's public health services were in a chaotic state and required urgent attention it did not see this as the final solution, because "reforms in the public health

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[86]Marks, S., "The Historical Origins of National Health Services," Keynote Address to the 1987 NAMDA Annual Conference, Proceedings of the 1987 NAMDA Annual Conference (Cape Town: NAMDA Publications, 1988) 5-6.

[87]UG30-1944 2. For an interesting historical overview of South Africa's health facilities see pages 2-5 of this report.

and medical services will probably bring about very little improvements in the nation's health, unless accompanied by drastic reforms in other spheres as well".[88]

Conclusion

Marks and Anderson have noted how the

> industrial and agrarian revolution which followed the development of the mining industry, the new concentration of population on the mines and in rapidly developing towns and the social hazards of the mining, together with increasing impoverishment in the countryside, were to have swift and devastating implications for the physical well-being of workers, both African and white.[89]

This chapter has attempted to explain the background to the health crises that occurred on the mines in the period between the South African War and the Second World War. Thus the collapse of the rural reserves, whence much of the mine labour was drawn; the passing of repressive legislation, which prevented African workers from challenging their social, political and economic deprivation; and the inadequate attempts by the state to install a health system, have all been shown to have had considerable impact on the mining industry. The following chapters will examine what devastating implications this had for the African miners, and examine also the health and safety system that was created on the mines in response to the crises.

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[88]UG30-1944 97.

[89]Marks et al. "Issues in Health" 178.

Chapter Two

"They come on foot": Recruitment, Transport, Work and Wages on the Witwatersrand Gold Mines

> They come on foot, on horseback, on bicycles, by dug-out canoe, by lake and river steamers, in lorries , by train and some even by air. They come from as far afield as 2000 miles. They come from all points of the compass - from peaceful hills of the Transkei, from the lion country of Bechuanaland bush, down the broad reaches of the Zambesi, from the tropical showers of Lake Nyasa and the mountain fortress of Basutoland. They come, too, in their thousands from the hills and valleys of Portuguese East Africa, from the rocky uplands of Sekukuniland, the tangled swamp country of the Okavango delta and the green fields of Swaziland. From these four corners of southern Africa men from more than 100 different tribes are attracted every year to the Witwatersrand by the magnet of the mining industry.[1]

> For all the importance of the labour question throughout the period of European intervention in Africa, and for all its acuity since the 1930s, work is one of the least examined aspects of African history, even of African labour history. Rarely have scholars asked what people do when they work, why they do it, and how workers and managers alike try to shape the pace, intensity, and generality of what gets done....what gets Africans into workplaces has received more attention than what they do in them.[2]

To understand African miners' living and work conditions on the Witwatersrand gold mines it is necessary to discuss not only the type of work the miners did but also, as prelude, the recruitment system and the means by which miners travelled to the mines.

Recruitment

Much has been written on how miners were recruited for the mines and why the mining industry went to such great lengths to recruit labour. Arguably the most significant contribution on this topic is the work done by Alan Jeeves. His Migrant Labour in South Africa's Mining Economy: The Struggle for the Gold Mines' Labour Supply, 1890-1920 successfully examines why the industry required so much physical labour. Furthermore, he has also noted how, as the mines were transformed from open cast

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[1]Quote taken from Mining Survey (Johannesburg: Chamber of Mines, June 1951), cited in Hobart Houghton et al. 3: 89-90. Although this quotation refers to the situation in 1951, all the territories mentioned had been supplying labour for the gold mines since before the turn of the century.

[2]Cooper, F., On the African Waterfront: Urban Disorder and Transformation of Work in Colonial Mombassa (New Haven: Yale University Press, 1987) 5-6.

mines to deep level ones, the labour needs of the mining industry increased. Finally, the book also sheds light on how the recruiting system worked.[3]

Jeeves explodes the myth that industry and state worked hand in hand to force indigenous groups to work on the mines. Rather he shows that the evolution of the recruiting system was extremely complex with many regional variations.[4] Furthermore, he notes that "very often it was regional governments, African chiefs, and local recruiting interests rather than the Chamber of Mines which determined the way African labour was mobilised and used on the Rand".[5] Jeeves thus declares that "from the earliest days of the industry through to the 1920s mine labour recruiting remained an unstable, expensive conflict-ridden enterprise. Even a cursory examination of the history of labour recruiting makes a joke of the idea that mining capitalism was all powerful in this period".[6]

Chaotic and haphazard recruiting thus dominated the early decades of this century. The period of reconstruction was characterised by a lack of available labour, so much so that Chinese were used for a few years. In this period the Witwatersrand Native Labour Association (WNLA) was responsible for recruiting. Its inability to solve the industry's labour shortages led in part to the formation, in 1912, of the Native Recruiting Corporation (NRC). Whilst there appears to have been some initial competition between the two this was resolved by their agreeing to recruit in different areas. The NRC therefore recruited in South Africa, primarily in the Cape reserves, as well as in the High Commission Territories (Botswana [Bechuanaland], Lesotho [Basutoland] and Swaziland), whilst the WNLA recruited from beyond South Africa's borders, mainly in Portuguese East Africa (Mozambique) and Nyasaland (Malawi). This is not to suggest that miners only arrived at the mine gates under the eye of either the WNLA or the NRC; there was a steady stream of "voluntary" miners who arrived under their own

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[3]Peter Richardson's Chinese Labour has some comparable information on recruiting methods used to "entice" chinese to South Africa. See also Crush, J., Jeeves, A., & Yudelman, D., South Africa's Labour Empire: A History of Black Migrantcy to the Gold Mines (Cape Town: David Philip, 1991) 33-55.

[4]See also Paton's PhD thesis.

[5]Jeeves, Migrant Labour 4.

[6]Jeeves, Migrant Labour 11.

steam. Certain mines were chosen before others, according to the general manager of the NRC, H.M. Taberer, because "some mines are much more difficult to work in than others, owing to the steepness of the stope. They [Africans] have their own peculiarities, and they like to go where their friends are sometimes. A mine gets a reputation which Natives make for it, and they like to be together. All sorts of conditions govern the choice of the Native as to where he wants to go".[7]

It is extremely difficult to append any numbers to the "voluntary" labour phenomenon. In times of labour shortages, which occurred regularly, mines were only too happy to see new workers queuing at the gates. A good example of a "voluntary" labourer is to be found in Peter Abrahams's novel Mine Boy. Xuma, the "mine boy", is recruited by simply going to the mine with a fellow miner.[8] Interestingly both were unusual characters in the sense that neither lived in a mine compound. According to Jeeves, this form of labour suited the returning, hence more experienced, miners as they were usually in a better position to achieve shorter contracts, vital for ensuring one was able to return home for agricultural duty.[9] The mining companies distinguished among three different categories of volunteer:

> The "local" was an African transferring from non-mining employment in Johannesburg to one of the mining firms. A "mine" volunteer was transferring from one mine to another after the expiry of a contract, while a "new" volunteer had arrived independently in Johannesburg from one of the country districts. About 70 per cent of the volunteers fell into the last category. They were much in demand on all the mines since they were normally experienced workers who had chosen themselves to return.[10]

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[7]TA, K26, H.M Taberer's evidence to the Native Economic Commission, 5 May 1931, 7313. According to Hugh Tracey the Chopi, from Mozambique, sing a song in which they describe how miners on arrival at a mine attempt to bribe the compound police "to speak on their behalf to the compound manager in order to get them good jobs". Apparently while a bribe is never refused, good jobs are scarce and the miners are often disappointed [Tracey, H. Chopi Musicians (London: Oxford University Press, 1948) 30-31].

[8]Abrahams, P., Mine Boy (London: Faber & Faber, 1954).

[9]For a discussion of the "voluntary" labour question see "The Recruiting Nexus" in Jeeves, Migrant Labour. An issue that requires further research is the informal "grapevine" that informed black rural dwellers about the mines. In South Africa many of the Cornish miners came from a tradition of mining in the family. It would be interesting to establish whether or not black miners had similar traditions. Certainly both van Onselen and Gordon have found ample evidence of this "foreknowledge" [Van Onselen, Chibaro 234 and Gordon, R.J., Mines, Masters and Migrants (Johannesburg: Ravan Press, 1977) 86].

[10]Jeeves, Migrant Labour 154. See also Figure 6 in Jeeves (155). It graphically depicts how many voluntary labourers were employed by WNLA companies between 1905 to 1920. 1918 appears to have seen the highest number of volunteers employed: a figure of over 100 000 miners is given. About a quarter of these

By the 1930s the voluntary system had developed further to include the Assisted Voluntary System (AVS). Under this scheme miners who had passed the medical examination had their fares and travelling expenses advanced to them. In return, the miners signed an undertaking to apply for employment within thirty days on any Witwatersrand gold mine, where they might work for between one and six months. If the miner worked more than 270 shifts, under one contract, he had his rail fare refunded.[11] The gradual increase in the number of voluntary labourers, depicted by Jeeves, had an important effect on the mining industry. This class of labourers tended to come from within South Africa's borders; consequently, as will be discussed later, they often arrived in a weakened state as a result of inadequate food supplies in the rural areas - a major factor in the high prevalence of TB and pneumonia on the mines. The 1932 Low Grade Ore Commission noted that growing numbers of recruits were coming from the Union, Botswana, Swaziland and Lesotho, whilst the numbers from Mozambique and Malawi remained relatively static.[12] The other side of the coin is desertion, which will be discussed in chapter three.

The changing nature of recruited labour is significant for a number of reasons. Firstly, it signifies that the Chamber was able to draw labour from a number of different sources. Thus when one source was cut off it was able to find labour elsewhere. Secondly, the increase in recruited South Africans was a major reason for the high incidence of TB and other diseases in those areas (see chapter five). Thirdly, the fact that migrants were recruited from such a wide area meant that 'industrial diseases' were spread far and wide throughout Southern Africa.[13]

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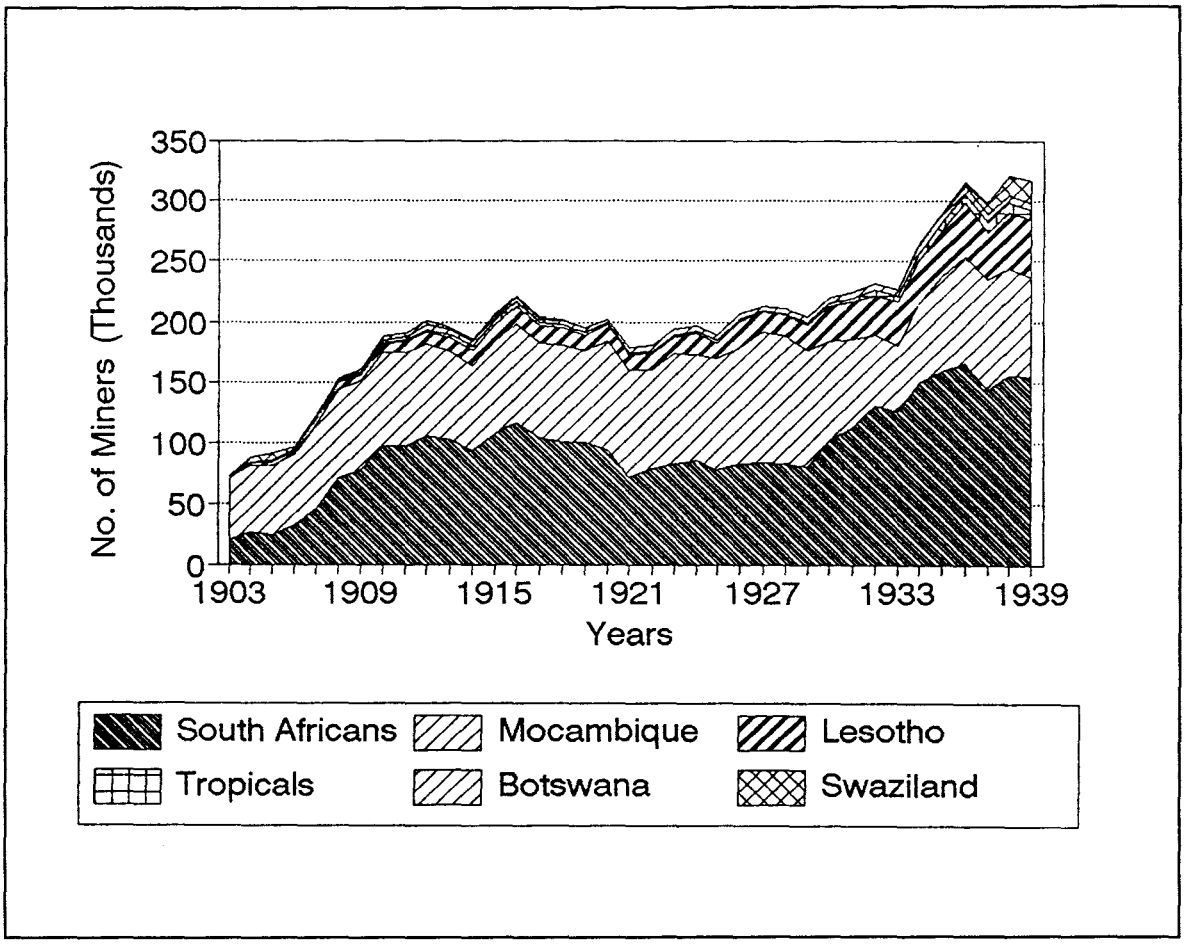
volunteers were miners transferring from one mine to another (Jeeves, Migrant Labour 269).

[11]Statement No. 3, Evidence of the Gold Producers Committee, Chamber of Mines, to Native Laws Commission of Enquiry, 1947 (Johannesburg: Chamber of Mines, April 1947).

[12]In fact the 1928 Mozambique Convention stipulated a reduction, in labour from Mozambique, from 100 000 to 80 000 miners per annum (UG16-1932 105).

[13]This was largely due to the mining industry's insistence that the migrant system remain. Migrant workers thus returned home regularly, ostensibly to protect their health. For a more detailed discussion of this topic see chapters five and six.



Graph 2: Recruitment Areas and Totals of African Miners, 1903-1939. *Source: Jeeves (Migrant Labour 265-267) & Van der Horst (Native Labour 216-217).*[14]

Mine managers apparently preferred the "East coast Native" above the rest as he "stays longer, returns often and managers experience no difficulty with him underground".[15] The "East Coaster" was from Portuguese East Africa, South of Latitude 22° degrees South. Apparently they made up about half the underground workforce. They were "among the first to be recruited for the Rand...the most consistent underground mine boy employed. Their contracts are for longer periods than most natives...Further they go underground more readily than others and they are usually employed on hammer and machine

[14]Van der Horst, S.T., Native Labour in South Africa (Cape Town: Oxford University Press, 1942).

[15]Cited in Bozzoli, B., The Political Nature of a Ruling Class: Capital and Ideology in S.A., 1890-1933 (London: Routledge and Kegan Paul, 1981) 71.

work".[16] Furthermore, they often renewed their contracts, and some stayed as long as 5 years on the mines.[17]

Travelling to the Mines

Miners recruited for the Witwatersrand gold mines, as the opening quotation illustrates, came not only from South Africa and South Africa's neighbours but also from further afield. In other words African miners came from Malawi, Northern Rhodesia (Zambia), Southern Rhodesia (Zimbabwe), Mozambique, German East Africa (Tanzania), Lesotho, Swaziland, Botswana and even from the Belgian Congo (Zaire) to work on the mines.[18] Having to travel such distances posed certain logistical problems. Whilst in the early days of the mining industry miners walked to the mines, the opening of the railways, and later motor transport, changed the whole picture significantly.[19]

After being recruited the miner had to get to the mines. In the period under discussion miners gradually used the railways more and more, especially as the remote areas of Southern Africa were connected to the main railway lines.[20] In many instances miners had to make their way, usually on foot, to the

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[16]Dr G.A. Turner, WNLA doctor, quoted in Katz, PhD thesis 10.

[17]Katzenellenbogen, 63.

[18]A useful overview of labour export policy, dominated by the gold mines, is Paton's PhD thesis. Importantly Paton notes that whilst the Rand gold mines were the largest employer they were not the only employer, thus illustrating the competition that developed between local agricultural and industrial concerns against the Rand mining houses. For example, Malawi plantation owners regularly petitioned British officials about the shortage of labour due to many Tropicals being transported South up until the ban in 1913 (34-44).

[19]In March 1903 at the Bloemfontein Railway Conference the Central South Africa Railway was established which, over subsequent years, significantly increased rail routes to the Rand (Davenport 226). Comparable railway construction, albeit on a smaller scale, also occurred at about this time in other neighbouring countries. In the period 1890 to 1945 Dawson found, in Kenya, that "the colonial transportation network contributed indirectly to the deterioration of health during the first three decades of this century". As a result of roads and a railway that spanned the country infections were able to spread like wildfire [Dawson, M.H. "Health, Nutrition, and Population in Central Kenya, 1890-1945," in Cordell, D.D., & Gregory, J.W., (eds) African Population and Capitalism (Boulder, Colorado: Westview Press, 1987) 201-217].

[20]Miners walking to the mines were often victims of both corrupt officials and other criminal elements who robbed the recruits of the little cash they may have been carrying. These occurrences have been well documented, especially for diamond miners travelling to, or from, Kimberley. See Worger W.H., South Africa's City of Diamonds (New Haven: Yale University Press, 1987), Turrell, R., Capital and Labour on the Kimberley Diamond Fields, 1871-1890 (Cambridge: Cambridge University Press, 1987) or Sieborger, R.F., "The Recruitment and Organisation of African Labour for the Kimberly Diamond Mines, 1871-1888," (MA

nearest station. An example of the kind of journey that a prospective miner might undergo to reach the mines might unfold as follows. Once recruited, in this case at Inharime, Mozambique, where the miner was given a blanket (deducted from his first wage packet) the miner would embark on a 10 day walk to the Ressano Garcia compound and railway station (on the border between South Africa and Mozambique). After a cursory medical check up, the nature of which will be discussed in chapter five, the miner boarded the train for Johannesburg. For a journey that might last as long as forty eight hours cattle trucks, often without roofs, were provided on this particular line. Jampacked into each carriage, occupants must have found sleep very difficult, especially as "in the commonest type of carriage, there is a long bench down the middle which is filled with natives sitting back to back, with nothing but each other to lean against...on a journey which involves two nights in the train this must be extremely fatiguing".[21] Prior to 1905 the journey between Ressano Garcia and the Witwatersrand was broken at Waterval Boven, but the mines discontinued this station as an unnecessary expense. While food was generally provided on the trains sanitary provision was not, nor apparently was water.[22] Evidence to the Native Grievances Commission recorded that miners would sometimes refuse to board such trains. Furthermore, they often refused to pay the railfares, as one miner noted "I am always given to understand that the trains belong to the government, and I think that if the government wants us to come up here and work, then the government should pay my train fare".[23]

Isolated attempts were made by the railway authorities to alleviate conditions, usually in response to

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thesis, Rhodes University, 1975) for the details. For details on gold miners see Callinicos (1: 32-35) and van Onselen (2: 117-201).

[21]TA, K358, evidence of Mr A.B. Tucker to the NGC, 27 October 1913. See also Ellsworth, R., "The Simplicity of the Native Mind: Black Passangers on the South African Railways in the Early Twentieth Century," in Lodge, T., (ed) Resistance and Ideology in Settler Societies. Vol.4 of Southern African Studies (Johannesburg: Ravan Press, 1986) 76-95. These carriages were known as the "bombella" (Ellsworth 76).

[22]A number of photographs exist of the train journey miners undertook to get to the mines. For example, see the Illustrated London News 28 February 1905; or Kallaway et al. 12 (nos. 22 & 24). The description of the journey was taken from COMAR (1905) 320 & 356. The recruit mentioned in the example, died soon after arriving on the mines, no doubt exhausted after such a trying journey. The Director of the NAD attempted to establish the reasons for the miner's death, but nothing further was reported on the matter. Apparently this was not an isolated event.

[23]TA, K358, evidence of an unnamed miner to the NGC, 28 October 1913.

vociferous outbreaks of criticism by African commuters. Pirie records how in 1904 the Cape Government Railways (CGR) appointed a "troubleshooter" - known as the "Railway Protector of Natives" - whose task it was to investigate complaints about the CGR.[24] A further reason for the appointment of the "protector" was that some officials were aware that problems with transport had contributed "in no small measure to the difficulty...in inducing Native labourers to proceed to the Gold Fields and elsewhere".[25] In most instances the coaches used by the CGR were designed to protect African passengers "from the elements" rather than provide comfort, so the carriages usually had a roof but often had no seating. As one official put it, this was because "seats are unnecessary and not desired by the great majority of Natives who travel, while the absence of seats makes the vehicle available for the loading of goods when not required for the conveyance of Natives".[26] On more than one occasion the "protector" witnessed "Africans consigned to a truck the sides and floors of which were caked with dung".[27] The post of "protector" was discontinued at the end of 1904 as the CGR felt improvements were sufficient, an assessment Pirie has correctly disputed by noting how for many years after 1904 complaints about railway travel continued to be received by the CGR from African passengers.[28]

Johnstone in his comparative study of the Rand mines and Siberian gold mines aptly refers to the journey to the mines as a "middle-passage".[29] The image conjured up derives from the trans-Atlantic slave trade. Just as the slaves' first taste of what lay ahead occurred on the ships, so too were the miners given their first taste on the cramped trains to the mines.

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[24]Pirie, G.H., "The Cape Colony's 'Railway Protector of Natives', 1904," Journal of Transport History, 7 (1986): 80-92.

[25]Letter from Secretary of Native Affairs (Cape Town) to Secretary of Native Affairs (Johannesburg), cited in Pirie 84.

[26] Cited in Pirie 81.

[27]Pirie 87.

[28]See also Howard Phillips's descriptions of the packed trains transporting dying miners back to the reserves during the 1918 Spanish Influenza Epidemic ('Black October' 6).

[29]Johnstone, F.A., "Rand and Kolmya: Afro-Siberian Hamlet," in South African Sociological Review, 1 (April 1989): 1-45.

Mine Work

> The native... has been frequently described as a muscular machine.[30]

Burawoy has pointed out that "it is one thing to produce or recruit a particular type of labour power, but quite another to turn labour power into labour".[31] The following generalizes how African recruits became miners and the nature of work performed by miners underground. While there were changes over time, documented below, the key essence of the work - that it was labour intensive - remained.[32] Levy reminds us that "apart from rock drilling, practically all the underground transport of ore from the stopeface to the shaft...[and]..tramming was done by hand labour", until well into the twentieth century.[33] Much of the legislation governing minework undertaken by African miners was laid down in the 1911 Mines and Works Act. The Act stipulated that neither women nor boys under sixteen (later changed to fourteen) could work on the mines.[34] Furthermore, work on Sunday was prohibited and a maximum working week of forty seven hours was specified. Miners were only supposed to work a maximum of eight hours a day. It will be shown later how seldom this was enforced. Of great importance to African miners was the "colour bar" clause within the Act, which specified that only white miners would be able to hold blasting certificates. Miners without blasting certificates were unable to charge the drilled holes, a key supervisory role underground.

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[30]Report of the Economic and Wage Commission, UG14-1926 321.

[31]Burawoy, M., The Politics of Production (London, Verso, 1985) 221. According to Burawoy transforming labour power into labour is achieved through particular "political apparatuses of control" within any political system. In other words, the system is dominated by coercion and control (see Burawoy 221-236, for details). In a slightly different approach Gordon has noted how miners on arrival learn the "Law" of the mine, "explanatory information as to the behaviour of the whites, how to stay out of trouble with them and with fellow workers". Importantly he stresses that "discovering and formalizing this 'Law' is an ongoing process stretching right throughout the migration sojourn at the mine" (Gordon 88).

[32]In the period under discussion it would appear that African miners were seldom told what was expected of them underground until they actually got underground where "boss boys" and white supervisors soon put them right. In sharp contrast to this white miners were given some form of training. One assumes that the "grapevine" informed new African recruits about what to expect underground, but without oral evidence it is extremely difficult to know whether in fact this was the case.

[33]Levy, N., The Foundations of the South African Cheap Labour System (London: Routledge & Kegan Paul, 1982) 15.

[34]This particular clause remains to this day, thus preventing women from becoming mining engineers.

A good example of the type of work done underground by the African miner, as opposed to the white miner, can be seen in the following extract from the Report of the Low Grade Mines Commission of 1920:

> The white miner, for example, is the first to enter his working place in the morning. His last act on the previous shift was to light up his fuses for blasting, and it is now his duty to see that the place is safe enough for his gang to work in before letting them commence their tasks. He enters with a few natives, dresses down loose pieces of rock which might fall and endanger life or limb, and generally makes the place secure. He also examines the face for misfires and sockets and places a wooden plug in them when found, so that natives should not drill into them by mistake and possibly cause an explosion, and sees to it that the whole place is thoroughly drenched with water to prevent dust. He then admits the remainder of the natives, points out the position and direction of the holes to be drilled, assists in the rigging of the machine drills, and gets the work well under way. When he feels that he can safely leave the natives to continue their tasks, he proceeds to the place where his explosives are stored, prepares his cartridges, fuses and detonators for blasting, returns to the working place to see to the finish of the process of the drilling, fetches his explosives, sends the natives out, charges up his holes, places guards to prevent persons entering by mistake, lights up his fuses, either in person or by means of natives acting under his immediate eye, and proceeds to the shaft to be hoisted to the surface. The natives in his gang will have rigged up the machine drills, done the drilling, and shovelled the rock, broken by the previous day's blast, to the bottom of the stope to be transferred to trucks, and generally done all or nearly all the manual work required.[35]

The type of work done underground (stoping) can be divided into two categories, lashing and tramming on the one hand and drilling on the other.[36]

> Stoping is the exploitation laterally of the reef on both sides of the raise...It is conducted by drilling holes in the reef and firing the contained charges of explosives at the end of the shift. The broken ore is removed on the following day to the level below and thence to the shaft bins. The working place in which all the work is performed before the broken ore is finally transported to the shaft bins is known as a stope.[37]

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[35]UG34-1920 25-26. Note that in a recent article Katz argues that it is incorrect to refer to all whites underground as "miners" as there were white professionals who "constituted a separate category of worker[s]". For more detail on the distinctions see Katz, E. "Mining by Default: Afrikaners and the Gold Mining Industry before Union," in South African Journal of Economic History, 6 (March 1991) 61-80.

[36]Miners were also used to sink the shafts before the actual mining could take place. For a comprehensive discussion of shaft sinking, and the monopolisation of this job by the Basotho, see Guy, J., & Thabane, M., "Technology, Ethnicity and Ideology: Basotho Miners and Shaft Sinking on the South African Gold Mines," JSAS, 14 (January 1988) 257-278.

[37]Watermeyer, G.A., & Hoffenberg, S.N., Witwatersrand Mining Practice (Johannesburg: Transvaal Chamber of Mines, 1932) 160. Watermeyer was said to be one of the foremost experts on gold mining engineering and was Professor of Engineering at the University of the Witwatersrand when he wrote this book. A raise was a tunnel which connected "the 'drives' on different levels, and follow[ed] the plane of the reef. When driven upward they [we]re called 'raises' and when downward they [we]re known as 'winzes'" (Cartwright, The Gold Mines 331). A drive was a horizontal tunnel, "driven along or parallel to the plane of the reef" (Cartwright, The Gold Mines 330).

Usually the new shift went down once blasting had been completed. The first few hours would be spent clearing up the rock and rubble that had been displaced by the blasting. Once the rock had been transported away in the trams the miner would commence drilling for the next blasting.[38] The stopes were in complete darkness except for the light the miner took down with him, which in the early period was a candle.[39] Miners complained that in many instances the candle they were provided with did not last the whole day and that they were forced to work in the dark or to buy additional candles at their own expense.[40] New recruits were generally trained by being placed with experienced miners. Those who were going to end up as drillers, the majority of miners, would be given a probationary period of about fourteen shifts to learn to drill. There were some differences between mines and also in approaches to the training. By the 1930s mining schools were being developed on the mines to give instruction in underground work.[41]

African miners were expected to be underground by the time the white miners arrived. This meant that

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[38]Whilst the majority of black miners were employed in drilling there were a considerable number (more than 80) of different jobs that black miners were engaged in on the mines. The NRC's "Schedule of Rates of Pay" distinguishes between hand drillers and machine drillers, and those involved in tramming and shovelling work. Furthermore, the contracts identify a further 25 jobs underground, which included shaft cleaning, sweepers, pipelayers and rock drill fitters. On the surface Africans were employed in the reduction works as well as in the mines's engineering works. They were also employed in the compound - cleaners, police, chefs - and as clerks and hospital orderlies. Interestingly there was even provision made for paying under-age miners, despite the fact that this was a contravention of the 1911 Mines and Works Act. Buckle, the Native Grievances' Commissioner, was critical of the practice whereby miners first had to do lashing before they could drill, especially as the piecework nature of their contracts means they are not paid for this work. Although he "received complaints of an excessive amount of lashing being demanded from nearly every mine", he felt many were exaggerated, without explaining why. However, he did point out that according to the NRC contracts "there is no stipulation that in addition to this drilling, the hammerboys shall do any lashing whatever; in other words, the mines using hammerboys...have no right to claim from them any work beyond this" (UG37-1914 11).

[39]By 1905 electricity, provided first by generators and then later by the Victoria Falls and Transvaal Power Company Limited, was used on several mines. Over time the others followed suit. Whilst used largely for driving machines (including drills and ventilation fans) it was also used for underground lighting. Once a shaft or stope had been fully established electric lighting was usually installed. However, the actual stoping was usually done without this form of light. For details of electricity's role in mine mechanisation see Christie, R., Electricity, Industry and Class in South Africa (London: Macmillan, 1984) especially pages 5-26. The mine safety lamps, used, for example, on British coal mines, were not used by the majority of the African miners for much of this period. Cost factors must have been the only reason as lamps were more expensive than candles.

[40]TA, K358, unnamed African miner's evidence to the NGC, 28 October 1913.

[41]Evidence of H.M. Taberer to the Native Economic Commission, 6 May 1931, 7379-7387.

on many of the mines the shift would begin to go underground at about 4.00 a.m.. Before going down the miners would have had to walk to the mine and consume some form of ration. A contributing factor to the hour of the descent was the size of the cage; the smaller the cage, the earlier miners had to start going down. Cages accommodated between six and thirty six miners at a time.[42] In 1920 the Chamber of Mines did a survey to establish how long African miners were actually spending down below. They found that more than 87.45 per cent of them spent more than the legislated maximum limit of eight hours underground at a stretch. The average length of time was 9.35 hours.[43] On completion of the day's work miners would often have a long wait before being allowed up. Often they simply cluttered up the stopes: as one witness remarked, "they say they loaf about in the drafty slopes and everybody who comes kicks them out of the way for being in the way".[44] Some managers admitted that they kept the miners down for longer periods so the miners might "drill further inches beyond the stipulated standards".[45] The opposite also happened, usually when a white miner wanted to finish early. It was in such instances that the "loafer ticket" would be issued. This ticket was issued to miners who did not complete drilling the stipulated hole length. Miners with such a ticket were therefore usually allowed to fetch their rations but not their wages for that day. Hard rock or difficult working conditions were not the only reason for such a ticket being issued as the following case study illustrates. An African miner complained that his normal work day began when he went down at 5.00 a.m., whereupon he did lashing work till about 12.30 p.m. He was then instructed to drill, but at about 2.30 p.m. the white miner would arrive to charge the hole. The miner had drilled between eighteen to twenty four inches which was short of the stipulated length and thus the white miner issued a "loafer ticket" to the African miner. The reason the African miner complained was that he had only received

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[42]Buckle, as Native Grievances Commissioner, received numerous complaints about the considerable delays in transporting miners up or down the shaft, which was aggravated on some mines "by having no shelter to wait in at the shafthead" (UG37-1914 10).

[43]COMA, Association of Mine Managers in the Transvaal, "Analysis of Hours Spent Underground by Natives on 31 Mines," December 1929.

[44]TA, K358, evidence of T. Williams to the NGC, 15 October 1913.

[45]UG37-1914 9.

four work tickets in eight months, the rest had been "loafer tickets"![46] At that rate the miner was clearly never going to finish his contract.

The mining process underwent significant changes over the years, with certain repercussions for the African miner. Foremost amongst these changes was the move from the manual hammer drill to the mechanical drill. In other words the "Hammerboy", the miner who knocked the drill into the rock with a hammer, was replaced by miners who used mechanical drills. Prior to 1912 two types of mechanical drills existed on the mines. The first, introduced in the 1890s, was known as the reciprocating drill, very heavy (75 to 112 Kilograms in weight) and lacking in mobility. A dry drill, it struck about 1 200 blows per minute, produced enormous clouds of dust and made large holes which were bad for blasting. Furthermore the miners disliked it not only because of its weight but because drill bits were difficult to change. The second type of drill was the "Hammer Type Air Fed" machine. The latter spawned the generation of Hammer Type machines of which the Ingersoll-Leyner machine was the most famous. It was much lighter (about 56 Kilograms), superior in design due to the position of its piston, and also struck about 1 200 blows per minute. After 1912 the Jackhammer drill was also used, usually for stoping. The other important feature of the Hammer Type drill was that it allowed water to be passed through the hollow drills to dampen the rock face and thereby reduce the amount of dust in the stope, something the reciprocating drills did not allow. Dangerous amounts of dust, however, continued to be blown around, because the compressed air in the drills continued to exacerbate this problem.[47] Mechanical drills, worked by two men, could, according to Wilson, "produce as much as twelve with hammers".[48] Hand drills were not phased out entirely as there were places where the mechanical drill was too clumsy. In 1928 some "7.8 percent of the total fathomage of ground stoped" was done by hand

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[46]TA, K358, evidence of an unnamed miner to the NGC, 28 October 1913.

[47]Much of the information in the above paragraph comes from Watermeyer et al. 116-118. There is, however, some debate about the dates mentioned in the paragraph, as different mines introduced different drills for a variety of reasons. Finance, electricity and air supply were major factors in the introduction of new drills. The dates should therefore be seen as signalling different periods of technological change rather than absolute moments of discontinuation. See also Burke et al. "The Profits of Death" 147-171.

[48]Wilson 84.

drills, the Jackhammer accounting for the most fathomage stoped.[49] It was the drilling that contributed to the majority of the dust that filled the air underground and was consequently the job that led the miner to be exposed to the most amount of dust.[50] However, it was not the only producer of dust. Underground dust was also produced by blasting and lashing (ore removal). The latter was seen, second only to drilling, as a job that exposed miners to significant amounts of dust.[51] High temperatures and humidity aggravated the situation down below. Surface work was also very dusty, especially in the crusher house.[52]

Damage from silicosis (miners' phthisis) is caused by particles of silica dust which fail to be trapped by water droplets. The most successful method of prevention was to wear masks, but these were cumbersome and also made miners very hot, so that consequently they seldom used them. Increasing ventilation at the origin of the dust was seen to have some beneficial effect.[53] Katz has pointed out that methods for preventing silicosis were largely designed by mine engineers and had little to do with the medical fraternity.[54] The two methods were spraying the surface, to prevent as little dust from leaving the rock as possible, and ventilation. The latter, arguably more effective than spraying, was far more expensive.[55]

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[49]Watermeyer et al. 403. According to Johnstone each Jackhammer drilled between 20-40 holes per shift, as opposed to 4-6 holes per shift with the earlier more clumsy drills (Johnstone, F.A., Class Race and Gold: A Study of Class Relations and Racial Discrimination in South Africa [London: Routledge and Kegan Paul] 142).

[50]Katz, PhD thesis 548.

[51]Katz, PhD thesis 548.

[52]Richardson, P., "Miners' Phthisis in the Transvaal Gold Mining Industry, 1886-1918," London: paper presented at African Studies Association of Great Britain Conference, 1978.

[53]COMA, "Resolutions Adopted by the International Silicosis Conference," Johannesburg, 13-27 August 1930. The workers most exposed to dust were the "East Coasters", who were renowned for their drilling exploits (Katz, PhD thesis 69). Furthermore they were semi-permanent, as they spent between 2 to 6 years on the mines (see chapter five for more details of the incidence of silicosis).

[54]Katz, PhD thesis 157-160. As will be discussed later, the medical fraternity were obsessed with curative measures and appear to have had little to do with silicosis.

[55]For details of the debate over ventilation see Katz, PhD thesis, chapter three.

Another innovation that speeded up the drilling was the introduction of the drill sharpening machine.[56] Prior to its introduction drill sharpening was done by hand, a slow and laborious process. In the 1930s locomotives were introduced to replace rope haulage, assisted by the simultaneous introduction of mechanical scrapers and lashers which all contributed to speeding up the removal of rock from the stopes to the surface.[57]

Underground temperatures

One factor that hindered rock removal was the increase in the underground temperature. The deeper the mines went the hotter they became, increasing in temperature at about 1° Fahrenheit (F) for every 220 feet below the surface. At 6 869 feet, reached by some mines in the 1920s, the temperature was 96.1°F. By the early 1940s the deepest gold mine was Crown Mine which had reached 8 685 feet, where the temperature of the rock, before cooling, was 103°F.[58] High temperatures below resulted in heat stroke and sometimes death for the miners. Mines had various degrees of successes at lowering temperatures, a complex process influenced not only by the type of ventilation system used, but also by the amount of water being used and the type of lighting. Underground fires and, obviously, the number of miners below also influenced the temperature.[59]

The deaths of four African miners on the Village Deep Mine between September 1925 and January 1926 were the first recorded cases of heatstroke on the Witwatersrand gold mines. Before dying the men had all exhibited the classic symptoms of heatstroke - dizziness, difficulty breathing, spasms, disorientation and an excessively fast heartbeat. By February 1930 a further 51 African miners had died of heatstroke, prompting the authorities to enforce stronger preventative measures on the mines. The most important

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[56]The introduction of drill sharpening did, however, lead to a steady decrease in the number of black and white workers involved in that type of work. Between 1921 and 1931 white miners, employed as drill sharpeners, declined from 368 to 232; while black drill sharpeners declined from 407 to 304. (UG16-32 20).

[57]Wilson 84. Interestingly Wilson notes that the term "lashers" may be a derivative of the Xhosa word ukulayisha (to load).

[58]For a comprehensive discussion of the problems created by high temperatures for deep level mines see Report of the Committee on Deep Level Mining, UG18-1945.

[59]Watermeyer et al. 591-595.

of these was to ensure that all new recruits, who had never been underground before, participated in a probationary period of twelve days of light work before undertaking any more arduous mine work.[60] However, despite the mines' commitment to such measures miners continued to die of heatstroke.[61]

Attitudes to Work

Mining is not only hard work but is also extremely dangerous. While the issue of accidents and African miners' ability to recognise danger will be discussed in chapter six, brief mention must be made of African attitudes to underground work. Burawoy in his study of machine operators in the United States of America set out to answer the question "why do workers work as hard as they do?"[62] Although his study was examining factories in the 1970s in the USA, and not mining in South Africa before World War Two, he raises some pertinent issues which can be related to this study. While miners, as will be shown below, obviously worked for wages it is not clear why they worked as hard as they did. Three reasons why miners worked as hard as they did can be outlined as follows: Firstly, miners usually had their tickets marked only if they had drilled the stipulated length of hole. Secondly, the element of coercion also played a role. The labour process "must be understood in terms of specific combinations of force and consent that elicit cooperation in the pursuit of profit".[63] The following section illustrates that the level of violence underground by shift bosses ensured that miners were to do the task. Thirdly, Burawoy has shown how workers compete amongst each other to complete tasks which, ironically,

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[60]SAB, GES, 930 702/13c, E.H.Cluver, Assistant Health Officer of the Union, to the Secretary for Public Health, 2 April 1930.

[61]Between 1930 and 1936, for example, sixteen miners died on the City Deep Mine, while a further twenty seven miners, on the same mine, recovered after collapsing from heatstroke. Treatment for heatstroke usually included attempting to reduce the miner's temperature as quickly as possible by placing them in some sort of cool environment (cold water bath or ice if available). The Corner House tested new recruits by placing them in a heated chamber (96°F) for an hour, during which time the miner was required to shovel broken rock across the floor. The miner was then allocated a probationary period, the length of which was dependent on the miner's performance in the chamber. The use of the chamber was based on a series of experiments in which miners were made to work in extremely hot temperatures for long periods of time. During the experiments miners tended to collapse after about two hours, so it was therefore suggested that the test in the chamber should only last one hour. For more details of these experiments and other issues related to heatstroke see Orenstein, "Report of the Year 1936" 43-45 & 74-113.

[62]Burawoy, M., Manufacturing Consent (Chicago: The University of Chicago Press, 1979) xi.

[63]Burawoy, Manufacturing Consent 30.

ultimately benefit the employer. On the mines lashing had to be completed before drilling could begin, thus all the miners were expected to pull their weight to ensure the drilling could begin as soon as possible. However, the differences in the hardness of the rock and the position of where the drilling was to take place meant that workers probably competed for favours from either the "boss boy" or the white supervisor. Furthermore, drilling was dependent on the allocation of sharp drills which relied, in turn, on the ability of the African miner to get on with the person who was allocating the drills.[64]

Moodie has argued that miners turned to muti (magical medicine) to protect them underground.[65] A contributing factor to workers' survival underground was the "rough male camaraderie" that develops between miners. Apparently, "sexual expletives and crude accounts of sexual activity pervade underground conversation amongst miners world-wide," and "fierce masculine pride in holding down such a tough job helps keep incapacitating fears at bay".[66] The other major fear, apart from accidents, that miners underground had constantly, as will be discussed later, was the fear of "undefended hittings" from white gangers.[67]

A major irritation for African miners was the fact that the white miner spent most of his time underground sitting "on his box in the haulage, his picannin (personal retainer) on guard relaxing in the company of fellow white miners. Periodically he sends out instructions and asks for reports about work progress".[68]

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[64]For details on this particular issue see Burawoy, Manufacturing Consent 46-73.

[65]Moodie, D., "Social Existence and the Practice of Personal Integrity: Narrations of Resistance on the South African Gold Mines," in Spiegal, A.D., & McAllister, P.A., (eds) Tradition and Transition in Southern Africa (Johannesburg: University of the Witwatersrand Press, 1991) 29-63. Patrick Harries has found that miners used the muti to protect themselves from some form of spirit that flew around underground and attempted to stamp some kind of mark on the miners. Once stamped the miner was liable to be killed within a short period of time (personal communication, see his forthcoming book for details).

[66]Moodie, "Social Existence" 49.

[67]Moodie cites a number of sources which have found evidence of this ("Social Existence" 50).

[68]Moodie based this statement on information he had received from a "fairly wide range of sources" ["The Formal and Informal Structure of a South African Gold Mine," Human Relations, 8 (1980) 564]. The haulage was a "terminal used for the mechanical transport of broken rocks and ore from the working place" (Cartwright, The Gold Mines 330). According to Nadine Gordimer, in The Lying Days (London: Victor

Colour Bar

A significant stumbling block to the aspirations of African miners was the infamous colour bar. It is well known that Frederick Johnstone's search for the origins of the colour bar prompted, and continues to elicit, extensive debate amongst South African historians. Whilst a comprehensive examination of this debate is beyond the scope of this thesis, some aspects of the debate pertain directly to the issue of workers' health. Of particular relevance is Elaine Katz's recent PhD thesis, in which she convincingly challenges the idea that the origins of the colour bar lay in the fear, by white miners, that the "ultra-exploitable" African labour would replace them on the mines.[69] Instead she argues that the origins lay in a number of "co-existing" issues, because

> from 1892 to 1899 neither the inception of the migrant labour system nor its entrenchment provided white mineworkers with a dominant motive for demanding the introduction of the colour bar. Also, during this period white mineworkers were not the sole proponents of the colour bar. In certain selected job categories, both the state and the mineowners favoured it, too. All the parties that supported the colour bar reasoned that whites, whom they perceived as being intellectually superior to and more responsible than non-whites, were best fitted to hold jobs which affected the lives and safety of other mineworkers.[70]

Katz argues that while some white workers were worried about "unfair competition", it was the "safety rationale which underpinned" job reservation.[71] As evidence of this, she draws attention to the fact that all the mining legislation passed in the period before the South African War reserved only certain jobs.[72] Blasting and skip driving were reserved for whites only, the latter as a result of many accidents involving cages. Other jobs, such as pump and engine drivers, as well as track layers, were open to both African and white. However, Katz does point out that it was only a small group of African miners, permanently employed on the mines, that was ever eligible for these types of jobs. Attempts by white engine drivers of ore cages and cocopans to obtain protection under the colour bar were refused on

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Gollancz Ltd., 1953), white shift bosses used African members of their gang to do gardening for them on Sundays. They were able to elicit this type of work from underground workers because the latter "belonged to the white bosses underground". This possession was ensured by "an occasional good crack" which "knocked the nonsense out of the boys and kept them attentive and respectful, without malice on either side" (33).

[69]Katz, PhD thesis 385-394.

[70]Katz, PhD thesis 385.

[71]Katz, PhD thesis 386.

[72]Katz makes mention of the Acts passed in 1893, 1896, 1897 and 1898 (PhD thesis 387-388).

the basis that Africans were capable of operating the machines at no safety risk to anyone.[73] Thus jobs protected by the colour bar were the ones which required experience that could only be acquired by being on the mines for a period of time which the majority of migrant workers would always have fallen short of.

However, this changed, according to Katz, as the result of the arrival of indentured Chinese labour. Not only did the Chinese help alleviate the labour shortage after the war, but they also posed a threat to white miners' job security. White miners felt that the Chinese had a greater potential for becoming skilled labour than did African miners and they therefore convinced the Milner government to prevent the Chinese from performing certain jobs on the mines.[74] It was this "experience which management derived from the employment of indentured Chinese labourers" that "significantly altered its perceptions of the utility and advantages of African migrant labourers".[75] In other words just as Chinese were capable of doing certain jobs so to were African miners. Coupled to this growing awareness that African miners had the ability to perform skilled work was the evidence displayed by them during the 1907 strike, during which they kept many of the mines in operation.[76]

It is well documented that the Chamber did not attack the colour bar at this point, but did so in the decade after the 1913 white miners' strike as a result of the profitability crisis in this period. Whilst the colour bar remained, the ratio of white to African miners had increased sharply after 1922 and white

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[73]Katz, PhD thesis 390.

[74]Milner complied with this request and therefore included a clause to this effect in the 1904 Transvaal Labour Importation Ordinance (Van der Horst 171).

[75]Katz, PhD thesis 394.

[76]Crush et al. 80-81. The 1907-08 Transvaal Mining Industry Commission received a significant amount of evidence on the ability of African miners to do certain jobs reserved for whites (Van der Horst 175-179). H.L. Phoko, representing the Transvaal Native Congress before the 1907 Mining Commission, argued that the ability of the African miners to keep the mines going during the 1907 white miners' strike proved conclusively that African miners were able to master all aspects of the mining process. The commission did not agree with Phoko (Simons et al., Class and Colour 87).

wages fell, in real terms, by about 20 per cent.[77] The 1926 Mines and Works Amendment Act

> still protected more white jobs than the industry wanted. However, the owners quickly learned to live with it. They had made major savings in the cost of white labour; the new industrial conciliation legislation gave them the assurance of labour peace; the role of the Colour Bar in sustaining an authoritarian system of control had not been weakened. Although sometimes divided, the state, the mines, and the white workers could readily agree that the Africans would pay for the Colour Bar in the forgone wages and lost opportunities".[78]

Nevertheless, the safety issue remained. Thus the 1930 Native Economic Commission, which reported in 1932, argued

> that in certain occupations Natives are necessarily excluded, because it is found that where the safety and health of a number of workers are concerned, a Native is wanting in authority to enforce order...It is argued that however competent a trained Native may be from a purely technical point of view, because he is at present a social inferior on the mines, he has not the influence over the actions of either whites or of other Natives that the white man has and for that reason cannot enforce due observance of the regulations.[79]

A result of the colour bar on the mines had been that, as enshrined in the 1911 Mines and Works Act, the white ganger was responsible for ensuring the work places were safe. However, because of wage structure, "it was in his direct interest to minimize or eliminate the periods when production halted for safety reasons".[80] Furthermore, white gangers were not always in the stope as they spent considerable time underground preparing the explosives. It was thus left to the African "boss-boy", who lacked both formal training and authority, to supervise work and safety.[81] This was a factor in the high incidence of accidents throughout this period, which will be discussed in chapter six.

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[77]Crush et al. 82. Compensation amounts awarded to white miners inflicted with silicosis, or injured by accident, also decreased after the 1922 strike (see chapters five and six of this thesis).

[78]Crush et al. 82. Van Der Horst points out that the decision to pass the 1926 Act was taken "in spite of the fact that the Economic Commission (1914), the Native Grievances Inquiry (1913-14), the Low Grade Mines Commission (1920), and the Mining Industry Board (1922) had all condemned" the colour bar (184).

[79]Report of the Native Economic Commission, 1930-1932, UG22-1932 124.

[80]Crush et al. 99.

[81]Crush et al. 100.

Violence underground

Working underground in dark shafts was often a good place to settle a score. Even more common were the assaults by white miners on their African charges.

> A complaint which is all but universal throughout the mines is that natives are frequently assaulted by Europeans generally underground. A certain number of such cases seem inevitable when the conditions of the work are considered. The mines consist of an enormous mileage of tunnels, in which a number of Europeans, many of them of no high standard of education or ethics, are each in practically unchecked control of several members of a subservient race. As a rule neither the master nor the servant understands the other's language, yet the master has to give directions and the servant to obey them. Both parties are working under unhealthy and unnatural conditions. In these circumstances the temptation to and the opportunity for assaults on the servant by the master are constantly present; and these circumstances may perhaps be modified, but cannot be altogether removed.[82]

According to the Mines and Works Act every assault was meant to be reported. This did not happen, largely because African miners were too scared to report incidents. Failure to prove an assault charge meant the African miner was placed back in the "care" of the white miner whom he had complained about.[83] Furthermore assaults often occurred out of sight of anybody, hence there were no witnesses. Buckle noted that "habitual offenders...take care to strike the native where he is clothed", a practice that led to there being no marks on the plaintiff.[84] In the unlikely event of a white miner being found guilty it did not necessarily mean that he would be dismissed, as the following case illustrates. Davey, a white miner, was charged with "assaulting a native maliciously by putting a quantity of calcium carbide on his face and his eyes." To ensure that the calcium carbide caused maximum damage, Davey held the miner under water, whereupon the required reaction took place, severely burning the African miner's face. In the ensuing court case, it was revealed to the court that Davey on another mine had allegedly "taken a native and ...held his head over one of the latrine tubs and smeared his face with excreta". Davey had then, fearing prosecution, fled to Southern Rhodesia. He was extradited and put on trial, but

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[82]UG37-1914 6-7.

[83]The Director of Native Labour in his annual report of 1911 reported that in 1910 his office investigated 953 cases of ill-treatment of African miners by white miners. In 575 cases he found for the plaintiff. The following year he investigated 787 cases of ill-treatment and he found for the plaintiff in 387 cases (Annual Report of the Native Affairs Department, UG10-1913 43).

[84]UG37-1914 7-8. On the Southern Rhodesian mines van Onselen found a similar reluctance on the part of African miners to complain about assaults. On one particular mine the management fired any African miner who complained to inspectors (Chibaro 69).

was not convicted due to lack of evidence. After the trial Davey found employment on another mine.[85] Duncan has also noted how "beatings of labourers by 'bossboys' and white supervisors were everyday occurrences" especially as the GNLB officials "neither understood" nor were in a position to observe such actions.[86] While the GNLB officials did draw up lists of assaults on labourers by white miners and did record the punishment meted out to the latter, invariably the fines were small and seldom involved dismissal.[87]

Wages and the cost of living

The primary reason why miners put up with the awful conditions of mining was to acquire money. The wages were invariably governed by a contract the miner signed before or on arrival at the mine. The contract also stipulated the number of shifts the miner would complete. While contracts were standard they depended to some extent on how the miner had come to work on that mine and hence the relative bargaining strength of the particular miner. As mentioned earlier, the "volunteer" had a better chance than the recruited miner when it came to deciding the length of the contract. However, most miners worked within a range of between 180 shifts (about eight months) and 270 shifts (about eleven months) per contract. The "volunteer" tended to work around 180 shifts whilst the "recruit" tended to work about 270 shifts. Miners by the 1930s, on average, would return to the mines for six spells of work. Whilst the contract was primarily concerned with the length of service and with the wage the miner was to be paid, reference was also made to the issue of food and accommodation (see chapters three and four). The breaking of the contract was a criminal offence and acts such as the 1911 Native Labour Regulation Act laid down heavy sentences for such an offence. In most cases the miner was sentenced to jail, with the possible addition of heavy labour.

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[85]TA, K358, S. Pritchard's evidence to the NGC, 28 January 1914.

[86]Duncan 17.

[87]Duncan 17. See also van Onselen, Chibaro 70. Moodie records that "stories of black reprisals against white miners circulate freely in the compound" ("Formal and Informal Structure" 564). Presumably there were also fights between black miners underground, as there were in the compounds. However, the archival material does not mention any such skirmishes. It is hoped that an oral history project in the future will shed some light on the one-sided picture that presently exists.

There is a sizeable literature on why Africans required wages. Two principal reasons were, firstly, that Africans were forced to pay taxes to colonial administrations, and secondly, miners required cash to supplement, if not subsidise, their domestic economy. For the purposes of this thesis, the reader needs only to know that the wages that miners acquired for their labour were in the large majority of cases essential for the survival not only of the miner but invariably a number of people at the miner's home. In the period under discussion the wages of African miners did not undergo any significant increase. Lipton argues that African miners' wages remained stagnant "from Union until 1970...In contrast to the wages of white workers, African cash wages, as a proportion of working costs, declined".[88] In fact they failed to keep abreast with the cost of living. According to Wilson prices rose, on average, 50 per cent between 1917 and 1920.[89] The 1922 Mining Industry Board's report noted that in the period 1914 to 1921 African miners' wages increased by thirteen per cent, whilst white miners, over the same period, saw their wages increase by about 50 per cent.[90] Twenty years later the Chamber of Mines defended the low wages they paid to African miners before the Lansdown Commission by arguing that a African miner needed only £28 per annum to meet his family's needs for 14 months plus enough "to keep him in idleness for a further period of twelve months".[91] The commission disagreed with this and argued instead that the miner actually needed £45 per annum, substantially more than most miners received.[92]

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[88]Lipton 120.

[89]Wilson 9. If wages paid in 1936 = 100, than the index of real earnings for African miners, according to Wilson, was as follows: 1911 = 100, 1916 = 90, 1921 = 69, 1926 = 88, 1931 = 91, 1936 = 100, 1941 = 89 (1972, p.46). Hobart Houghton et al. compiled a comparative table to establish the declining purchase power of a sovereign in major cities in South Africa, over the period 1895 to May 1919. Johannesburg figures are only given from 1910 onwards, in which time the sovereign declined from 17s.11d.(1910) to 14s.11d. by May 1919 (for more details see 2: 186-187).

[90]UG39-1922 14. Wilson estimated that the earnings, per year, of African miners were no higher at the beginning of World War Two than they were at the turn of the century. Prior to the South African War the annual wages of black miners had decreased from £39 in 1889 to £29 in 1897. During the South African War they decreased to £18 but rose sharply to £27 after the war as a result of the labour shortages. By 1911 wages reached £28 10s., an amount they were to remain at until 1969, according to Wilson (45-46).

[91]UG21-1944 9.

[92]The commission took into account the fact that between 1939 and 1944 commodity prices increased by 90 per cent (UG21-1944 17-18).

Low wages for African miners were reduced further by the mine owners' reluctance to provide miners with work clothes. Miners were expected to buy their own boots and other items of clothing, at considerable expense. As mentioned above the deeper the mines got the hotter and more humid they became, which in turn meant that most clothing soon became very wet. Miners were thus faced with the difficulty of finding clothing suitable for such conditions. Many photographs of miners at the rock face clearly illustrate how few clothes miners wore. One witness remarked that miners were sometimes seen to be wearing "cotton petticoats and women's vests".[93] A number of photographs taken of miners during the period illustrate how few miners wore boots, which had a devastating effect on their feet as the following example illustrates:

> On one mine the boys said it was so wet underground that they cut their feet going over the rocks and then they walked in the cyanide and got terrible sores on their feet.[94]

By the time of the 1931 Native Economic Commission, the Native Labour Adviser to the Chamber of Mines could still report that miners were encouraged, not compelled, to wear boots. In other areas, though, the underground conditions were being ameliorated. Miners, for example, were being lent oilcloths to wear below to prevent them from getting drenched from the drills and the humidity.[95]

In 1922 the lowest wage was 1s.6d. per day and the average was 2s.2d per day. Drill sharpeners, seen as semi-skilled workers, could earn about 3s. a day. A white miner for the same type of work would earn in the region of 20s. per day.[96] A major obstacle to individual mines increasing bonuses to African miners in an attempt to obtain more work out of the miners was the "maximum average" clause

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[93]TA, K358, evidence of T. Williams to the NGC, 15 October 1913.

[94]TA, K358, evidence of T. Williams to the NGC, 15 October 1913. Boots paid for by the miners, rapidly increased in price in the inter-war period. Prior to World War One they cost about 12s.6d per pair, by 1918 they cost 20s per pair (Johnstone, Class, Race and Gold 189). Lack of boots, or boots in need of repair, exposed the miner to the bloodsucking hookworm (see chapter three).

[95]TA, K26, H.M. Taberer's evidence to the Native Economic Commission, 6 May 1931, 7379-7387. Taberer's evidence does not make it clear why the oilcloths did not cause the miners to sweat even more. Perhaps the cloths had sufficient ventilation to prevent this.

[96]UG39-1922 32. Housing and feeding was seen to be equivalent to an extra 1s. per day. After 180 shifts miners were given a bonus of 5s per month (two days pay). The bonus was continued if the miner returned to that mine within 4 months after ending the initial contract.

in the Schedule of Rates of Native Pay issued by the NRC.[97] The clause stipulated "that the average earnings of all the natives engaged on piecework in shovelling and tramming shall not exceed a given amount, which fluctuates with the percentage of natives employed. For example, if all the natives on shovelling and tramming in a mine are on piecework, their average earnings must not exceed 2s.3d per shift, while if only 20 per cent of them are on piecework and the other 80 per cent on day's pay, the average earnings of the 20 per cent must not exceed 2s.9d. If these average rates were exceeded, the mine may be fined by the controlling authority, which is the Board of the Native Recruiting Corporation, Limited".[98] The NRC enforced this clause to prevent individual mines from offering higher wages and thereby attracting labour from other mines.

While the wage limit was generally binding there were some exceptions. On some mines part of the mining was done by "native contractors", a phenomenon that developed during the reconstruction period. The "native contractor" had under his control a gang of workers whom he would hire out to mines to do piecework. The mines would pay the contractor, who was then responsible for paying the African miners and generally looking after them. It would appear that the "native contractor" became extinct due to the colour bar and was superseded by the "day's pay plus contract" system.[99] The main objection by the white miners to these systems was the large fluctuation in the earnings of contractors, which might range from £200 a month down to £30, or even less. By 1916 the system changed once again and the "no cost contract" was implemented. Stores and labour were provided free to the "contractor", who was paid at a price per unit of work done. Furthermore he was paid a bonus for

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[97]As noted by Lipton, this clause a prevented more efficient and successful mines from outbidding less profitable mines, thus preventing "more efficient companies from maximising profits by raising wages and operating to full capacity"(121). See also Diamond, C.R., "African Labour Problems in the South African Gold Mines with Special Reference to the Strike of 1946," MA thesis, University of Cape Town, 1968, 73-80.

[98]UG39-1922 33. See Appendix A for a schedule of the pay schedule (UG39-1922 46-49).

[99]Under this system "the miner is given a rate per shift, usually 15s, and in addition to this wage he has a contract similar to the 'flat contract' but with a lower unit price, and any profit made under it was added to his day's pay". For an in depth discussion of the "native contractor", see Moroney (Honours dissertation 73-74). One area where piecework rates did remain was in shaft sinking. As time meant money the mine owners wanted the shafts sunk as quickly as possible. They realised that providing incentives would speed up the job (Guy et al. 266-268).

"economy in the use of stores, especially of explosives".[100] African miners who were employed under these "contractors" could, depending on the fair-mindedness of the "contractor", earn as much as 10s. per day for piecework.[101]

Labour Efficiency and Strikes

Perceptions by mine owners and miners differed over what the nature of the job was. Whilst many mine owners continually complained of the inefficiency of the African miners, African miners were occasionally moved to express their concerns through strike action. Driven by the need continually to minimise costs, managers were constantly attempting to use a small labour force to produce more rock for crushing, in other words, attempting to prevent "wastage" of the labour. Evidence before the 1922 Mining Industry Board suggested that the problems of labour supply were that "insufficient attention was paid to its efficiency, and that if an organized effort was made to improve this, there would be no urgent necessity for increasing the present supply".[102]

In the period under discussion African miners generally struck for two main reasons. The first, which will be discussed here, was the issue of wages. The second issue, which will be discussed in the following chapter, was the issue of living conditions. There was a considerable number of work stoppages in the period under discussion, even if they were not officially strikes. These events are even more remarkable because in most cases they were spontaneous reactions to oppressive work situations rather than carefully orchestrated strikes managed by workers' committees. In 1902, for example, on the Geldenhuis Estate Mine 448 Pedi miners struck over the question of the length of the miners' contract. The miners argued that their six month contract was completed. The manager argued that they had a week to go and called in the police, who arrested many of the miners. The miners were

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[100]UG39-1922 16-17.

[101]UG39-1922 33.

[102]UG29-1922 30.

subsequently fined £2 or one month hard labour each.[103]

The first decade of Union witnessed the highest number of strikes in the period between the South African War and World War Two. The decade includes the 1913 strike and ends with the 1920 strike. The latter was arguably the most important strike by African miners before the 1970s. In terms of the 1946 strike, traditionally seen as more important than any previous strike, the 1920 strike "lasted longer, involved more workers both absolutely and in proportion to the work force as a whole", and induced a far greater paralysis of a more sizable number of mines.[104] In his analysis of the strike Bonner argues that any assessment of the 1920 strike requires an examination of the "lengthy period of agitation and struggle" that occurred in the years before the strike. In other words the strike was the culmination of a series of events. Included in his causes was the 1913 strike when 13 000 African miners went on strike. The issues were wages, the status of African miners and violence underground. During the white miners' strike, prior to the African miners' strike, some African miners also struck, but this solidarity on the part of the African miners "had far less to do with working class solidarity than with threats that they would be blown up if they worked with strike breakers".[105] The strike was met by inevitable police and army brutality which soon put an end to it. In response to the strike the Director of NAD argued that

> Having reason to believe that this lead would be followed by certain native agitators, and realising how lamentable it would be were the government to be placed in the position of having to make concessions to natives as a result of demands being formulated in respect of known grievances, the Director recommended that such a move be anticipated and that a commission be appointed.[106]

Two years later, in 1915, on the Van Ryn Deep mine, 2 800 African miners struck. The compound manager, who would listen to neither their general grievances nor their specific complaint about the

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[103]Warwick, P., Black People and the South African War, 1899-1902 (Johannesburg: Ravan Press, 1983) 173. For other examples of strikes by African miners in the reconstruction period see Warwick (172-174).

[104]Bonner, P.L., "The 1920 Black Mineworkers's Strike: A Preliminary Account," in Bozzoli, B., (ed) Labour, Townships and Protest (Johannesburg: Ravan Press, 1979) 274.

[105]Yudelman 103.

[106]Cited in Johnstone, Class, Race and Gold 171. A full discussion of the commission, the Native Grievances Inquiry, and its findings can be found in the following chapter.

length of the hole they were expected to drill before their tickets were marked, was the miners' major target of complaint. After an unsatisfactory meeting with the compound manager they decided to take their complaints to the nearest NRC office, in Johannesburg, as this was what was laid down in their contract. The miners therefore attempted to march to town which the police disallowed, forcing the miners back into the mine compound, whereupon the NAD officials ensured that the mine management addressed the miners' "legitimate grievances".[107]

The 1920 strike began on the East Rand, in the early hours of the morning of 17 February, and soon spread across the Rand. In all it lasted for about 12 days and involved 71 000 African miners on 21 different mines. Production was adversely affected and the Army had to move in to quell it.[108] Once again low wages, and the "opportunity to do more responsible and better paid work" were the key issues.[109] However the situation was further aggravated by two other factors. Firstly, the dramatic increase in the cost of living in the period immediately after the war had drastically reduced the buying power of the African miners' wages.[110] Secondly, the number of serious droughts that occurred in several rural areas in Southern Africa had made it even more difficult for the miners' families to make ends meet. Furthermore the strike occurred within a context of urban unrest which had begun two years before when miners had engaged in a boycott of the trade stores (see chapter four). Other workers, in the urban areas, principally the "bucket-boys", had already shown their displeasure at inflationary prices

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[107]See Simons et al., Class and Colour 188 for more details.

[108]See Callinicos, 1: 93-96. See also Johnstone, Class, Race and Gold 176-184; Diamond 42-53; for details of the 1920 black miners strike. According to Diamond white miners were paid throughout the strike, even though production was halted on the mines. African miners were only housed and fed and they lost, in total, an estimated £20 575 in wages (48).

[109]Simons et al. 231-233.

[110]A further example of the rise in the cost of living (see above for other examples) is the following: "Before the war a sufficient outfit - two cotton blankets, a shirt or sweater and a loin cloth - cost 18s. while the same articles cost 38s. by 1918. As he required a minimum of two sets of this outfit each year, the additional expense to the Portuguese African was, by 1918, forty shillings over pre-war prices. The cost of living increase...was thus more than 100 per cent" (Diamond 72).

and low wages in their 1919 strike.[111] Miners would have been exposed to this unrest during their sojourns in the townships. Undoubtedly they returned to the mines with more militant ideas, which ultimately crystallised into the 1920 strike.[112]

The minimum wage demanded by the African miners during this strike was 3s. per day. Had this been implemented it would have increased the wage bill by £8 000 000 per annum and, at the 1920 gold price, 23 mining companies would have had to close.[113] This statistic also highlights how the industry was more dependent on the cheapness of its labour than on the actual richness of the ore.

The strike is significant for a number of reasons. Firstly, despite the NGC's recommendations about compound control, which the mines had obviously not yet fully implemented, workers were still able to communicate, initially, with other mines and organise a major strike. Secondly, the compound system, based on the principle of control, nevertheless provided an effective tool in breaking the strike.[114] Thirdly, it is significant that non-miners had some influence on the mines. The Transvaal Native Conference, for example, met with about 2 500 miners, most of whom were "house and shop 'boys'".[115] Fourthly, unlike the 1922 strike, the African miners were remarkably patient and self

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[111]For more details of more subtle causes see Bonner 273-297. Of particular interest is Bonner's assertion that the changing nature of the type of miner was a factor in the strike. In other words, the growing proportion of voluntary labour as opposed to recruited labour was an indication of the miners "commitment" to the mines - a feeling that may have subsequently led to much resentment among African miners towards the colour bar (281-282).

[112]Bonner 282. Howard Phillips argues that the Spanish Influenza epidemic "aggravated the already serious shortage of black workers. As such it intensified the greater profitability crisis facing the mines, a crisis which was ultimately to lead to the Rand Revolt of 1922" (7). Presumably if this is true then it is possible to argue that the 1920 strike was also influenced by the epidemic.

[113]Johnstone, Class, Race and Gold 182.

[114]Police surrounded the compounds, and prevented groups of miners from leaving. Where necessary they either baton charged or shot at miners to prevent them from leaving. Communication was therefore within the first few days cut off between mines (Diamond 49). The effectiveness of compound control was in evidence as the strike "was broken by a simple device. A police cordon was drawn round every compound. Each group of Africans thus isolated was told that all the rest had gone to work. In the absence of an African miners' union...this method eventually succeeded, though not without bloodshed" (Roux, E., Time Longer Than Rope [Madison: University of Wisconsin Press, 1964] 132).

[115]Diamond 43. Apparently the International Socialist League issued a pamphlet calling on white workers not to "scab" on the African miners (Diamond 46).

restrained.[116] However, there were some pitched battles: on the Village Deep mine police shot three miners and wounded thirty five after African miners attacked and wounded about a dozen policemen.[117] In the aftermath of the strike three African miners were prosecuted for allegedly threatening the Langlaagte compound manager. In the subsequent trial the issue that upset the magistrate most about the action of the miners was that they had tried "to ape the white man by going on strike". Thus the miners, branded as mimics, were each sentenced to a month in prison despite the fact that the original charge of intimidation was not proved. The miners had already spent five months in jail awaiting trial.[118] While African miners did not strike in sympathy with white miners in 1922 the strike obviously had an impact on African miners. Not only did white and African labour ratios change underground, possibly for the better as far as African miners were concerned, but importantly "mine managers were once again made virtual dictators and were encouraged to take whatever steps were necessary to cut costs". [119]

The fact that there were no more strikes among African miners after 1920 was the result of a number of reasons. Firstly, store prices did gradually drop, thus deflating some of the miners' militancy. Secondly, the growing distress in the reserves and the shortage of jobs in other sectors created something of a labour surplus. Therefore the Chamber could either replace militant labour or threaten militant miners with unemployment if there was any labour unrest.[120] Thirdly, as will be discussed in the following chapter, the levels of control, as recommended by the Buckle Commission, were in place and strikes became increasingly difficult to organise. The next strike occurred 26 years later. Wilmot James in his discussion of the 1946 African miners' strike notes that the post-war profitability crises for gold mines, which led to the mines rationalizing, reducing food rations and any increase in wages,

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[116]The Star (24 February 1920) remarked on the fact that the miners "on the whole have been quiet and amenable...probably much more so than the European strikers in similar circumstances", cited in Diamond 44.

[117]Diamond 44-45.

[118]Simons et al., Class and Colour 233. Yudelman notes that 11 miners were killed and 120 injured during the 1920 strike (144).

[119]Yudelman 190-193.

[120]Bonner 289.

establishing "more disciplined supervision" and greater mechanisation, resulted in the strike.[121]

Conclusion

Once recruited, miners were exposed to a number of factors that had a detrimental effect on their health. Foremost amongst those factors was the workplace, in which the possibility of death was always present. The gruelling work that miners were expected to complete each day was aggravated by what the miner returned to at the end of each shift. The following two chapters examine the conditions under which miners lived whilst working within this system and the effect this system had on their health.

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[121]James, W.G., "Grounds for a Strike: South African Gold Mining in the 1940s," African Economic History 16 (1987): 1-22. See also Moodie, T.D., "The Moral Economy of the Black Miners' Strike of 1946," Journal of Southern African Studies, 13 (October 1986): 1-35. Interestingly the issue of workers' supervision had been taken up in 1936 when four gold mines introduced "underground native checkers" to monitor the work of African miners, their job being to "visit each working place in the section and check the gang, job number and class of work" of every African miner in their section (James, "Grounds for a Strike" 9). African miners were to come to deeply resent these "checkers", not only because of the power of the checker when it came to marking tickets and allocating jobs but also from the safety point of view (see Jean Patrick Leger's forthcoming PhD thesis for details).

Chapter Three

"Even a horse gets the day off": The Changing Nature of the Mine Compound

> If he wants an occasional day off he often cannot get it. Even a horse gets that in good hands: why not a African man ?[1]

In an attempt to understand why mine owners opted for compounds, which involves an understanding of the paternalistic discourse which helped to determine the forces that shaped compound development, the compound will be compared with the Benthamite concept of a panopticon on account of similarities which suggest themselves. Foucault in his examination of the functions of prisons and hospitals, as well as other institutions, utilises Jeremy Bentham's prototype of the perfect prison - the panopticon - as a model.[2] The panopticon, much like the ideal compound,

> through spatial ordering, ...brings together power, control of the body, control of groups and knowledge... [and] locates individuals in space, in a hierarchical and efficiently visible organisation.[3]

Very similar in concept to the Kimberley closed compound, the panopticon was an ideal that compound architects strove for, but never truly achieved. Although Foucault declared that the panopticon is only a "diagram of a mechanism of power reduced to the ideal form", the concept can be effectively used in exploring the formation of formal compounds on the gold mines.[4]

In the case of the mines a central role of the compound was to prevent any form of desertion. The panopticon, which may have been a symbolic prison, also symbolized the control desired by mine managers. The closest that the industry got to this model was the City Deep Compound, as the following

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[1]"A New Delight: The Labour Grievances," Rand Daily Mail 2 July 1914.

[2]The panopticon came in many different shapes and sizes. Apart from the classical model of Bentham's there were also quadrants, the "cross plan" and the star shape. The "Old" Provost, in Grahamstown, is a good example of a quadrant-shaped panopticon.

[3]Rabinow, P., The Foucault Reader (London: Peregrine Books, 1987) 18-23.

[4]Foucault, M., Discipline and Punish (1979) 205 as quoted in Rabinow 18-23. Foucault has argued in Discipline and Punish that the panopticon ensured not only efficiency but normalization as well. Therefore the majority of the people within this system would adhere to the "norm". Rabinow argues that within the structure of Foucault's use of the panopticon, there is a technology which ensures discipline by organising individuals within a "specific enclosure of space". Discipline in turn facilitates productivity (Rabinow 17).

discussion illustrates:

> Buckle: You say that the compound must be suitably constructed to contain the natives and you know of no better attempt at this than the City Deep Compound. What are the points about that compound especially?
> Police: It is surrounded first of all by a high galvanised iron fence. It has barbed wire at the top which prevents anybody getting in or out. Further than that there is a construction by which goods can be hauled up from the outside from trollies. The trollies can be brought up alongside and cranes erected so that stuff can be brought over from the trolley into the compound.
> Buckle: Without opening the gates?
> Police: Yes without opening the gates at all. The gates are so constructed that they have turnstiles by which each native can file in singly. The buildings are so constructed that from the compound manager's office he can see down any direction along the line of huts.
> Buckle: The buildings are arranged like the spoke of a wheel with the office as a hub?
> Police: Yes, by that means they are able to see exactly what goes on in the compound and practically almost in the rooms.[5]

The issue of control was no doubt a crucial one and will be highlighted in the following pages. Yet notice must also be taken of other factors that influenced compound construction, especially the role played by the African miners themselves and health authorities. Given that there was a general tendency in the mining houses to ignore many of the regulations governing the construction and maintenance of compounds, the fact that there was any change at all, and the nature of the changes which took place, both stand in need of explanation. After all it would appear that the concept of the panopticon, while desired by management, was never truly achieved in the period after Reconstruction.[6] Clearly opposing forces had shaped the compound differently.

Early Accommodation

Given that the development of the Witwatersrand Gold Mines occurred against the backdrop of a struggling Boer Republic coming to terms with the vast wealth recently discovered in its back garden, one cannot be surprised that the early compound development was erratically planned.[7] Town planning was still in its infancy and a haphazard approach to African miners' accommodation developed. Miners were housed in locations adjacent to the mines, in tents or in iron or wooden shacks on the mine

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[5]TA, K358, evidence of the Police District Commissioner for Johannesburg, to the NGC, 6 March 1914.

[6]As outlined in the first chapter, the Reconstruction era in the Transvaal was the period from c.1902 to 1907.

[7]This lack of town planning in the early days was despite the precedent set in the development of Kimberley some years before the Rand was developed.

property.[8] These dwellings were the forerunners of the early compounds. In some instances the huts were "built back to back, in order to share walls and thereby reduce costs. Floors were soil or antheap...most sleeping bunks were of wood and constructed by the inmates themselves, which tended to aggravate overcrowding".[9] By the end of the South African War very few mines actually had compounds, since mines had preferred not to incur the expense of constructing them. But this quickly changed in the immediate post-war period as mine owners began to appreciate the benefits of offering miners ready-built accommodation.

The Mining Compound in the Reconstruction Era

After the end of the war the housing situation was aggravated by the destruction of the temporary forms of dwelling built during the war. In part it was because of the housing shortages that there was a shift from informal housing to the creation of more formal compounds on the mines in the Reconstruction era.[10] However, several other factors also influenced this shift to formal housing. The development of the closed compound on the Kimberley diamond mines clearly influenced the gold mining industry, especially as mine owners organised a private tour of the Kimberley compounds in March 1903 to assess their suitability for accommodating African gold miners.[11] Historians have tended to distinguish between the closed compound, first built by De Beers in Kimberley, and modelled on De Beers' convict station, and that built by the gold mine owners on the basis that the former had been designed to prevent theft, a problem not as common on the gold mines. There were however some crucial differences between the Kimberley model and the one that evolved on the gold mines. Firstly, the former

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[8]Callinicos 1: 43 The shacks were often "low roofed ...without windows or ventilation worth mentioning...In the large majority of cases the occupant knocked together a few pieces of wood and made himself a rough bed to sleep on" (Dr Sansom, Commissioner of Native Affairs, quoted in the 1906 Transvaal Public Health Department's Annual Report, TG 10-1906).

[9]McNamara, J.K., "Migration Routes to the Gold Mines and Compound Accomodation, 1889-1912," South African Labour Bulletin 4 (May 1978): 27.

[10]See van Onselen 1: 24-37 for details.

[11]For a discussion on the origins of the compound system in southern Africa see van Onselen, Chibaro 128-132. See also Turrell, especially chapter 8 - "The Closed Compound System" (146-173). According to Maynard Swanson the Durban municipal compounds are variants of this theme. Today much of the township violence revolves around compounds that still exist in those areas.

invariably ensured that the miners were unable to leave the compound for the duration of the miner's contract, whilst gold miners were usually free to visit the surrounding areas when they were not required to work. Secondly, diamond miners had to buy and cook food for themselves whereas, as will be discussed in chapter four, gold miners were provided with most of their meals. Finally, compounds on the diamond mines housed a "reserve pool of labour" waiting to be given work, while on the gold mines all the males in the compound were engaged in some form of mining activity.[12] However, Turrell in his recent examination of the closed compound system in Kimberley convincingly argues that the development of such a system should be seen rather as an "integral part of the development of underground mining".[13] In other words, as diamond mining was transformed from open cast mining to deep level mining it required "a fundamental change in the social organization of production and, in particular, in the exercise of authority and supervision in the work-place".[14] Workers confined to the compound were therefore, by analogy with the aim of the panopticon, more easily controlled. In chapter one it was shown how the health authorities' concern about the spreading of the 1904 bubonic plague influenced them to encourage the mines to build better accommodation for their work force. Finally, as will be discussed later, efforts to control activities such as crime, prostitution and alcohol also influenced the establishment of compounds.

In 1903 Lagden, Commissioner of Native Affairs in the Milner "cabinet" in 1903, appointed a committee of medical specialists and Native Affairs Department (NAD) officials to investigate compound conditions and make recommendations for improvements. Despite much debate the committee never satisfactorily resolved the connected issues of room size and numbers to be accommodated. The majority of the committee wanted 200 cubic feet per miner, whereas the minority wanted 300 cubic feet. The latter's objection was based on regulations that applied to the "common

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[12]Turrell 171.

[13]Turrell 147.

[14]Turrell 149. Importantly Turrell does stress that the closed compound was not a "totalitarian institution" as a number of compound managers provided inducements, for example free liquor, to entice African miners to work on specific mines. Within the first decade of the appearance of the closed compound on the diamond mines all the miners were being accommodated in these structures.

lodging houses " in Britain. The mining houses balked at this suggestion as they estimated that it would cost the mines an extra £250 000 to implement. The Committee's report led to the passing of the 1905 Coloured Labourers Health Regulation Ordinance in the Transvaal. The Ordinance stipulated that the average mine hut should hold twenty seven miners, with no less then 200 cubic feet of air space per miner. Windows were to be glazed, floors were to be impervious and ventilation holes were to be built into the walls. Furthermore, the compound was to be inspected daily "and all sick boys [to] be immediately removed in order to secure that the compound huts shall contain none but healthy boys".[15] Ill miners were sent to sick bays, which some mines had constructed as the result of a recommendation from the 1903 committee.[16]

Few of the regulations were adhered to. In June, 1909, for example, forty-two mines had not complied with the regulations governing air space.[17] Conditions generally had also not improved. After an inspection of compounds in 1910, Sir Arthur Sharpe wrote to the Secretary of State for the colonies that

> the compound I saw at Johannesburg was badly drained, the refuse of food cauldrons lay about, the smell was distinctly objectionable, and the general impression I gathered from seeing this one compound was that much more might be done on the Rand to ameliorate the conditions of the tropical natives working there.[18]

The passing of the Ordinance was also meant to facilitate the process whereby mining companies had to submit their plans for approval before the compounds were built. However, this did not always happen. In 1910, for example, the Randfontein Mine's compound was completed except for the roof before its

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[15]COMAR, (1904) 26-40

[16]Before the South African War the majority of the mines made no provision for the ill health of their workers. The mines sent their ill to the central hospital in Johannesburg. To finance this service the mines taxed each miner 1s. per month, which was then given to the hospital. However, some mines began to build sick bays in the late 1890s as Deep Level mining was developed. As mentioned previously accident rates are more common with this type of mining than with outcrop mining. More accidents encouraged the mines to try to treat the victims on site rather than transport them to a hospital which was, in some cases, many miles away (Fourie, J.J., Die Koms van die Bantoe na die Rand en Hulle Posisie Aldaar, 1886-1899 Archives Year Book for South African History Series 41.1 [Pretoria: Government Printer, 1979] 226-258). This system was comparable to the one used in Kimberley, where African miners were required to pay 12s. per year for medical care (Turrell 162).

[17]Moroney, Honours dissertation 62-67.

[18]Sir A. Sharpe to Secretary of State for the Colonies, 9 May 1910 (COMAR, [1910] 26).

owners submitted their plans. At that point the NAD inspectors identified several problems with the design, but they then felt unable to do anything about the compound and it was allowed to be completed in a defective manner.[19]

Some months after the 1903 NAD committee report had been published the Chamber of Mines was asked to establish whether or not the mining companies were putting the committee's recommendations into operation. The Chamber had in fact already begun ascertaining what the situation on the various mines was. Part of this process was achieved by sending out a questionnaire, to which 76 mines replied. The results can be tabulated as follows:[20]

A. Above Ground Sanitation	%	B. Below Ground Sanitation	%
1 Bucket system present	85.5	1.Bucket system present	75.0
2.Did not provide	9.2	2.Did not provide	19.7
3. No response	5.3	3.No response	5.3
B. Compound Floor Types		D. Bunks	
1.Earth/ Cow dung	31.6	1.Cement	15.6
2.Cement	30.1	2.Wood & Iron	13.4
3.Asphalt	21.1	3.No bunks	1.0
4.No response	17.2	4.No response	70.0
E. Stoves		F. Hospitals	
1.Recommended Stove & Chimney	1.3	1.Mines with sickbays	50.0
2.Recommended Stove	7.9	2.Mines with fitted hospitals	12.0
3.Bucket Stove	9.2	3.No provision for health care	14.0
4.Open Fire	1.3	4.No response	24.0
5.No Stove only steam	2.6	G. Doctors	
6.Introducing Recommendations	57.6	1.Mine had part-time MO	36.0
7.Refuse to implement	14.5	2.Only had African orderlies	35.0
8. No response	5.3	3.Only had white orderlies	14.0
		4.No orderlies	2.0
		5.African and white orderlies	13.0

Table 1: Responses to Questionnaire Issued by the Chamber of Mines

From the above one can ascertain a number of valuable points. Firstly, the majority of the mines used

[19]TAB, GNLB, 5 71/10, letter to acting assistant director of NAD from Dr G. Cooke, MOH, 2 March 1910.

[20]COMAR, (1904) 26-40.

the bucket system for sewerage purposes. Secondly, a third of the compounds had earth or dung floors.[21] Thirdly, one notes that on the question of bunks, 70 per cent of the mines did not reply.[22] Fourthly, the stoves that were recommended were not only provided for warmth and cooking purposes but they were also intended to play a crucial role in hut ventilation.[23] Fifth, the above illustrates how few mines were medically equipped to deal with either accidents or diseases. Sixth, the answers clearly show that in many respects the mines were very different. Some evidently made a better attempt to observe the regulations than others. This is important in that it highlights the dangers of over-generalizing when discussing compound conditions.

The bucket system was developed during the Reconstruction period and remained popular with mine owners until World War Two. Only the Corner House group utilised waterborne sewerage from about the time of World War One. Other mining groups began using waterborne sewerage in the 1930s. Waterborne sewerage was apparently unpopular with mine owners, not only because of the enormous expense of constructing suitable drains, but because there was a shortage of water on the Witwatersrand and a shortage of land for sewerage disposal. The mining houses, which necessarily used water for allaying dust during their drilling operations, may have had a case in arguing that waterborne sewerage would have drawn too heavily on their water resources. The efficiency of the pail system depended "entirely on proper scavenging arrangements and efficient sanitary supervision".[24] In other words, the

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[21]These floors commonly became mud-baths after the summer thunderstorms. There are traditional cultural reasons why rural African huts had mud floors which were usually consolidated with cow dung. However, where dung was not used those mud floors became very dusty when dry. The fact that the floors became muddy indicates that water was getting in either through leaks in the roof or through the doors and windows, all of which could have been prevented in one way or the other.

[22]One possible conclusion is that the mines did not reply because they did not have anything to reply about. In other words compounds did not have bunks, hence the miners would have slept on the floor, an unattractive proposition if there was a one in three chance of the floor becoming muddy in summer. Those mines that did build concrete bunks, in fact really built concrete shelves.

[23]The stoves in the compound rooms were designed to draw fresh air in through the ventilation holes embedded in the walls. Before the stoves were introduced the majority of the compound rooms had braziers or open fireplaces. The ventilation holes, however, were unpopular. The holes, each one foot square, often let in a howling wind which the miners found extremely uncomfortable. Rough cloths were used by the miners for blocking up the ventilation holes.

[24]TAB, GNLB, 137 2829/13, letter from MO of NAD to the Director of Government Native Labour Bureau, 11 March 1918.

pails had to be emptied once a day to be at all effective. Refuse removal, an important component of any sanitation system, was initially hapazardly enforced. Descriptions of mine rubbish dumps at the turn of the century indicate "that the surface mining environment was made unnecessarily unhygienic. The dumps, usually in the vicinity of compounds, were not properly controlled or maintained," while "heaps of rubbish and refuse were to be seen in the neighbourhood of every compound".[25] Washing facilities were often not provided for the African miners. Where they were provided they were often outside and often only had a cold water supply.[26]

Sanitation was important in that its absence led to a wide variety of infections. Dysentery and typhoid were especially common in the Reconstruction period as a result of the impure drinking water. Between 1902 and 1905 the former accounted for twenty per cent of the deaths on the mines. Although it was eventually eradicated, typhoid continued to kill miners into the 1930s.[27] Even the Central Mining-Rand Mines Group (Corner House), which had waterborne sewerage, had an incidence of about three cases of enteric fever per 1 000 miners employed in the period 1918 to 1935.[28] A further motivating factor for waterborne sewerage was the discovery in 1912 of hookworm on the mines. Endemic amongst tropicals and "East Coasters" (one in every four was infected), and transported in faeces, the worms were thought not to pose any danger. Not until 1926 when five white miners were infected did the mines do anything about it. The mines examined the soil surrounding the latrines and drinking water containers and found

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[25]Baker 152. A state inspector of mines recorded in 1913 that the majority of the mines he inspected had insufficient latrines and urinals. The latter were often simply holes in the ground, untarred and usually filled with sawdust to absorb the urine. Furthermore, the same inspector found many compounds dotted with stagnant pools of water, the result of a complete absence of storm water drains in these compounds (COMA, reports compiled by R. Beattie, inspector of mines for the Union. Examples were taken from reports dated 18 June 1913, 3 July 1913 and 30 August 1913).

[26]See photographs of baths in Kallaway et al. 24-25. By the 1930s the mines were compelled to provide one shower head for each 100 miners employed (Orenstein, A.J., Notes on Elementary Hygiene, etc., for Compound Officials [Johannesburg: Central Mining/ Rand Mines Group, n.d.] 25).

[27]Baker 140-141.

[28]Orenstein, A.J. "Report for the Year 1935," (Johannesburg: Health Department, Central Mining - Rand Mines Group, 1935) 9. Enteric Fever was usually some type of enteritis, which resulted in diarrhoea and vomiting. Normally it was not fatal, provided care was taken of the patient. The prescribed treatment included drinking large amounts of liquid.

it to be heavily infested with the worms.[29] Preventative measures, such as increasing the number of latrines, were duly introduced and white miners who became infected received monetary compensation.

The introduction of the concrete bunk was not well received by the miners.[30] Not only was it a cold surface but it was also very hard and consequently extremely uncomfortable. Mine management justified the use of concrete bunks by arguing that they were much easier to clean than, for example, wooden bunks. Furthermore, they mistakenly argued that "at his kraal the Native sleeps on the earth, which is colder than cement".[31] Miners would create very rough mattresses out of old clothes or dry grass.[32] While the mine officials, as far as one can tell from the evidence available, were not overly concerned about the use of these rough mattresses, they were concerned about the use of the "mcheka". The "mcheka" was an old cloth or hanging that the miners would hang in front of their bunks for privacy, which had been outlawed in the 1904 ordinance but was still in evidence in the 1920s. The mine officials had two objections to its use. Firstly, it was seen to be unhygienic, and was thought to contribute to keeping the compounds dirty. Secondly, it was "closely associated with immoral practices" that occurred in the compounds. The "mcheka" was a common feature in the compounds until 1928 when Dr Cluver, assistant MOH for the Union, began to wage war on its use. He urged the compound managers to remove them as they were illegal. Mine managers were at first reluctant to remove them as

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[29]Fischer, W.O., & Orenstein, A.J., "Hookworm Infection in the Gold Mines of the Witwatersrand," Journal of the Medical Association of South Africa 1 (April, 1927): 157-163. The worms were transported in the water that seeped into miners' boots. The worms then literally bored through the skin into the body and attached themselves to the lining of the small intestine where they sucked the "host's" blood. The result was anaemia and swollen limbs. These symptoms became more common amongst the workforce as the mines went deeper, as the high temperatures underground were ideal breeding conditions for the worms. Hookworm infection statistics are difficult to come by as only records of white miners were kept for compensation purposes. Records were not kept for African miners as officials saw it as endemic and were financially reluctant to embark on any mass campaigns to reduce the disease.

[30]The plans of such a compound room, fitted with the concrete shelving, can be seen in Appendix B. These show that the bunks were not completely separated from each other and that there were two layers of shelving, the one upon the other. The bird's eye view of the compound room obviously only shows 20 bunks in each room, but below, as shown in the cross section, were another 20 bunks.

[31]Evidence of the Gold Producers' Committee of the Transvaal Chamber of Mines to the Native Laws Commission of Enquiry, Statement No.5, in Statements of Evidence 30-33.

[32]COMA, evidence of D.M. Denalane, Induna on Robinson Deep Mine, to the Native Mine Wage Commission, 8 June 1943.

they felt it would make the mine more unpopular. By 1930, however, the managers had carried this out and the "mcheka" was forbidden.[33]

The 1903 survey had also found that no mine had a full-time doctor - a third of the mines were visited regularly by a doctor and the remainder summoned doctors only in emergencies. Only fifty per cent of the gold mines had sick bays, the daily medical supervision of which was carried out by attendants who had no formal medical training whatsoever. However, partly as a result of the Chinese arriving to work on the mines and partly as a result of the high African mortality rate on the mines, a number of mines began to make an effort to improve the health care they provided. Another internal enquiry was undertaken by the Chamber in 1906 to establish the "hospital provision made by the mines for the natives". The questionnaire sent to each of the mines found that the industry as a whole provided 3 181 hospital beds for 66 253 African miners. Furthermore, in 1906 the "hospitals" had treated 62 266 cases of which only 145 had been referred to Johannesburg's hospital.[34] The fact that the mine "hospitals" were seemingly coping with the bulk of the patients enabled the industry to convince the government temporarily that the mines' health system was suitably equipped to handle most medical problems.[35]

Married Quarters

There were some exceptions to the panopticon concept. One such exception, "mine married quarters", appeared after the destruction of the informal locations on the mine properties.[36] On some mines a

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[33]SAB, GES, 904 598/13 E.H. Cluver, assistant MOH for the Union, to secretary for Public Health, 30 November 1928. Also letter from Cluver to secretary for Public Health, 2 April 1930, (GES, 904 598/13).

[34]COMA, information included in a letter from Rand Provisional Joint Health Committee to the secretary of the Transvaal Chamber of Mines, 12 November 1906.

[35]Letter from Rand Provisional Joint Health Committee to the secretary of the Transvaal Chamber of Mines, 12 November 1906, COMA.

[36]In 1908 there were still about 2 760 miners in informal locations, especially evident on the outcrop mines because these mines had a limited life and their owners were reluctant to spend great sums of money on the construction of permanent compounds. However, between 1908 and 1911 this type of accommodation was destroyed by the State as it was convinced that these locations were dens of iniquity in which prostitution and illegal liquor brewing were said to be rife (Moroney, S., "Mine Married Quarters," in Marks, S., & Rathbone, R., (eds) Industrialisation and Social Change in S A [London: Longman, 1982] 260-262).

small proportion of the African miners could live with their families in married quarters.[37] However, even these had a system of control. According to Moroney, the

> basic provisions contained in the regulations for married quarters required that a high fence or wall be erected around the quarters with only one entrance; supervision was to be by a white superintendent responsible to management; a register of all residents was to be kept, and only bona fide mineworkers and their families (children under 14) were to be allowed residence.[38]

Mine married quarters were either rented or free of charge. They varied in number, for example, there were fifteen on the Robinson Deep Mine whereas the East Rand Property Mines (ERPM) had 1207. It is not entirely clear how miners qualified for these quarters. What can be ascertained is that miners were able to acquire these quarters if they had the better jobs, usually as Indunas (compound "chief") and clerks on the mine, and were in virtual permanent employment with that mine, thus being able to renew their contracts without leaving the mine.[39] Most mining companies provided a few married quarters as part of the compounds they built after the South African War. By 1914 fifty-three mines had married quarters which housed 11 848 people. The following year forty seven mines had such quarters which housed 10 587 people.[40] It is difficult to ascertain what occurred after 1918 as little evidence has so far been found on the subject.[41]

The NAD had to approve all construction work undertaken in the mine compounds and was therefore in

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[37]Gordon found on mines in Namibia that African miners particularly resented the fact that white miners were allowed to live with their wives on the mine property whilst they could not (94). Undoubtedly, the same resentment was felt by African miners on the gold mines. In Southern Rhodesia, according to van Onselen, a high proportion of miners were able to live with their families on the mines (Chibaro 134).

[38]Moroney, "Mine Married Quarters," 264.

[39]The Report of the Witwatersrand Mine Natives' Wages Commission on the Remuneration and Conditions of Employment of Natives at Transvaal Undertakings of Victoria Falls and Transvaal Power Company, Ltd., UG 21-1944 30, notes that married quarters are usually provided "rent free" for married clerks and Indunas.

[40]According to Moroney there was evidence of tension between compound and married quarters dwellers over the latter's privileged position (Moroney, "Mine Married Quarters" 265-271).

[41]Jeppe, in 1943, recorded that "about one per cent. of mine natives lived with their families in locations" (Jeppe, C. B. Gold Mining on the Witwatersrand 2 vols. [Johannesburg: Transvaal Chamber of Mines, 1946] 2: 1758). Van der Horst was of the opinion that the number of miners being housed in married quarters may have decreased by the 1930s. She cites a figure of 1 474 miners, out of a total workforce of about 200 000 African mine workers, being housed in these quarters (1942 187).

a powerful position to block the construction of more married quarters.[42] Thus the NAD, which was reluctant to enlarge the class of permanent workers on the mines, might possibly have vetoed any large scale attempts by the industry to construct such quarters.[43] However it was never called upon to implement this policy as the enormous cost of building such dwellings and the mines' claim that they did not have sufficient land meant the number of such quarters remained small.[44]

Interestingly some of the women who lived on the mines were not miners' wives. Examples can be found of "women posing as wives and making a living out of liquor brewing and prostitution".[45] This phenomenon was probably tolerated by the mine companies as it kept the miners happy at no real expense to themselves.

Hierarchy of Control

It was during the Reconstruction period, with the development of formal compounds, that a hierarchy of control developed on the mines.[46] This was necessary to ensure that the compounds were utilised for what they were built for. In charge of both the compound and the work place was the compound manager, whom Moroney sees as crucial to an understanding of the compound system, since "it was the compound manager who set the entire atmosphere in the mine".[47] Managers would have endorsed

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[42]Van der Horst 189.

[43]The NAD used this veto for the first time in 1952, when they prohibited Anglo-American from building such quarters in the new Orange Free State gold mines (Gregory, T. Ernest Oppenheimer and the Economic Development of Southern Africa [London: Oxford University Press, 1962] 573-581).

[44]TA, K26, evidence of H.M. Taberer, Native Labour Advisor to Chamber of Mines, to the Native Economic Commission, 6 May 1931, 7379-7387. According to the Lansdown Commission some "permanent" miners (clerks) had to rent rooms in the locations precisely because the mines did not have adequate accommodation (UG21-1944 6). It was this continuing contact between compound and location that, according to Phil Bonner, was a cause of a good deal of urban unrest (273-297).

[45]Moroney, "Mine Married Quarters" 264

[46]For a useful discussion of present day social structures on the gold mines see Moodie's "Formal and Informal Social Structure" 555-574. Although this system clearly evolved over time it is not made clear by the author when the system he discusses came into operation. Photographs suggest that Indunas and mine police were in place by the turn of the century (Kallaway et al. 24-25).

[47]Moroney, Honours dissertation 42

Moroney's view, as they saw themselves "as the supreme figure of authority...a 'Chief' or 'father' (ababa wetu) of all African workers".[48] Gordon found in Namibia that the compound manager was similarly important. Moreover, he found that managers were not chosen for personnel or scholastic qualifications, but because of their "'expert knowledge' and proclaimed ability to work with Africans. It is this mystification of 'practical knowledge' which justifies the Compound Manager's senior position...The Compound Manager 'knows' Africans on the basis of how they act".[49] The Chamber of Mines, on the recommendation of the MMOA, attempted to convince mine managers to undergo some training in compound sanitation and hygiene. The MMOA felt this training was necessary as they had found that "the compound manager appears to consider that his policing duties are much more important than sanitary supervision".[50] However the Chamber had no way of enforcing this recommendation and the training scheme was never begun.

Many African miners, realizing the importance of the manager's role in the compound, nicknamed the individual mines after the manager. For example, the Primrose Mine was called Sinquanqua - "fierce temper"; the Meyer and Charlton Mine was called Mahleka - "one who laughs".[51] In most instances on the mines the white gangers only knew "their boys" by their mine numbers and vice versa.[52]

Van Onselen has identified an important feature of white management on the mines, namely its "quasi-military" characteristics. As in Southern Rhodesia "the expertise in organisation and control of men

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[48]McNamara, J.K., "Brothers and Work Mates: Home Friend Networks in the Social Life of Black Migrant Workers in a Gold Mine Hostel," in Mayer, P., (ed) Black Villagers in an Industrial Society. (Cape Town: Oxford University Press, 1980) 305-340.

[49]Gordon 86. Gordon observed that during leisure hours the dominant topic of conservation amongst white supervisors "is the performance of their 'boys' on the mine" (66). An essential ingredient of this 'knowledge' would have been the ability of the manager to speak Fanakolo. In Namibia the African miners felt that this language served "to stress and maintain an inferior position" which was a major cause of misunderstandings with white authorities (Gordon 95).

[50]MMOAA, minutes of the MMOA, 25 April 1928.

[51]Moroney, Honours dissertation 42. McNamara records that some compound managers were nicknamed "Mabulal' ehleka" - one who kills you while laughing ("Brothers and Work Mates" 309).

[52]Gordon found the same thing in Namibia, which led him to conclude that "the image of the 'other' obtained in such institutions is naturally not conducive to sympathetic identification"(67).

which these men had gained in the army could be put to good use in a labour intensive industry" like gold mining in South Africa.[53] In fact many of the compound managers and mine medical officers had military backgrounds.[54] The best example of this was Dr A.J. Orenstein, who was the Rand Mines Limited's Superintendent of Sanitation from 1914 until 1956. At the time of his appointment he was an American Army doctor and later served in the South African Army, rising to the rank of Major-General. Below, the work of Colonel Gorgas will also be discussed.[55] Not only did the structures of social control resemble a military organisation but the discourse on the mine also reflected a reliance on military idiom. Van Onselen has drawn attention to the military terminology used on the mines, including "labour was recruited", "labour deserted", miners were sometimes placed in "detention barracks", miners were "paraded" before doctors.[56] Despite the military discourse miners were treated more like children than soldiers, especially as the compound system, according to Bozzoli, "required and bred an idea of the African man as a child, irresponsible and uncontrollable".[57]

The manager could rely on various white assistants and the Induna. The Induna was a type of "chief", who was chosen by the manager, as opposed to being elected by the miners. The role of the Induna was to settle quarrels and to keep the peace. He was rewarded for this by getting higher wages, better rations and a room to himself. One presumes, as in most hierarchical societies, that the Induna was in a position to bestow considerable patronage.[58] The Induna controlled the African compound policemen whose job was to keep peace and search rooms for alcohol, dagga and weapons. Many of the miners' grievances originated from the rough handling that they received at the hands of the compound police,

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[53]Van Onselen, Chibaro 136.

[54]Comparable with the typical image of the township manager as a retired policeman or soldier.

[55]Another good example of this was the one time Director of Native Labour for the Union, and Chief Native Commissioner for the Witwatersrand, Major Herbert Sutton Cooke.

[56]Van Onselen, Chibaro 136.

[57]Bozzoli 72.

[58]Moodie certainly found evidence of this in the 1970s ("Formal and Informal Structure" 569). There were also cases when the Induna showed loyalty to the workers instead.

who were often Zulus.[59] In each of the compound rooms was the Sibonda (pl. Isibonda), who although chosen by the miners to represent their interests also facilitated discipline in the room.[60] The miners themselves were housed along ethnic lines.[61] Each compound had a detention room, where workers who were found guilty of misdemeanours were imprisoned. It would appear that this room's function was often abused. Moroney cites examples where miners were simply locked up for days on end without being found guilty of any crimes.[62]

After Union

The formation of Union in 1910 required a national approach to legislation governing industrial and farm labour which, as mentioned in the first chapter, was partly achieved by the 1911 Native Labour Regulation Act. The Act repealed the Transvaal's 1905 Coloured Labourers Health Regulation Ordinance and stipulated that compound managers had to be licensed, workers' wages had to be paid in cash, and miners' contracts had to be recorded and explained to the miner in front of a magistrate. It laid down regulations governing the size of the barracks and how many miners should sleep in each room; it stipulated food regulations; and it also ordained that some provision had to be made for sick workers. Furthermore, it provided for the inspection of compounds and gave powers to the inspectors to prosecute where they deemed it necessary. It also outlined the procedure for compensation to miners injured or killed. Finally, of crucial significance to African workers' responses to work conditions, the

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[59]According to Hugh Tracey the Chopi sang songs about the fact that Zulus were invariably employed on the surface, either in the crusher houses or as policemen, and rarely went underground (Chopi Musicians, and Lalela Zulu [Johannesburg: African Music Society, 1948]).

[60]For an interesting discussion of the role of the Sibonda see Pearson, P., "The Social Structure of a South African Gold Mine Hostel," Honours dissertation, University of the Witwatersrand, 1975. Pearson noted that the Sibonda ensured the smooth running of the room through tasks such as bed allocation, preventing or stopping fights and delegating duties. Furthermore the Sibonda were also supposed to report misdemeanours, especially absenteeism, to the management.

[61]Accommodation along ethnic lines has been seen to be responsible for faction fights, but this has been convincingly refuted, by amongst others, McNamara. He argues that the key is to "distinguish between the sources of tension and the social form in which tension is manifested" ("Brothers and Work Mates" 323). An outbreak of violence may occur for many different reasons, and thereupon it will usually escalate as mobilization will take place along ethnic lines (McNamara, "Brothers and Work Mates" 320-323).

[62]Moroney, Honours dissertation 4.

regulation banned strike activity.[63]

The passing of the Native Labour Regulation Act was also an attempt, albeit unsuccessful, to prevent the following from happening. In 1910 an inspector was sent to inspect the hospital of the South Randfontein Mine compound "on account of the high mortality from pneumonia amongst the Natives recruited from North of Latitude 22° South". There he found that the patients were on beds without mattresses, the blankets were not clean, the floors were dirty, there was no supply of hot water and there was no steam disinfector (vital for disinfection purposes), and finally, "used bandages lay in the gutter outside".[64] It was therefore pointed out to the Mine that they had to build a new compound, which they undertook to do. A year later, after the new regulations had been passed, Dr G.A. Turner, a medical officer (MO) for the WNLA made an inspection of the same compound, which he declared was "unfit for human habitation". He also discovered that the miners were being accommodated in temporary dwellings while awaiting the construction of the new compound. The miners had neither bunks nor bunkboards and were thus sleeping on the floor. Furthermore, he found that the heating arrangements were inadequate and miners suffered further exposure to the cold by having to walk 1.5 miles to the mine shaft every day. The temporary arrangement was clearly a contravention of the Native Labour Regulation Act.[65] Surprisingly Turner returned three days later and declared that "the natives are now housed in a manner which can be described as satisfactory".[66] The story does not end there. A month later ten miners died of pneumonia. All ten had been accommodated in the temporary quarters. The Director of the GNLB ordered an investigation, which found that six of the deaths were directly due to the nature of the accommodation. Apart from not revealing why the other four died, the

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[63]Act No.15, The Native Labour Regulation Act, 1911.

[64]TAB, GNLB, 14 4389/10, letter from F. Arnold, Mine Inspector, to the secretary for the Interior, 24 November 1910. Mine hospitals, unlike hospitals elsewhere in South Africa, were to be inspected by officials from the NAD. Normally hospitals were inspected by either local or provincial health inspectors (UG30-1944 24).

[65]TAB, GNLB, 33 3816/11, letter from Turner to the secretary of the WNLA, 23 October 1911.

[66]TAB, GNLB, 33 3816/11, Turner to the secretary of WNLA, 25 October 1911.

report, though critical of South Randfontein Mine, did not think that the mine should be prosecuted.[67]

Colonel Gorgas

In 1913, at the invitation of Mr Evans, director of the Corner House group, Colonel Gorgas, Surgeon General for the United States of America, arrived in South Africa. His mandate was to utilise the experience he had gained in bringing the death rate down amongst construction workers on the Panama Canal and make recommendations for a similar improvement on the Rand. Gorgas saw TB and pneumonia as the chief killers and made recommendations to lessen the chance of miners being infected with either of these diseases. The most serious sanitary defect that he noticed on the mines was "the manner of housing the native. The quarters are much too crowded".[68] Overcrowding forced miners into close contact, thus increasing the chances of being infected. On the topic of compounds Gorgas was surprised to find that, "in general, the care of the compound yards showed everywhere neatness, cleanliness and commendable care and discipline. But when we came to examine the interior of the native living quarters the very opposite was the case". Gorgas found food lying around, lots of litter and of course the "mcheka". While he conceded that cleaning did occur, it only occurred about once a month and "in a very few days conditions are as bad as ever".[69] Gorgas went on to recommend that the mines should let the miners live with their families in separate dwellings, serviced by water-borne sewerage, and let them feed themselves. However, if the mines were not prepared to do this, and were to continue with the compound system, he recommended that each miner be provided with about fifty square feet of floor space, an individual bed and a box to put his possessions in, that miners be forbidden to take food into their rooms, that eating sheds should be constructed, and that barracks be divided into smaller rooms holding fewer miners.[70]

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[67]TAB, GNLB, 33 3816/11 (both letters), letter from the secretary of WNLA to the director of the GNLB, 9 November 1911, and letter from the acting director of GNLB to the secretary of WNLA, 12 December 1911.

[68]Colonel Gorgas, "Recommendations as to Sanitation Concerning Employees of the Mines on the Rand made to the Transvaal Chamber of Mines," in COMAR (1914) 345.

[69]Gorgas 347.

[70]Gorgas 335-355.

Gorgas also recommended that the mines centralize their health system to prevent duplication of services and to ensure better health care for ill miners. At the time of his report there were thirty eight physicians attached to the fifty four mines, each of whom was required to perform some surgery, medicine, and pathology, and also be responsible for mine sanitation. It was economically impracticable to equip these hospitals properly and so Gorgas felt that it would be better to combine the hospitals and create a central system, staffed by full-time medical officers.[71]

The mining group that took the Gorgas report the most seriously was the Corner House. After all it was one of the their directors who had invited Gorgas out in the first place. The Corner House appointed Gorgas's assistant in Panama, Dr A.J. Orenstein, as its chief MO. Soon after his appointment in 1914, Orenstein set up a Department of Sanitation, which introduced waterborne sewerage for the mines in the group. The Modder B Mine, owned by the Corner House, attempted to apply Gorgas's recommendation that miners' families live on the mines. The experiment was not very successful and broke down:

> One of the reasons why it broke down was because they put up huts of concrete; a native does not like particularly the round type of hut built of concrete. In the first place, he says it sweats; produces dampness on the walls - which is perfectly true. Secondly, he says he is a man who has adopted European standards of life; the European makes square furniture and not round furniture and if he has a round hut and puts square furniture into it, his floor space is reduced to a minimum.[72]

Mines balked at the cost of building separate dwellings for each miner, and, as mentioned earlier, they only wanted senior African staff as permanent workers. They also argued that there was not enough space for this type of development.[73] Fraser argued that "the industry rejected the housing recommendation for various reasons of which the main one was the policy of the South African Government which opposed the settlement of migrant workers and their families".[74] But while this

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[71]Gorgas 353-355.

[72]TA, K26, Major H.S. Cooke, Director of GNLB and Chief Native Commissioner for the Witwatersrand, evidence to the Native Economic Commission, 4 May 1931, 7226-7227.

[73]Orenstein, A.J., "Compound Sanitation," in The Proceedings of the Transvaal Mine Medical Officers' Association 2 (1922): 1-19. See also Orenstein, Notes on Elementary Hygiene 21. Orenstein explained that "considerations of cost necessitated the use of double tier bunks in compounds," as well as preventing a small number of miners being accommodated in each compound room.

[74]Fraser 6. Unfortunately Fraser provides no evidence for this statement.

was certainly true, it takes the onus away from the mining industry which did not seem to be concerned that it could not implement Gorgas's recommendations. Packard has argued that a further reason for the failure to implement a permanent housing policy was a medical one. The industry did not want to disrupt the migrant system, since it was thought to have a beneficial effect on the miner as it allowed him a recovery period in the reserves, thus making him less susceptible to diseases.[75] Nevertheless the system initiated by Gorgas, and put into practice by Orenstein, was a radical departure from the approaches in place elsewhere. The key component was that all issues that related to sanitation, from hygiene and accommodation to disease control, fell under the ultimate jurisdiction of Orenstein who reported directly to the chairman of the board.[76]

However, neither the State nor the miners were enthusiastic about centralisation. The miners were unhappy as they found it difficult to visit their friends who were recovering in hospitals no longer part of the compound.[77] The State was sceptical over the idea as it saw centralisation as simply an attempt by the mines to reduce hospital costs.[78] Nevertheless, twenty years later the Chamber of Mines decided all the mines should follow suit, and therefore decided to build a central hospital.[79]

Native Grievances Commission

In 1913 the Government appointed Mr H.O. Buckle as the sole commissioner to the Native Grievances

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[75]Packard, "Industrial Health Policies" 187-209. See also Packard, White Plague 200-201. This particular issue will be discussed in chapter five.

[76]For more details see Fraser, especially 9-13. Baker argues that the Corner House found it was too expensive to build one large central hospital and therefore they opted to refurbish four existing hospitals. However, "the result was a confusion of protracted piecemeal changes which introduced a new series of problems without solving many of the old ones (Baker 104).

[77]TA, K160, WNLA's written evidence submitted to the Low Grade Ore Commission, 24 July 1919, 607-618.

[78]Baker 104-113. The state were also concerned about the reduction in the number of available beds. The fears were partly realised by the increased mortality rates on 6, out of 8, of the participating mines (Baker 111). Baker appears not to have taken the 1919 Spanish Influenza epidemic into account.

[79]COMAR (1936) 55. Space does not permit a full discussion of this debate over centralisation. For more details see SAB, GES, 390 28/5, Cluver, E.H., "The Desirability of Central Health Control for the Whole Industry," 16 March 1925. Cluver subsequently wrote a number of other reports dealing with the centralisation issue, some of which can also be found in box no. 390.

Inquiry, set up in response to petitions by African miners to investigate their living and wage conditions after the 1913 miners' strike. Buckle interviewed over a thousand African miners as well as many whites in authority, and reported to parliament in July 1914 on a variety of issues, including work and wages, health and diet, compound conditions and control, and assaults on miners. The report was hard hitting, the mining industry came in for much criticism, but of the 89 recommendations made to ameliorate the African miners' lot many were never implemented.

Buckle was especially concerned with the issue of control. He wrote:

> There are normally about 200 000 native mine labourers on the Reef. They are all male, practically all adults and the large majority in the prime of life. They are scattered over 50 miles of country in blocks of from 1000 to 5000 in each compound. They can mobilise themselves in a few minutes, armed with such weapons as assegais, jumpers, axes, etc. A good many of them consider, whether rightly or wrongly, that they have grievances against Europeans, and most of them are savages, whose only idea of reform is violence. All of them want more pay, and most of them are under the impression that the employment of force by European miners during the riots of last July resulted in the latter obtaining their demands. It is not necessary to emphasise the possibilities of mischief which are latent in such conditions of affairs.[80]

His fear of the "savages", and hence concern about control, also illustrates the essentially paternalistic and racist prejudices and assumptions that dominated mining authorities' thinking about Africans. Hence Buckle recommended that future compounds should "be so designed that, while habitually open, they should be closable upon an emergency" and that steps should be taken "to render the compounds more easily convertible into places of detention, where the compound has strong steelcased gates which can be locked from the outside..., only one entrance, and high walls with no outer windows".[81] In other words, Buckle recommended a panopticon. Furthermore, in keeping with the concept of the panopticon, each compound should have "an intelligence department or secret service in the compounds to keep in touch with native feeling".[82] Tighter control would not only ensure peace in the compound according to Buckle, but "the curse of the illicit liquor trade is completely done away with, so far as the

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[80]UG37-1914 64.

[81]UG37-1914 65.

[82]UG37-1914 66.

native is concerned, and he is protected from many other sources of temptation".[83]

Buckle not only lamented the "obvious defects of the present compounds" from the point of view of control, but he also had much to say about conditions in both the workplace and the living space.[84] He was also highly critical of the ticket system and found insufficient amounts of food, hot water, and fuel provided for miners on a number of mines.

Buckle also received a number of complaints about the mine hospitals and he was highly critical of the inadequate medical attendance in these hospitals. In most of the hospitals the part-time doctor would have to see large numbers of patients in a very short time to enable him to attend to his medical duties elsewhere. Buckle correctly assumed that the doctors skimped on the attention they gave African miners.[85] Part of the reason for doctors spending little time with their African patients was that they found this type of medicine "monotonous", an opinion that Buckle refused to accept. He therefore concluded that "there is no room for doubt that in most cases, the provision for medical attendance upon mine labourers is inadequate", and recommended "that the appointment of whole time medical officers for native labourers should be made compulsory".[86]

The Rand Daily Mail stated bluntly that "stripped of official reticence and caution, the report is a pretty bad indictment". Its critique did not stop there, but went on to say that

> It is difficult to believe that people who are perpetually complaining of a shortage of native labour, can be so stupid as not to see any connection between their own neglect and a labour famine. But it is still harder to understand how people who are perpetually clamouring for "efficiency" can expect a proper return in work for the wages they pay and from improperly fed labourers.[87]

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[83]UG37-1914 66.

[84]UG37-1914 67. See also chapter two of this thesis.

[85]UG37-1914 28-29.

[86]UG37-1914 30-31. See also Daubenton, F., "Training and Specialisation of Mine Medical Officers," Proceedings of the Mine Medical Officers' Association 15 (May 1935): 75-80. Daubenton argued that mine doctors found the medicine boring and that they were reluctant to remain "kaffirdoctors".

[87]"A New Delight: The Labour Grievances".

The sub-committee set up by the Chamber of Mines to analyze and comment on the NGC report agreed with much of what the report had to say, but agreement did not necessarily lead to implementation. It cautiously recommended bigger cages, where possible, and that more cages run at mid-day; a maximum of two hours lashing per "hammer boy" per day; a better distribution of drills; a compulsory hot ration before the miners went underground and unlimited supplies of porridge; hot water to be made available to every miner; and fuel for the stoves to be provided. Surprisingly the sub-committee agreed with the recommendation that "boss boys" should not be allowed to carry sjamboks, especially as a number of the managers who gave evidence to the NGC had argued that they did feel they had enough control over their workforce.

The Chamber refused to support the idea of change houses being erected on all mines, citing not the cost factor, but "the diversity of medical opinion" which prevented the Chamber from coming to agreement on the topic.[88] The construction of change houses had been an issue from 1907 onwards. In that year the NAD medical committee had recommended that "where the compound was 500 yards from the shaft head a change room with heating facilities" be established and provision be made for workers to leave their blankets to use when they came up. Compound managers had then disagreed with this idea as they were of the opinion that "natives would not leave their clothing in a change house to be dried, and that a system of compulsory change of clothing would be extremely difficult to enforce".[89] In 1911 change house regulations were passed which stipulated that there were to be pegs on the walls for hanging clothes, benches, baths or showers with hot and cold water, a stall where coffee was to be issued, a covered walk-way if the shaft was more then 100 feet away, and that the change house should be policed. In winter the change house was to be warmed.[90] This was all done in an attempt to prevent the miners from contracting pneumonia, which was a major killer on the mines in the Reconstruction period. By 1935 the majority of the mines had constructed change houses. The only mines that had not

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[88]COMA, "Report of the Sub-committee on the Native Grievances Commission Report," 31 July 1914.

[89]COMAR (1907) 17.

[90]COMAR (1911) 29-30.

were those that had compounds very close to the shaft head.[91]

The issue that the Chamber had the biggest objection to was Buckle's recommendation that the mines employ full-time doctors and centralise the medical system. The matter was debated at intervals for the next 20 years. Other recommendations, too, were not uniformly implemented, as the following examples illustrate. An inspection of the Village Deep compound, for example, in 1918 found that

> A number of the floors are badly in need of repair...there is a considerable shortage of bed boards...many of the natives are lying with only a blanket between them and the cement...glass (in windows) is covered with limewash...the showers here are nearly all out of order.[92]

A mining inspector in 1918 found that the 200 cubic feet of air space per inmate was too small for the miners, and that the two-tier bunk system promoted overcrowding because "bunks are largely shut in with hung up blankets and clothing". Braziers were still being used, despite the bad effects these had on those in the room. Washing facilities for clothes remained inadequate, and many mines continued to have "no disinfecting facilities".[93] In the same letter he referred to the married quarters on the Nourse Mines Ltd., where conditions were described as "extremely bad".[94]

Conditions in the 1920s and 1930s

Baker makes the important point that the mining industry during the 1920s preferred to compare compound conditions with housing conditions in the reserves instead of with miners' quarters in other countries, a comparison that suited the industry well as conditions for "the majority of African inhabitants in South Africa were appalling. Insanitary housing and polluted water supplies meant that

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[91]COMA, minutes of a meeting of the Health Advisory sub-committee, 4 June 1935.

[92]COMA, C. Wallace, Assistant Mines Sanitation Inspector to Acting MO, 2 February 1918. Three years later Wallace, in a letter to another inspector, found that, while the latrines were clean, sawdust urinals were still in use (COMA, report from C. Wallace, Central Mines Sanitation Inspector, to Inspector of Mines for Johannesburg, 19 January 1921).

[93]TAB, GNLB, 210 1855/14 letter from Assistant MO for the Union to MO for the Union, 11 May 1918.

[94]Similarly, A. Noive, a sanitation inspector on the mines, found on the Consolidated Langlaagte Mines in 1921 that the roofs leaked; window panes were broken; the kitchen roof was badly in need of repair; and that "the making of Marewu [low-alcohol beer] in rooms...by the natives should be discouraged, as the spilling from the receptacle causes an accumulation of filth which cannot be removed by sweeping" (COMA, report by A. Noive, Mines Sanitation Inspector for the Western Ares, to the MOH for the Union, 3 January 1921).

preventable diseases were rampant".[95] Even so, the mines in some instances were ignoring their own regulations and recommendations. Evidence for this can be seen in the statement released by the executive of the Transvaal Mine Managers' Association in 1928 which reminded their members that "concrete bunks be installed when any alteration or reconstruction of old compounds is contemplated".[96] This reminder suggests that some mines continued well after the 1905 Ordinance to ignore the ruling that compounds were to have concrete and not wood bunks. The following year inspections of fourteen compounds showed that the conditions could "only be described as disgraceful from a sanitary point of view".[97] Despite a condemnation of these mines, which flouted many of the regulations, the State felt that the whole matter would receive "further consideration".[98] Nothing further was done.

The mines did not always agree with the reports of inspectors and would often attempt to refute them. In 1929 the MMOA issued the following statement:

> We have again had to contend with the annual criticisms from the Union Department of Health in regard to hygienic conditions on the mines...While this Association is only too willing (as far as is in its powers) to give effect to any of the Department's recommendations which may be of practical benefit, it holds very strongly that Government officials cannot adequately comprehend conditions on the mines from a few cursory visits to us and the analysis of figures in Pretoria.[99]

Conditions on some mines were certainly not much better in the early 1930s, when a major issue was the overcrowding in the mine compounds. The increased profits accumulated by the gold mines as a result of the rise in the gold price meant that gold mines were in a position to step up production. This development required more labour, which was duly recruited, but a corresponding improvement in

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[95]Baker 48-49.

[96]COMAR (1928) 38.

[97]SAB, GES, 905 702/13c, G. K. Mitchell, secretary for Public Health to the General Manager of the Chamber of Mines, 6 June 1929.

[98]GES, Mitchell, 6 June 1929.

[99]MMOAA, minute of the MMOA, 28 May 1929. A number of other examples of this type of statement can be found in the minutes of the MMOA. See, for example, the minutes of 26 January 1928 and 29 April 1930.

compound accommodation was slow in coming. Apart from the Corner House group all the other groups had a serious overcrowding problem on their mines. Some groups were on average more then 12.5 per cent overcrowded. The biggest culprit was the Simmer and Jack mine which was more than 20 per cent overcrowded. Mines managed this by using two shifts, in other words while the one shift was working the other shift was asleep, which meant that beds had to be shared. The other strategy to accommodate more miners was for partitions between bunks to be removed to allow more people to be fitted into the space available.[100] Such overcrowding was not conducive to harmonious relations within the walls of the compound, for as one miner remarked, "if you put a whole lot of cattle together in a kraal and overcrowd them, they will stamp and horn each other".[101]

Overcrowding was not the only problem that mine managers failed to alleviate. Baker notes how, in 1934, the Director of NAD had found on a number of inspections

> that compound rooms, reconditioned by the provision of deep partitioned concrete bunks at right angles to the walls, have reverted to their former insanitary conditions owing to the action of the inmates who have filled up the space between the lower and upper bunks with rough wooden bedsteads curtained off in the manner which has been condemned for the past quarter of a century.[102]

In the same year the TB Research Committee noted that compounds condemned by Gorgas in 1914 still existed on some mines.[103] Nevertheless, by World War Two the majority of the miners had moved from rooms that accommodated forty to 100 miners to ones that housed twenty miners. While compounds continued to be built with similar designs, gardens, better sanitation and water supplies were

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[100]SAB, GES, 905, 702/13c, E. H. Cluver to acting secretary for Public Health, 15 May 1931.

[101]Quoted in McNamara, "Brothers and Work Mates" 321.

[102]Baker 169.

[103]COMA, TB Research Committee report, 1934. Two years prior to this the Committee had unanimously agreed that "many of the compounds are unsatisfactory; that the accommodation of 40 or more men in the same room for sleeping and eating, with about 200 cubic feet of air space per person involves risks of overcrowding and the distribution of air-borne infection" (Public Health Report, UG33-1932). Wilson, in 1969, found that 15 per cent of the workforce on the gold mines continued to be housed in compound accommodation built before World War One (58).

now being provided by the mine companies.[104] It is tempting to see further confirmation that the majority of the compounds had improved in the absence of critical inspection reports in the Archives for this period.[105]

However, not all had changed for the better. This is demonstrated in a document presented to the Native Mine Wages Commission in 1943 by the African Mine Workers' Union (AMWU). The document outlines the grievances of the Union's members who worked on the gold mines. The AMWU recorded in the margin of the document the paragraph number from the Buckle report for 1914 which applied to each grievance under discussion. This makes clear that a number of the grievances the union was presenting in 1943 were very similar to grievances Buckle had recorded 30 years earlier.[106] Making due allowance for the AMWU over-stating their case, their document still provides a useful checklist of what had changed and what had not. Thus in 1914 Buckle had recommended that delays in transporting miners should be avoided as they were unnecessary. As an example that this practice still existed, the AMWU presented a case study in which all the miners left the compound at 3.00 a.m. even though the last cage only went down at 6.30 a.m.. Furthermore, the AMWU, like Buckle, drew the mine owners' attention to the lack of fuel for the stoves and the insufficient supplies of food and hot water. On the issue of control, Buckle had recommended that mine police should be accompanied by a representative of the mine management. Thirty years later the AMU pointed out that "no Europeans accompany the mine police, despite Mr Buckle's suggestion".[107]

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[104]Orenstein, A.J. "Report for the Year 1936" (Johannesburg: Health Department, Central Mining - Rand Mines Group, 1936) 47-48. This report, which may be biased, confirmed this. Furthermore the following chapters, which discuss mortality and morbidity on the mines, will also confirm this.

[105]Assuming, of course, that all documents reach the Archives.

[106]University of Cape Town, Jagger Archives, Ballinger Papers, BC 347 C5, *12 "Comparison of complaints brought to the notice of the Native Grievance's Enquiry, 1913/14 and those received from its members by the African Mine Worker's Union". I would like to thank Renfrew Christie for drawing my attention to this document.

[107]The above is taken from the African Mine Workers Union's document ("Comparison of complaints"). For a useful discussion of the Native Mine Wages Commission (Lansdown Commission) see Diamond, especially pages 116-192. According to Diamond both the press and the commissioners discussed the AMWU's document and both concluded that it was an exaggeration. Justice Lansdown declared, after reading the document, "one wonders why half the labourers are not dead" (quoted in Diamond 192).

Nevertheless, hospital accommodation had certainly improved by the start of the Second World War. The Gluckman Commission remarked that the system established on the mines was "excellent", in sharp contrast to what it had to say about much of South Africa's health care.[108] By the time of the commission the mines had a hospital bed ratio of one per 40 miners employed. In all there were sixty mine hospitals, which not only treated African miners but also rendered "a valuable service in training of personnel. Thirty three of them are recognised by the Medical Council for training of male nurses....Three large hospitals...ha[d] gone a step further...and train[ed] female probationers".[109] However, Gluckman was critical of the inadequate "physiotherapeutic services", vital for rehabilitating accident victims, especially those who might have lost a limb.[110]

Miners' Response

Miners would respond to the conditions outlined earlier in various ways, the most noticeable of these being strikes, forbidden by the Masters and Servants Act. Miners had few options when it came to pressurising mine managers into ameliorating working and living conditions. Withholding labour was one option which forced the mine managers into a situation that was sometimes resolved through compromise by miners and managers alike. In the previous chapter mention has already been made of a number of strikes that occurred in this period. In 1902, 1 100 miners on the Langlaagte Deep Mine marched out of the compound as they disliked the mine manager's methods of management. Interestingly, the miners were marching to the Village Deep compound to offer their services where they felt they would be better treated. The miners never made it and were escorted back under the eyes of the mounted police.[111] It was the 1913 strike that forced the government to take cognisance of working and living conditions. Another crucial industrial dispute during this decade was the 1919 trade store boycott (see chapter four), which was launched against the backdrop of a series of strikes across the Rand. Further strikes occurred in July 1919 on the Crown Mines, Robinson Deep and Ferreira

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[108]UG30-1944 73.

[109]UG30-1944 73.

[110]UG30-1944 73.

[111]Callinicos 1: 91. For other incidents of unrest in the period 1901-1902 see Warwick (169-174).

Deep, but the police broke these up. On 6 November 1919 300 mine workers marched to Johannesburg from the Rose Deep Mine in Germiston to complain about food.[112]

A less dramatic form of protest, but one that probably caused far more inconvenience to the mines, was desertion. The average desertion rate for companies relying on WNLA to provide labour for them, in the period 1909 to 1919, was 2 995 miners annually.[113] Desertion was especially prevalent while conditions remained bad and compound security remained non-existent. There was a clear difference in the desertion rate between those mines which had fair compound conditions and those which did not. In 1908, for example, the Jumpers mine, which compound inspectors had found to be satisfactory, had 0.15 per cent of its workforce desert, while the Simmer Deep mine, about which officials had received numerous complaints, had a desertion rate of 6.18 per cent.[114]

Moroney gives a number of examples of how miners chose mines during the reconstruction period. Wages and compound conditions were the decisive factors. Other factors included the "newness" of the mine; deep level mines, recently opened, were avoided as shaft sinking was seen to be far more difficult and perhaps more dangerous than actual mining. Working conditions, poor food, cruelty and the mine's safety record were also an issue.[115] The following average desertion rates for the Witwatersrand gold mines show that desertion rates decreased over time.[116]

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[112]Callinicos 1: 93-96.

[113]Baker 68, see also Table no.3 in Jeeves, Migrant Labour 165. Desertion did, however, vary over time. In 1909, for example the WNLA recorded 9856 desertions whereas in 1919 it recorded only 215 desertions (Jeeves, Migrant Labour 165). Miners from the Cape's reserves were the most likely to desert.

[114]Callinicos 1: 89.

[115]Moroney, Honours dissertation 93-97. According to van Onselen desertion occurred at the end of the month and therefore after pay day (Chibaro 239).

[116]Taken respectively from the Director of the GNLB annual report's for 1911 (UG 17-1911 391), 1912 (UG 10-1913 42), 1913 (UG 33-1913 69), see also Moroney, S., "The Development of the Compound as Mechanism of Worker Control," South African Labour Bulletin, 4 (May 1978): 96-7.

State officials, owing to insufficient evidence, were not entirely clear why the rates were decreasing. However, they were convinced that their calls for both improved compound conditions and better security were responsible for the decrease.

Desertion Rates, 1909-1912 (per 1000)	
1909	119.1
1910	64.4
1911	61.8
1912	58.5

Table 2: Desertion Rates

There were also more subtle ways of surviving in the compounds, which involved the creation of a compound culture in the limited spare time that miners had.[117] Absent from the early literature are the voices of the African miners. Although the silence remains, what follows is an attempt to give a brief insight into life in the compound so as to suggest how the miners achieved some form of psychological well-being under harsh living conditions.

In his discussion of the mine culture observed on a Free State gold mine, Moodie argues that "the compound is not simply a regimented dormitory. Mine compound dwellers have their own beliefs and expectations - their own culture".[118] Many of the foci of mine culture are seen by Moodie as a response "to the most important exigencies of compound life - the pressures of the work situation and separation from home".[119] As miners come from different cultural groups throughout Southern Africa, different groups respond in their own ways to the mine experience. The most distinctive are the

[117]A substantial literature exists today on compound culture, much of which has been written by anthropologists. However, the majority of the studies only explore the culture from the 1970s onwards. Therefore very little exists on the state of compound culture before World War Two. Furthermore, the studies that do exist tell one more about the authors than about life in the compound. In other words, the early literature has a strong paternalistic element which epitomizes the thinking of the white mining authorities. See for example Junod, H.A., The Life of a South African Tribe 2 Vols. (London: Macmillan & Co., 1927) 1; and Schapera, I., Western Civilization and Natives of South Africa (London: Routledge, 1934). Junod gave a series of lectures, based on the book, to mine managers so that they would "know" something about African miners.

[118]Moodie, T.D., "Mine Culture and Miners' Identity on the South African Gold Mines," in Bozzoli, B., (ed) Town and Countryside in the Transvaal (Johannesburg: Ravan Press, 1983) 176-197.

[119]Moodie, "Mine Culture" 184.

Shangaan group, from Mozambique, who traditionally serve the longest contracts.[120] The culture that developed in the mine compounds, because of the obvious difference between the rural home setting and the industrialised work setting, is unique. A further reason for this difference is that workers assume "another blanket", in other words they undergo a change in socialization to be able to cope with a highly stressful work and living environment.[121]

Photographs of the period illustrate that the miners were involved in various activities during the periods off duty, such as haircutting, making ornaments, management-organised dance competitions, drug and alcohol consumption.[122] This culture would often be an influencing factor in the choice of mine. A miner would return to the mine

> where he had friends, where he had established some security and perhaps some understanding with the compound "police", where he had probably made arrangements to meet and work with relatives or friends and where he had the right sort of contacts to ensure survival.[123]

Although some of the compound activities revolved around dagga smoking, alcohol abuse, and homosexuality as traditional lifestyles collapsed in the compound system, this does not mean that the only forms of compound culture to develop arose out of the miners' needs to escape from compound reality.[124] Miners arrived with their own cultural system which would gradually be adapted to

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[120]They were commonly referred to as "East Coasters". For more details on distinctions observed by Moodie between different groups see his "Mine Culture" 186-187. Note that these observations were made in the 1970s and one therefore expects that the practices described may well have changed since the decades before the war. After all, culture is a dynamic force that is continually changing.

[121]The phrase "another blanket" is taken from a song that Lesotho mine workers sing as they cross the Caledon river. Quoted by Moodie, the miners sing "Now I assume another blanket... In crossing the river I become a new man, different from the one I was at home".("Mine Culture" 195). According to Gordon "the secret of the blacks' survival in the white industrial world lies in keeping the whites as ignorant as possible about the black" (Gordon 102). Coupled to this survival was the ability of the African miner to stay out of "trouble", which is achieved "by abiding by the rules of etiquette which are typical of those in a colonial situation"(Gordon 120). Examples include not answering back and doing what one has been told to do.

[122]See photographs in Callinicos 1: 45-46.

[123]Moroney, Honours dissertation 10-12.

[124]The most comprehensive discussion of homosexuality on the mines is Dunbar Moodie's "Migrantcy and Male Sexuality on the South African Gold Mines," JSAS 14 (January 1988) 228-278. See also Moroney, "Worker Control" 61 and van Onselen, 2: 117-201.

compound culture.[125] Hugh Tracey, for example, has recorded a number of Chopi songs that were developed to describe the mines. The Chopi, from Mozambique, were renowned for their ability of play the timbila (Africa's xylophone), with which they accompanied the "tribal" dancers.[126] An example of such a song is as follows:

> Come together all you men and hear mdano/ Come together all you men and hear the sweet mdano/ The compound manager wanted something wonderful and called the Chopi/ The compound manager wanted something wonderful and called the Chopi to the compound/ They arrived, the Chopi, and composed for timbila, sweet timbila/ They arrived, the Chopi, and composed for timbila, sweet timbila in the compound/[127]

Not all the songs are so conciliatory. In 1928 the University of the Witwatersrand had a "Monster Native Dance" (sic) to assist the university's development fund. A number of Chopi and Shangaan dance teams participated. The lyrics sung by these teams outraged a number of officials who complained bitterly to the NAD. Apparently the miners had sung "the Portuguese are always collecting money from us, and now they want to close the way" (stop us from going to work); "there goes the East Coast train, it goes to the land of the Portuguese, who are treating us so badly".[128]

It is also important to remember that miners did have contact, albeit limited and problematic, with the rest of Johannesburg.[129] A typical incident occurred in 1912 when the government, under mounting

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[125]Van Onselen, for example, has made a similar observation, in Chibaro 195-204.

[126]For more details see Tracey, Chopi Musicians.

[127]The documentation these lyrics are taken from is all in the possession of Andrew Tracey, International Library of African Music, Rhodes University.

[128]The lyrics from the first song refer to the decision in 1928 to reduce the number of Mozambican recruits allowed to work on the mines. The lyrics and copies of the correspondence between the NAD and the Portuguese officials are in the possession of Andrew Tracey.

[129]See Moroney, "Mine Married Quarters". Also Bonner (173-297), in which he stresses the importance of the African miners who were living in locations in leading the 1920 strike. Xuma in Abrahams's Mine Boy is another example. Ironically the compound produced one unexpected result, namely it became a haven for criminals. Van Onselen, in his study of "the Regiment of the Hills" (Ninevites), has shown how criminals were "safer" if they owned a pass, easily obtained if one was prepared to register as a mineworker. The fact that the compounds were not closed meant that elements of the workforce were able to successfully involve themselves in crime after hours. Furthermore, the compounds provided a large pool from which the Ninevites could recruit as well as an avenue for disposal of stolen goods. ("South Africa's Lumpenproletarian Army: 'Umkosi Wa Ntaba ' - 'The Regiment of the Hills '1890-1920," paper presented at the Conference on Southern

public pressure, announced the setting up of a Commission to investigate assaults on women. What was at stake was the role of African miners in this abuse. The Chamber, in a statement actually critical of the system it had itself created, noted that the assaults were a result of a large group of men being separated from women for up to eighteen months at a time, the excessive use of alcohol, and the contact that miners had with "undesirable Europeans", especially female hawkers, as "experience has shown that the natives treat them with undesirable familiarity ". The Chamber recommended increasing the number of closed compounds, and harsher sentences.[130] The Commission, however, came out largely on the side of the miner, noting that "comparatively few" of the assaults on women could be traced to African miners, partly because "mine boys indulge in certain evil and loathsome practices to satisfy their passion". The commission noted, however, that alcohol did play some role in the assaults, largely because

> natives are much more easily affected by drink and less able to restrain themselves when under its influence than the white man, and that their moral sense is more readily lowered through it than in the case of a white man. Moderate drinkers are said to be rare amongst the African man (sic).[131]

The above statement is a further example of the paternalistic thinking that pervaded the whole relationship between the miners and the authorities.

Another prominent feature of compound culture was sport. Van Onselen has noted how, in the context of the mines in Zimbabwe, sport meetings were initially organised around Christmas. The sole objective was "the reduction of conflict".[132] According to Orenstein recreation "aside from the value

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African Labour History, University of the Witwatersrand, Johannesburg, 8-10 April 1976. For a slightly different version of this paper see van Onselen, 2: 117-201).

[130]COMAR (1912) 24-27.

[131]Commission on Assaults on Women: Final Report, UG 39-1913. Authorities also saw miners as carriers of sexually transmitted diseases (STDs). While it is difficult to find evidence of how many miners were infected, it would appear that they played a crucial role in transporting these diseases to the rural areas. In 1936 Orenstein, in an isolated study, found the incidence of STDs to be 95 per 1000 miners in the WNLA compound ("Report for the Year 1936" 42).

[132]Van Onselen, Chibaro 190. Gordon found the same thing in Namibia. Christmas, traditionally a holiday, was feared by management as it was usually celebrated with heavy drinking that may have led to fighting and ultimately affected productivity. Therefore, miners were encouraged to involve themselves in sport instead.

of keeping them [African miners] wholesomely amused, [had] an hygienic value, for while the native is engaged in dancing or watching the bioscope he obviously cannot be engaged in consuming alcohol or getting venereal disease".[133] The 1944 Witwatersrand Mine Natives' Commissioners agreed with this statement when they argued that recreation "provide[s] outlets for physical energy which in the natives' tribal state often finds expression in more undesirable manner".[134] During the 1930s, for example, soccer became very popular. In 1933 the Johannesburg African Football Association was formed, to which many of the mine teams were affiliated.[135]

Alcohol

An important component in leisure activity was alcohol. During the Reconstruction period African miners were banned from buying liquor from stores, but were provided with beer at mealtimes, as it was seen to improve health by providing vital nutrients. However, the consumption of excessive amounts of alcohol affected productivity and the authorities banned its sale, outside the compound, to Africans.[136] Van Onselen observes how the change to deep level mining had an important impact on the mining industry's approach to the consumption of alcohol by African miners. Until about 1895 the majority of mine owners encouraged the sale of alcohol to African mineworkers, but as deep level mining, which demanded tighter control over the workforce to ensure greater efficiency, developed, so mine owners moved towards prohibition of the sale of alcohol to African miners. This shift was not without its problems, especially as many of the major shareholders in the liquor industry also dominated the mining industry.[137] Furthermore, mine owners were well aware that any attempt at prohibition

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[133]Orenstein, "Compound Sanitation" 11. By the 1920s weekly cinema shows were given in all the mine compounds. Films shown were "carefully selected by a Board of Censors", and included "Safety First propaganda films" (Jeppe 2: 1762).

[134]UG21-44 31.

[135]Callinicos 2: 216.

[136]Production was affected by the miners drinking in their rooms at night, "with the result that in the morning they are unfit for work, and certainly not fit to be responsible for the safety of those under their charge" (Annual Report of the Government Mining Engineer for the Year Ending 30th June, 1907. Mines Department, Colony of the Transvaal, p.6, cited in Hobart Houghton et al. 2: 106).

[137]For more details see van Onselen 1: 44-102. See also Mendelssohn, R. Sammy Marks 'The Uncrowned King of the Transvaal' (Cape Town: David Philip, 1991) 69-74.

would have made the mines very unpopular amongst African workers.[138] However, the already scarce supply of labour was being aggravated by the daily absence of between fifteen and twenty-five per cent of the workforce due to alcohol.[139] Prohibition was legislated for in 1896, and subsequently enforced by the Milner government after the South African War. Nevertheless, as in America, prohibition was never entirely successful; for a price, any one who wanted hard liquor could buy it illegally from white traders.

Burawoy has argued that true to the paternalistic impetus behind the compound system, the companies "extended their control into recreational activities. In an attempt to regulate beer drinking, they constructed beer halls and outlawed home brewing" and encouraged dance societies and supervised religious meetings.[140] The dominant view amongst mine management was that "the native races of South Africa generally, in common with other uncivilised people, are mentally incapable of resisting alcohol".[141] Nevertheless, alcohol abuse was rife on the mines throughout the period under discussion, despite attempts by the authorities to prevent it. Baker notes that it was only by the 1920s that mine managers began to record fewer shifts lost as a result of drunkenness. According to Baker this was due to stricter enforcement of the laws by the police. Nevertheless,

> in 1926 experts admitted that the excessive use of alcohol by African workers was still a serious problem and prohibition a total failure because one sector of the community had access to alcohol while another did not.[142]

In a detailed study of alcohol abuse on the gold mines Baker demonstrates that the period Saturday to Tuesday was the highest for alcohol related absenteeism, that between one and fifteen per cent were

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[138]Van Onselen argues that alcohol played a crucial role in the recruitment of Mozambique mine workers (1: 51-52).

[139]Van Onselen I: 63. According to Cammack, Milner's enforcement of prohibition reduced absenteeism on the mines to about 7 per cent (201). On the eve of World War One the absentee figure was below two per cent of the workforce (Jeeves, Migrant Labour 171).

[140]Burawoy, The Politics of Production 229.

[141]Turner, G.A., "The Diet of the South African Natives in their Kraals," Transvaal Medical Journal 4 (March 1909): 227.

[142]Baker 231-246.

incapacitated daily and that on average each miner lost about 3.5 per cent of his shifts annually due to drunkenness. Furthermore, she notes that in the period 1903-1917 the state successfully achieved 168 521 prosecutions for the contravention of liquor laws by Africans living on the Witwatersrand. Yet, despite the prosecution success, the state was not winning the battle of prohibition. Alcohol production simply went underground and home brewing flourished. Between March and November of 1911 the state seized about 13 900 gallons of alcohol in the mine compounds. This discovery led the Acting Commissioner of Police to conclude that

> there is no doubt that the presence of large quantities of illicit liquor was well known all along the reef and was openly winked at by the mine authorities.[143]

The reason for all this winking by the mine authorities was that they knew that the mines where alcohol brewing was not punished were the more popular amongst the miners. Thus mine management was forced to accept the unacceptable, as to do otherwise would have proven costly. The police may be forgiven for suspecting collusion on the part of mine management, as indicated by their records of a slightly later date. In January 1915, for example, the police seized 5 250 gallons of beer and fifty gallons of khali on the Driefontein Deep mine.[144] In August 1920 the police seized 3 000 gallons of beer on the Simmer and Jack mine. The following year on the same mine, again in August, the police seized 3 280 gallons of beer.[145] The police were convinced that it was "safe to say 90 per cent of the assaults and tribal disputes which take place are due to the effects of this accursed mixture". Hence their enthusiasm to enforce the ban on sales to Africans.[146] The problem for the police was that the raids were no more than symbolic as they could not search the whole compound every time they raided. Furthermore khali could be brewed very quickly. Therefore police were only able to limit production, not halt it altogether.

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[143]Quoted in Baker 255.

[144]Khali was made of barley and golden syrup which was left to ferment. Water and "Nseme"(a root of unknown origin) was then added. For the details see COMAR (1913) 23-26. Van Onselen observed a similar process of quick fermentation on the mines in Zimbabwe. There the miners made beer stronger and faster using a special dried root -Qilika - which he argues was undoubtedly the same root used on the Rand as it originated in the Cape (Chibaro 170-171).

[145]Baker 255.

[146]H.J. Kirpatrick, police inspector, in a letter to the Chamber of Mines, COMAR (1913) 23-26.

It was not just beer and khali that the police found. In 1903 one manager found 1 020 empty Eau-de-Cologne bottles, whose late alcoholic contents had been 30 per cent proof.[147] Managers were in a difficult position, as on the one hand they realised that alcoholism had a detrimental effect on productivity, while on the other hand strict enforcement of the law would have made the mine very unpopular amongst the miners. Hence managers tended to opt for compromise solutions in which they were lenient, enforcing the law only when under pressure from the police to do so.

Despite Baker's comprehensive look at how ineffective the legislation was, and her attempt to investigate which authorities were to blame for the alcohol abuse, it is not clear why the miners were drinking so much nor why they were going to such great lengths to acquire alcohol. She simply lists the problems without explaining what she means by the causes she suggests:

> while it is possible to cite industrial stress, boredom, an inadequate diet as factors influencing their determination to obtain strong stimulants it is also accurate to interpret their actions as a form of protest.[148]

Alcohol abuse may be explained not only as protest but also as a form of resistance to the harsh environment that made up the miners' world. The fact that every day was spent deep under the earth where each second could be one's last was bound to leave deep psychological scars on even the bravest miner.[149] On surfacing, the miner was faced with inhospitable accommodation and tasteless food, so that it is little wonder that he turned to ways of escaping. Unfortunately, archival searches have yet to turn up the miners' versions of why they were drinking, but it is quite possible that poor socio-economic conditions and the terror that their work instilled in them were significant factors in the alcoholism so rife on the mines in this period. Furthermore, it should be noted that in most cases consumption was doubtless a communal social activity.[150]

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[147]COMAR (1903) 140.

[148]Baker 247.

[149]For examples of this fear see Vilakazi, B.W. "In The Gold Mines", cited in Wilson 190-194. The Chopi sing a song about the fear of travelling on the skips (Callinicos 1: 53).

[150]Gordon in his study of black mineworkers found that "drinking together is one of the most important rituals of brotherhood and friendship" (Gordon 116). Other reasons for drinking, according to Gordon, were that the miners had nothing else to do and they wanted to "forget about home". He stresses that he had "yet to find a description of a mining community anywhere in the world which does not have drinking as a strong

Conclusion

This chapter has shown how the mining industry, in recovering from the setbacks of the South African War, began to construct a permanent compound system. Encouraged by the State, anxious about the health and crime risk the burgeoning African miner population posed to the whites of Johannesburg, the mining industry was willing to oblige, especially as it also had good reasons for wanting a more efficient system of control. Deep level mining demanded greater control over the workforce, so as to ensure efficient production. The most visible response to this control were the 1913 and 1920 strikes, but the brutal reaction by state and mine officials in quelling this unrest showed that high levels of coercion had been achieved. Nevertheless, while panopticons may have been desirable they were not practical, and, more importantly, they were not cost effective. Paternalistic managements were thus forced to accept the unacceptable (alcohol, homosexuality and drugs), because not to do so would have been too costly. Miners were thus able to have a say in defining their own world to ensure their survival: whereas the horse was given the day off, the miners had to take it, and did so.

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focus of leisure activities"(117). Moodie has found on the Rand mines evidence of a "myriad of 'brotherhoods'. Rackets abounded in this environment - food rackets, illegal alcohol and drugs, homosexuality, gambling, plotting rural politics - as did other informal activities based on home-friend solidarities, entrepreneurial services...or other shared interests" (Moodie, "Social Existence" 51). For more details on migrant culture see Moodie, D., "Social Existence and the Practice of Personal Integrity: Narratives of Resistance on the South African Gold Mines," in Spiegal, A.D., & McAllister, P.A., (eds) Tradition and Transition in Southern Africa. (Johannesburg: Witwatersrand University Press, 1991) 39-63.

Chapter Four

Myths and Mealies: The African Miners' Diet

> The ultimate object of feeding the native labourer...is to supply the Mine Manager with the human energy which he requires to mine the rock...the efficiency of the labourer comes to be expressed in the number of tons mined. But in order to keep the machine going you have to keep it in good working order. It needs lubricants and repairs.[1]

Crucial to any understanding of compound and health conditions on the Witwatersrand gold mines is a consideration of the miners' diet. Miners were not only given accommodation but were also fed by the their employers. The Chamber and other interested parties spent a considerable amount of energy, time and money grappling with the question of how best to feed miners. The majority of these experiments were aimed at ensuring a more productive labour force. Yet, as the above quotation succinctly illustrates, this functional approach was located within a paternalistic approach to nutrition which stressed the benefits of the diet to the miners. Furthermore, it will be argued that this way of thinking led to incorrect assumptions being made about the diet of rural Africans which in turn influenced the nature of the food issued in the compound. Finally, the effect this diet had on African miners will also be discussed.

Dietary Myths

One of the men at the forefront of research into miners' diets was Dr G.A. Turner who wrote a series of four articles in the Transvaal Medical Journal in 1909 entitled "The Diet of the South African Natives in their Kraals". In the articles Turner, without doing any fieldwork himself, provided a summary of what he deemed the diets to be, including the regional differences and the types of foodstuff consumed amongst the different African groups in South Africa.[2] His views on this topic seem to have been widely accepted and can be summed up in the following passage that introduced the four articles:

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[1]COMA, letter from E. H. Cluver, Assistant MOH for the Union, to the secretary for Public Health, 30 November 1928.

[2]For a more useful study of the different diets of rural Africans see Fox, F.W., & Norwood Young, M.E., Food From The Veld (Johannesburg: Delta Books, 1982) 23-60.

> The natives of South Africa could in most instances obtain an ample and consistent supply of nutritious food if he (sic) exercised a little energy and forethought. But as he is proverbially improvident, and as he has to contend with erratic seasons, it often happens that he has only a very indifferent diet upon which to exist. ... It is their improvidence, combined with a constitutional ability (sic - inability?) to commence work except under compulsion, which causes the natives in many parts at certain seasons of the year to deteriorate physically.[3]

This was the view which mine managers and health authorities assumed in their approach to feeding miners. Turner's work influenced the ration schedules which the mines drew up - schedules which the miners constantly complained about. Thus in his articles Turner put forward two "facts" that were to affect miners detrimentally throughout the period under discussion. The first was the belief that the rural African usually took two meals a day, one at about 10.00 a.m. and the other at sunset. The second was that Africans could travel long distances on low rations:

> It would seem that certain races on account of their anatomical development are pre-eminently suited to withstand prolonged periods of famine.[4]

Apparently this conclusion convinced the managers that African miners could work effectively for long periods underground without food, an idea that was only repudiated at the end of the 1930s when Dr A.W. Goldsmith argued that

> it was a common idea that natives only ate one meal a day, and it was indeed true that, living under their natural conditions they only cooked once a day. However, food left over from the evening meal was eaten in the morning, and raw fruit and vegetables were eaten at frequent intervals where they were available.[5]

Coupled to the above two myths was the assumption by "white authorities lacking knowledge of 'traditional' African diets...that Africans were used to living on mealie meal".[6] Thus, as will be shown

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[3]Turner, "Diet of the South African Natives" 183.

[4]Turner, "Diet of the South African Natives" 184. Throughout Africa colonialists have assumed that Africans were happy to walk long distances. In Ghana, for example, cocoa producers had to walk extremely long distances to get to market.

[5]Goldsmith, A.W., "Some Observations on Compound Feeding with a Recommendation for the Early Opening of Compound Kitchens," in Proceedings of the Transvaal Mine Medical Officers' Association 17 (1938): 59-63.

[6]Packard, White Plague 57.

later, the dominant foodstuff in the recommended minimum diet schedules issued by the state was mealie meal. Finally, Turner expressed an opinion that was by no means unusual when he argued:

> It must not be forgotten that the average native is an untidy individual, and that food waste is removed daily...[I]t is impossible to prevent a good deal of porridge being scattered about after each meal. At any rate, the very fact of food being wasted indicates at least that the natives were not being underfed.[7]

The above quotation is a good example of the paternalistic view that dominated the mine managers' approaches not only to miners' diets, but to miners generally.

Dr H.A. Loeser, whose views on the diet of rural Africans were in line with Turner's, nevertheless considered that the diet they received on the mines was inadequate. He noted that whereas a soldier in the American army during times of war received 4 199 calories per day, a miner's ration was equivalent to only 3 820 calories yet the miner did far more work. Nevertheless, his view of the rural African was no different from that of Turner's. He concluded that as

> the male native in his kraal does as little work as he possibly can, his physical exertions are usually slight, the amount of food he requires is proportionally small. But when he comes to the large industrial centres for work, he often undertakes great muscular exertion, for example,...drilling and tramming in the mines.[8]

The search for the diet that would produce the most efficient workforce had curious twists. An example of this was that in 1936 the South African Institute of Medical Research (SAIMR) circulated amongst the compound managers a paper entitled "Lucerne as a food for human consumption". Luckily for the miners the idea was never accepted.[9] Although these changing views on "native diet" were to dominate the actual changes in the diet provided, it will be shown that the consumers' views also influenced matters. Differences in individual mines' approaches to the diet will also be noted. Finally, it should be borne in mind that throughout the period under discussion the mining industry never provided eating

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[7]Dr G.A. Turner quoted in COMAR (1910) 28. See also Buckle's comments on food in UG37-1914 6-17. There is a significant difference between quantity and quality. Miners were generally given sufficient quantities of food but were seldom given food of much quality. It will be shown below that large amounts of mealie meal led to malnourishment.

[8]Loeser, H.A., "Diet of Mine Natives," Transvaal Medical Journal 7 (March 1912): 152-163.

[9]COMAR (1936) 26.

halls for miners to eat in. Miners "drew their rations in tin bowls and mugs and ate squatting on the cement paving of the courtyard or sitting on the bunks in their sleeping quarters".[10]

Meal Times

Once they had finished their shift, miners would often have a long wait before the kitchens opened so that they could have their main meal of the day. Some would open as early as 12.00 noon whilst others opened as late as 5.15pm.[11] Thus, on some mines the miners were able to get their first, and usually sole, meal of the day late in the afternoon. Many miners asked the Native Grievances Inquiry (1913-1914) that, despite the fuel shortage on many mines, they be given uncooked food or rations which they could prepare themselves. The request was rejected on the basis that they would live off expensive tinned food bought from the trading stores. We know in fact that if the food had been better, an improvement which the miners felt could be achieved by preparing it themselves, they would not have had to frequent the stores. The mine managers' paternalism again reared its head when the commission declared that the idea of African men cooking for themselves was unacceptable. Miners were seen to be unable to cook for themselves, despite mines issuing raw meat.[12]

The Report of the Witwatersrand Mine Natives' Wages Commission on the Remuneration and Conditions of Employment of Natives at Transvaal Undertakings of Victoria Falls and Transvaal Power Company, Ltd. (Lansdown Commission) agreed with this line of thought when it argued that "the natives would certainly not provide themselves with the ...well-balanced diet which they presently enjoy...In general, little or no attention would be paid by the native labourer to the vitamin content of what he eats or its nutritious value".[13] A further objection arose from the mines' realization that they

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[10]Simons et al. 84.

[11]Goldsmith 59-62. Goldsmith found, on the mines he investigated, that about 10 per cent of the miners, after their shifts, waited between 2.5 and 3.5 hours before they were fed, whereas 53 per cent waited between half an hour and 1.5 hours before they were fed. All of which depended on the compound the miners were housed in.

[12]UG37-1914 16-17.

[13]UG21-1944 30.

could feed the miners cheaper than the miners could feed themselves as the result of the mines buying wholesale. Wilson makes the important point that when evaluating this situation one should "bear in mind that a man who has come to town to earn money to feed and clothe his family might, in order to save more, prefer to buy less food for himself".[14] Furthermore, he points out that the diamond mines did not provide food for their African workers, with no major disruption to production.[15] A crucial influence on purchasing food was whether suitable shops were easily accessible, which at many mines was not the case.

Morning Meal

For much of the period under discussion most mines did not provide a morning meal to African miners. Mention has already been made of how much of the mine managers' understanding of the miners' diet came from dubious anthropological "evidence" about the eating habits of Africans in the reserves. Consequently, it was felt that a morning meal was unnecessary. By the 1930s this opinion had changed and Orenstein argued that

> it is recognised that it is the custom and habit of the natives to have only one large meal a day, but this custom has grown up under conditions radically different from those under which the natives live and work on the mines. The large output of energy required of the average native working on the mines cannot be adequately provided for by one large meal a day, and compound managers and staffs would perform a service of the highest value, both to the natives and to the mining industry, if they would bend their energies towards educating the natives to take a substantial meal before going underground, and to eat some food about the middle of the shift.[16]

Miners continually complained that they went to work hungry, but they were dissuaded from eating early in the morning as this would have meant waking even earlier and consequently an even longer wait before they were lowered down below. Nevertheless, the returns from a questionnaire sent out by the Chamber in 1935 suggest that the miners themselves were very enthusiastic about receiving a morning

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[14]Wilson 56.

[15]Wilson 57.

[16]Orenstein, Notes on Elementary Hygiene 34-35.

meal.[17] This enthusiasm should be seen against the background of the common complaint that there was not enough food provided on the mines. But although miners were keen to receive the morning meal they were apparently opposed to taking the meal down below. Miners when asked about it replied that they were not rats and that they did not "want to eat their food in holes like rats". A further objection was that they felt the food would smell of the mine.[18] In 1938 the Mine Medical Officers' Association was still debating whether not all miners on the day shift should be fed before going underground. Nevertheless by the 1930s almost all the mines issued bread to African miners just prior to their descent.[19]

Scurvy[20]

Scurvy is the disease most often associated with poor nutrition. Deficiencies in vitamin C (ascorbic acid) prevent the body from healing wounds and can result in weakened bones, anaemia, loss of teeth and bleeding. Poor nutrition levels would usually compound the problem, increasing the likelihood of miners acquiring not only scurvy but a host of other diseases as well. Furthermore, flesh wounds, extremely common as a result of the nature of underground work, would take much longer to heal, thus increasing the likelihood of acquiring septicaemia. Scurvy is potentially fatal, but is usually cured by rapidly increasing the patient's intake of ascorbic acid.[21]

It is therefore not surprising that poorly fed miners who often worked long shifts on empty stomachs

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[17]COMA, minutes of a meeting of the Health Advisory sub-committee, 4 June 1935.

[18]COMA, S. K. Mkennie, employee of Crown Mines, to W. Gemmill, Chamber of Mines, 3 July 1933. On the Kimberley diamond mines black miners were given an hour for lunch (Turrell 154).

[19]Goldsmith 59. The AMWU complained to the Lansdown Commission that on many of the mines the miners were still only receiving bread before going underground. Furthermore, they complained that the issuing of hot drinks, with the bread, did not always happen on all the mines ("Comparison of Complaints" 7).

[20]For a useful discussion of scurvy on the mines see Baker 190-196. See also Packard, White Plague 166-171.

[21]Ascorbic Acid was identified in 1907 (Harrison, T.R., (ed) Harrison's Principles of Internal Medicine. 10th ed. [New York: McGraw-Hill, 1984] 466-468). Apparently the prescribed method of treatment for scurvy patients, on the mines, was "the intravenous injection of neutralised orange juice" in emergency (Orenstein, "Report for the Year 1936" 32-33).

were susceptible to scurvy. The fact that ill miners appeared weak and listless, meant that scurvy symptoms were often mistaken by the compound managers for malingering.[22] Doctors have known since the middle of the eighteenth century how to cure scurvy but the mines were not always willing to use an expensive cure. Mines therefore repatriated miners with scurvy as it "would save an infinite [amount] of trouble, time, expense and worry to the mines".[23] As Packard has correctly noted, repatriation "directly contradicted the claim that mine diets were better than those in the kraals and lays bare the underlying reason for quick repatriation - the desire to keep mortality rates on the mines down".[24] This policy naturally meant that African miners arrived at their homes, if they had not died on route, ill and ultimately became a further burden on the rural economy already under siege.

Scurvy was not eradicated by the generally improved compound conditions that occurred as the century wore on. Incidence of the disease, as well as resultant mortality rates, were at their highest immediately after the South African War. High food prices and famine during the war, coupled with the poor compound conditions, were the primary reason for the death of 229 miners (3.4 miners per 1 000 employed and 5 per cent of the total deaths that year) from scurvy on the gold mines. The following year the scurvy mortality rate was halved.[25]

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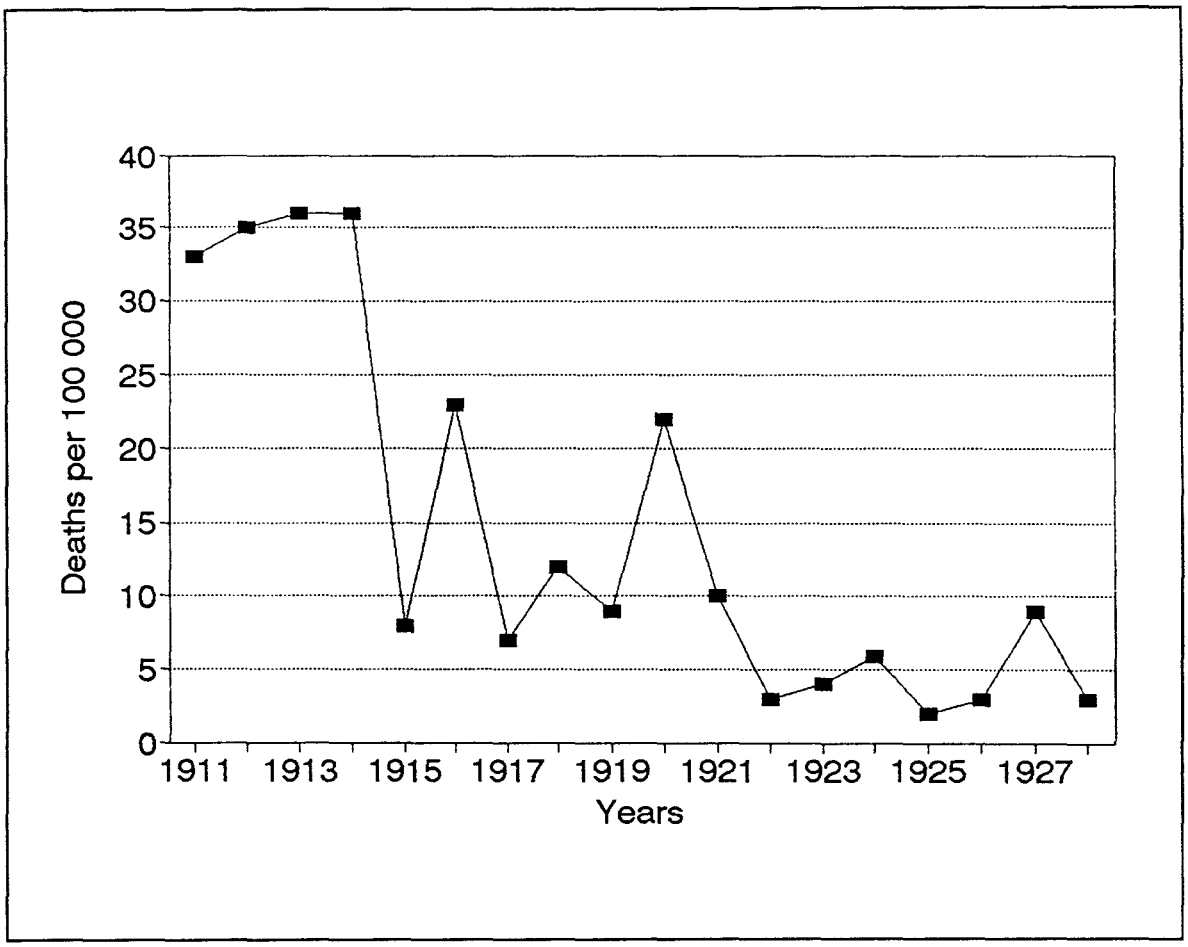
[22]Donaldson, S., "The Clinical Side of Scurvy in the Mine Native Labourers," Medical Journal of South Africa 16 (April 1921): 169-174. Baker also has evidence of this phenomenon (186).

[23]SAB, GES, 160 407/14/13, letter to the Director of the GNLB from Mr Edmontson, mine inspector, 29 April 1915. Fifteen years later Sir Edward Thornton, Acting Secretary for Public Health, reported to the 1930 Low Grade Ore Commission that "certain mines send cases to WNLA hospital in an acutely ill condition in the hope they might slip through and be repatriated". Thornton was referring to the practice whereby scurvy patients were misdiagnosed and repatriated on the basis that the patient was suffering from something else. Miners dying of scurvy seldom survived the trip home (COMA, "Statement on scurvy by Sir Edward Thornton, Secretary for Public Health to Low Grade Ore Commission, 1930"). In response to Thornton's statement the MMOA remarked that "scurvy seems to be causing a needless amount of alarm in the minds of the Government Medical Officers of Health" (COMA, comment appended to the Thornton statement).

[24]Packard, White Plague 81.

[25] COMAR (1904) 94-95. Cartwright, for the period November 1902 to 1905, gives a far less frightening figure of 186 deaths from scurvy on the Rand (Cartwright, Doctors on the Mines 17).



Graph 3: Number of African Miners, per 100 000, who Died from Scurvy, 1911-1928. *Source: Thornton "Statement on Scurvy".*

Although death from scurvy declined in the decades following, incidence of scurvy remained high into the 1920s and early 1930s.[26] Central Mining-Rand Mines Group, for example, reported 1 771 cases of scurvy in the period 1920 to 1929.[27] The continual high incidence of the disease prompted the industry to commission the South African Institute for Medical Research (SAIMR) to do research on it in the 1920s. The SAIMR recommended that the cooking time of all vegetables be drastically reduced to

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[26]By 1921 scurvy's mortality rate on the mines was 0.11 per 1 000 black miners employed and by 1928 it was 0.02 per 1 000 miners (SAB, GES, 904 118/702/13, E.H. Cluver's report entitled "Health Conditions on the Witwatersrand Gold Mines 1928, Native Rations," to the secretary for Public Health for the Union, 30 October 1928).

[27]Orenstein, "Report for the Year 1936" 30. In the same period 39 black miners employed by this group died. 1920, for both incidence and mortality, was the worst year, no doubt as a result of both the spanish influenza weakening miners the previous year and the precarious economic situation of the mining industry. The latter probably led to many mines adhering more closely to the minimum ration schedule rather than over-cater.

ensure that the vitamins were not destroyed.[28] The diet issue was also influenced by food preparation techniques. Miners constantly complained that food was overcooked. This was borne out by a compound manager remarking to the NGC that the cooks "boil it [food] from about eight in the morning until three in the afternoon so it is pulp".[29] The inadequate ration of vegetables was thus further nutritionally degraded by the destruction of vitamin content through boiling for many hours, a procedure that occurred well into the 1920s.[30] The vitamin C content especially was destroyed and the miners' likelihood of acquiring scurvy subsequently increased. Scurvy incidence did begin a notable downward trend in the 1930s.[31]

High incidences of scurvy amongst African miners in the period immediately after the end of the South African war led the Chamber of Mines to recommend that every day each miner should receive the following: 907 grams of mealie meal, 453 grams of beans, 567 grams of meat, and a pint of coffee. Furthermore, each miner was to receive four pints of "kaffir beer" and a glass of lime juice each week. Finally, the Chamber recommended that Mozambican miners receive 454 grams of rice daily in lieu of mealie meal.[32] The following year, the Chamber of Mines included in its survey of mine compounds questions about the diet issued to African miners.[33] The questionnaire revealed that only 64 per cent of the mines provided vegetables with the daily meal more than five times a week and that the remaining

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[28]Orenstein, "Report for the Year 1936" 29. See also Malan, M., In Quest of Health (Johannesburg: Lowry Publishers, 1988) 293-296.

[29]TA, K358, evidence of A.H. Pigg to the NGC, 5 February 1914. The fact that this over-boiling occurred also illustrates that kitchens were not regularly inspected by the NAD. Had they been, such procedures might have been discontinued earlier.

[30]SAB, GES, 904 118/702/13 letter from E.H. Cluver to the secretary for Public Health, 30 November 1928. A Dr E.M. Delf, attached to the SAIMR, discovered that vegetables lost 80 per cent of the vitamin C content when subjected to temperatures between 175°F and 212°F for more than twenty minutes (Cartwright, Doctors on the Mines 142).

[31]Packard argues, correctly, that a major reason for this downward trend was that mine owners were able to be more discerning over the workers they chose as they had a surplus of labour to choose from (White Plague 161).

[32]COMAR (1903) 43.

[33]This is the same questionnaire that was discussed in the previous chapter. 92 mines were sent the questionnaire.

36 per cent either failed to provide vegetables at all or did so infrequently.[34] Each week every miner on 38 per cent of the mines received almost a kilogram of meat (more than 720 grams) whilst the remainder of the mines provided each miner with less per week.[35] Finally, the Chamber found a wide disparity between individual mines' approach to the distribution of beer. Allocation ranged from as little as one pint per month to as much as two pints per day. The Chamber's study again illustrates the enormous differences in approach by different mines to the diet question. Unfortunately it is difficult to conclude much from the above, as information in the questionnaire is somewhat vague, save confirming that many miners were poorly fed.

On most mines food was given to all miners, regardless of whether they were working or not, but on a few isolated mines this was not the case. Mines belonging to Consolidated Gold Fields and J.B. Robinson were known not to serve food to "loafers". In other words the two mines were using food as a method of control. Miners who completed their stipulated length of hole were rewarded with wages and food, while those who did not, "loafers", were not only not paid but were also not fed. Both the NAD and the Chamber condemned this practice.[36] Coupled to this system was the practice of marking the miners' tickets after they had received their daily meal. The majority of the mines did this, ensuring that most miners only received one helping of food. However there were some mines that did not have this system, and miners were able to get as much food as possible. The reason why most mine managers preferred the former was that "if the boys could come to the kitchen as often as they wished, they would get more food than was good for them. It would be an extravagant and costly way of doing things".[37] Compound managers who did not use the ticket system argued that "boys should be

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[34]In 1902 the Chamber had discovered that only 40.38 per cent of the gold mines supplied vegetables with their meals for miners. Therefore within two years some significant improvement had occurred [COMAR (1904) 26-40].

[35]Note, for comparison's sake, that one hamburger patty weighs about 60 grams. Therefore 720 grams is equivalent to about twelve a week, almost two a day. See also footnote 47 for some comparisons.

[36]Moroney, Honours dissertation 54-58.

[37]Quoted in Goldsmith 62.

encouraged to get all the food they wanted and not be treated as slaves".[38] Dr Goldsmith concluded that "there is no question as to which the boys prefer".[39] Certainly a system of control at meal times was in keeping with the general level of control compound managers found desirable on the mines.

State inspectors blamed both the compound managers and the miners for the incidence of scurvy. Compound managers were blamed for overcooking the vegetables, while miners were blamed for being either malnourished on arrival at the mines or for not eating the food served to them. In the following chapter reference will be made to the "victim blaming" that occurred within the health system on the mines. Nevertheless the fact that scurvy reappeared at any "temporary losses of adequate supplies of vitamin C strongly indicates that subscorbutic conditions were widespread and that the line between low chronic vitamin deficiency and scurvy was rather thin".[40]

Indeed new recruits from the reserves which were in a state of economic degradation often arrived in a weakened state. But according to mine authorities, "in the lazy life [Africans] live in the kraals, scurvy may not develop", whereas "they develop scurvy during work".[41] Older or more seasoned miners allegedly acquired scurvy not because of the inadequate diet, but because they had "attained a certain feeling of independence" and therefore discarded "the anti-scorbutic specially provided".[42] However, it was incorrect to blame the miners for acquiring scurvy as Dr F.W. Fox, the eminent dietician, discovered after investigating scurvy between 1929 and 1939 under the aegis of the SAIMR. He found that "in the very large majority of the cases, the disease breaks out after quite a considerable stay on the mine, as a result of the Native's reaction to mine conditions; in other words, it must be regarded as a

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[38]Goldsmith 62.

[39]62. The Report of the Witwatersrand Mine Natives' Wages Commission, UG21-1944, was also of the opinion that the marking of tickets at meal times was not a good idea (30).

[40]Packard, White Plague 170.

[41]COMA, E.H. Cluver's report on "Native Rations" to the secretary for Public Health for the Union, 30 October 1928.

[42]SAB, GES, 904 43/43/13, letter to acting secretary for Public Health for the Union, from Dr E.H. Cluver, 15 May 1931.

disease of mine life".[43]

Diseases associated with poor nutrition are also aggravated by the nature of food preparation. Dirty dishes, flies and improper storage facilities will all contribute to outbreaks of diseases such as cholera and typhoid. In the previous chapter mention was made of inspectors reporting dirty kitchens. In 1914, after inspecting several kitchens on the mines, Buckle declared that "some...are most unappetising places; and a good many of the meals which I have seen served must have contained, before they were eaten, a proportion of dust".[44] Three decades later the AMWU complained to the Native Mine Wages Commission that miners still found the food dirty, and on one particular mine the meat was cut on the floor and not washed before it was cooked.[45]

State Ration Schedules

The type of food issued to the African miners was determined by the ration schedules promulgated by the State. The 1911 Native Regulation Act gave the State power to implement and enforce such schedules. The schedules, below, indicate the minimum amount of food that the mines could issue without being prosecuted. The ration schedules can be outlined as follows:[46]

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[43]Quoted in Packard, White Plague 169 (Packard's emphasis). On the Central Mining-Rand Mines Orenstein found that 24.7 per cent of the scurvy cases were amongst miners who had served more than twelve months on the mines (White Plague 169).

[44]UG37-1914 16.

[45]"Comparison of Complaints" 7.

[46]Coloured Labourers Health Ordinance of 1905; Act no. 15, Native Labour Regulation Act, 1911; Government Gazette no.1109 of 10 December 1920, amendment of Regulation 16 of schedule 111 of Native Labour Regulation Act; Government Gazette, no.37 of 5 January 1922, amendment to schedule of rations published under Government notice no.2241 of 1920. Note that the approximate weights of the different foods have been converted from ounces to grams.

Food Type	1905	1911	1920	1922
		(grams per day)		
Mealie Meal	907.0	568.0	681.6	681.6
Meat/Fish	130.0	194.4	194.4	194.4
Soup Meat	65.0	/	48.6	48.6
Vegetables	65.0	162.1	142.0	142.0
Sugar/Treacle	65.0	65.0	28.4	/
Salt	14.0	14.0	14.0	14.0
Bread	/	227.2	170.4	170.4
Beans	/	113.6	85.2	85.2
Peanuts	/	89.3	56.8	56.8
Coffee/Cocoa	/	/	7.1	4.7

Equivalent examples: 100 grams of mealie meal makes a large plate, 1 medium sized apple weighs about 220 grams, 3 teaspoons of sugar weigh about 30 grams, 1 thick slice of bread weighs about 50 grams.

Table 3: State Ration Schedules

The schedule introduced in 1911 was strangely the "best" year all round, for the 1920 and 1922 schedules had certain amounts of food decreased. A possible reason for this, as the first chapter illustrated, was that the mining industry was in a far stronger economic position in 1911 than in the early 1920s and could therefore afford more "generous" rations. These were, of course, minimum ration schedules and individual mines could offer more food.

The above schedules recommended enough calories, but these were mostly provided by mealie meal, a fact which Gorgas had noticed with considerable surprise. He had never seen a diet before that relied so heavily on one ingredient and argued that this was an over-reliance on carbohydrates.[47] The miners also recognized this, and in 1923 3 000 miners picketed the kitchen at the Wolhuter Gold Mine. Their complaint was that the mealie meal was of such poor quality they could not stomach it.[48] Dr Orenstein had noted that the ration schedules provided enough amounts of protein but that it was not the correct type of protein. In other words the "absence of milk and the absence of cereals rich in proteins absorbable by the human digestive system reduce the value of the protein to 40 per cent".[49] Also significantly absent were anti-scorbutic vitamins, crucial in preventing scurvy. Although originally present in the vegetables, they were destroyed by cooking.

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[47]Gorgas 348.

[48]Rand Daily Mail, 24 February 1923.

[49]Orenstein, "Compound Sanitation" 8.

Some mine doctors were highly critical of the ration schedules. Dr Orenstein, for example, considered that while the regulations were "well proportioned in respect of carbohydrates and proteins" they were "deficient in fats".[50] He claimed this deficiency played a crucial role in the "prevalence of such infectious diseases as pneumonia, and perhaps even of tuberculosis, among our native force".[51] The 1934 TB Research Committee's report also expressed concern at the unsuitability of the mine diet. It highlighted the absence of essential vitamins, especially of Vitamin A (which helps prevent infection) and of Vitamin D, as the result of a work environment where the workers never see the sun. Furthermore, concern was expressed at the absence of milk or butter, especially as many of the miners came from cattle-owning cultures.[52]

In considering the various diet schedules it is important to remember that in many instances they were not adhered to. Moreover, despite a number of inspection reports that prove that the schedules were ignored, there is no evidence that the State prosecuted any mine. Baker cites a number of examples of inspectors' reports that show that rations distributed fell far short of the stipulated amounts.[53] In 1914, for example, "an inspector reported that on the East Rand Property Mines the weekly meat ration was short by 6,876 pounds and the vegetables by 12,129 pounds. In May 1917, inspectors accused the New Goch G.M.Co. of holding back 2,602 pounds of meat, 789 pounds of bread, 7,294 pounds of beans and 5,262 pounds of peanuts".[54]

Despite the regulations implementation varied enormously. Some mines, for example, provided a limitless supply of porridge, whereas on other mines the miner had to show his work ticket, which was

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[50]Orenstein, Notes on Elementary Hygiene 33. Peanuts, of course, provide some fats but apparently black miners were not used to them and therefore did not always eat them.

[51]Orenstein, Notes on Elementary Hygiene 34.

[52]COMA, TB Research Committee Report, 1934.

[53]Baker 199.

[54]Baker 199. The first inspection can be found in TAB, GNLB, 57 1994/12/D180, Inspector, NAD Boksburg, to Manager, East Rand Property Mines Ltd., 28 October 1914. Unfortunately Baker does not provide a reference for the inspection of the New Goch gold mine.

then stamped to prevent him from collecting more. Miners detained underground were often unable to collect food, as the management did not save it for them, nor were their room mates allowed to collect it as they did not have the absent miners' tickets.[55] In his 1914 report on native grievances, Buckle was surprised to find on more than one mine "no system for deciding the amount of mealie meal to be cooked every day...the issuer seemed to be roughly guessing what would be wanted".[56] Mismanagement would invariably increase the mine's expenditure on food. Furthermore it would also lead to a disenchanted workforce if insufficient food was prepared.

A common complaint was that miners were all forced to eat the same food regardless of where they came from. The "East Coast" miner, for example, apparently preferred rice and fish to meat and mealie meal; the Amaxhosa objected to eating intestines because "it is women's food"; whereas the "Basuto do not like to eat certain organs, eg...stomach". In 1943 the AMWU noted that every miner "buys his own food when he can, and leaves the mine food 'because it is bad '". Miners also claimed, according to the AMWU, that the quantity of food was insufficient.[57]

Part of the meat ration was sometimes supplied raw, which miners cooked on stoves in their huts. One complaint about this was that the meat was issued per hut, which meant the elders would get the larger portion. Mines did not always provide fuel for the stoves that the meat was cooked on.[58] Significantly absent from the above ration schedules was fruit. Fruit was ruled out because it was too expensive, since it apparently cost double what vegetables cost.[59] While a hot drink of cocoa may have

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[55]UG37-1914 16.

[56]UG37-1914 16.

[57]"Comparison of Complaints" 6-7.

[58]UG37-1914 17.

[59]Orenstein, "Compound Sanitation" 1-19. Baker records that, at 1917 prices, a halfpenny's worth of fruit per day per miner would have cost the mines annually £150 000 (202). Phimister also noticed that food imported at great cost into Southern Rhodesia was seldom given to the miners. Furthermore, miners also had to supplement their diets by buying food from stores or eating houses. Interestingly, he noted that mines increased the daily rations and expanded the variety of foodstuffs given to the miners at times of labour shortages so as to attract more labour. Finally, mineowners in Southern Rhodesia refused to implement the ration schedules in use on the Rand, as these would have dramatically increased the production costs (Phimister,

seemed like an appropriate drink with which to start off one's day from the management's point of view, it was not so from the miners'. They would have preferred hot soup.[60]

Management was convinced that despite miners' continual criticism of the food provided, it was of benefit to them. It was claimed that 90 per cent of the miners put on at least 10 lbs during their stay.[61] Miners denied that the reason they put on weight was because of the good diet, and claimed that it was due to buying food from the trade stores.[62] Research completed by the early 1920s suggested that miners lost 4 to 5 lbs when drilling for about four hours, while during tramming they lost about 1½ lbs per day. Management noted the weight loss during work but argued that the meals provided by the mines not only replaced lost body mass but in fact supplied extra nourishment which led to the weight gains.[63] But the true reason for these weight gains was the predominance of mealie meal. When consumed in such large quantities a carbohydrate such as mealie meal would undoubtedly lead to weight gains. Yet weight gain does not necessarily signify either a balanced diet or a healthy workforce. Other factors, such as the incidence of diseases, must be taken into consideration before one can argue convincingly that the workforce was healthy by the 1930s.

Trading Stores

Evidence before the 1907 Mining Industry Commission showed that while a miner earned about £15 in six months he might spend as much as £10 on food in that period at trading stores.[64] Despite this

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I.R., "African Labour Conditions and Health in the Southern Rhodesian Mining Industry, 1898-1953. Part II: Diet," Central African Journal of Medicine 22 [April 1976]: 63-68).

[60]TAB, GNLB, 52 1994/12, letter from the Portuguese Curator of Natives to the Director of GNLB, 22 June 1915.

[61]COMAR (1937) 49.

[62]Evidence of Ikaneng, 1943.

[63]Orenstein, "Compound Sanitation" 7. Orenstein explained that the research had been undertaken to establish what amount of food was sufficient to obtain maximum production out of the miners.

[64]Trading stores sold a variety of goods ranging from food to boots to soap, blankets and musical instruments. Situated close to the mine, the stores were notorious because they charged much higher prices than the shops in the surrounding towns. For more details see Callinicos 1: 56.

finding the use of such stores was evidently misunderstood, one manager observing that miners' utilisation of such facilities was "more like a school boy going to a tuckshop than due to the fact that they are underfed".[65]

The trading tactics utilised by these stores were generally exploitative. Little competition and a captive clientele meant the storekeepers charged high prices. The miners were well aware of this and boycotted the stores in 1919. The boycott started at the Van Ryn mine, but soon spread. The major grievance of the miners was that their wage was not high enough to pay the stores' inflationary prices. A government commission into the grievances found that on average the traders were making about 28-30 per cent profit on each item they sold. The storekeepers claimed that the reason that they charged so much was that they had to pay very high rents to locate their premises outside the mines, but in response the commission argued that the storekeepers had a captive clientele which had no choice but to buy from them. The issue that really upset the miners was the traders' practice of not fixing the price of the goods sold in the store.

> The storekeeper makes as big or as little profit as the circumstances will permit. For certain goods the trader as a rule asks a much higher price than he is prepared to take: if he gets it, well and good; if not, he comes down to the lowest margin he can sell at rather than lose a customer.[66]

The traders' defence of this tactic was that "the prices are not fixed because the kaffir is not like a white man in purchasing goods, he bargains for everything". The commission rejected this plea from the traders and supported the miners' case for reducing the prices in the stores, arguing that there should be fixed prices in trading stores.[67]

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[65]Quoted in Baker, 215.

[66]The above information was based on the Report of the Special Commissioner, Mr A. H. Stanford: appointed to enquire into the boycott, UG4-1919. See also Bonner 273-297. According to Bonner, this boycott contributed to the mood of discontent on the mines which ultimately boiled over and led to the 1920 strike. Wilmot James in his discussion of the 1946 strike has also noted how inflation, coupled with a change in diet, provided the spark for labour unrest ("Grounds for a Strike").

[67]For more details on the boycott, see the 1919 report; and COMAR (1920) 155-157.

During the commission's enquiry the mining industry showed considerable sympathy for the beleaguered miner, a concern that was undoubtedly related to fears that high prices and resultant boycotts would threaten labour stability. Furthermore, since the major grievance was that the miners wanted increased wages to be able to buy from the stores (and not necessarily a decrease in store prices), the industry was keen to defuse the situation as quickly as possible. The outcome was beneficial for the miners. The industry began to buy goods in bulk from wholesalers and to resell the goods to the miners at cost price, an action that undercut the traders completely.[68] However, the issue of wages remained unresolved and the following year the miners went on strike (see chapter two).

The problems that miners had with these stores did not end there, for a decade later the government set up another commission to investigate the granting of municipal licenses to trading stores on the Rand. It reported in April 1935, concluding that the stores were "inadequate" in number and that the lack of such facilities imposed "inconveniences and hardship" on the mining industry's labour force. Furthermore, the commission stressed that "the spending capacity of mine Natives is larger than has been assumed" and therefore more licenses should be granted to increase the number of stores.[69] The issue that upset the Chamber was the fact that too few stores meant that miners had to travel to the nearest towns which, as mentioned in earlier chapters, was not desirable from the mines' point of view. Despite the anxiety they had caused the industry sixteen years previously, trading stores were still seen to be an essential component of the mining context. At these stores miners were able to buy not only food, but also the goods they traditionally took home with them: trunks, clothes and utensils, which are so evident in photographs from the period. In other words, miners were able to spend their wages with minimum disruption to production if they were able to do so at the trade stores as opposed to travelling to towns. Furthermore, there may well have been a realisation amongst the industry that the stores played an

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[68]Mines were later prevented from selling goods wholesale to miners by the courts. The traders successfully petitioned parliament and by 1926 were able to continue operating trading stores in the vicinity of the mines. Shops run by the mines were declared illegal "by reason of section ninety-seven of the Transvaal Precious and Box Metals Act, 1908 Amendment Act, 1926" (UG21-1944 37).

[69]Quoted in COMAR (1936) 80. The mining industry argued that although there had been a 40 per cent increase in the number of African miners employed in the previous ten years, there had been no increase in the number of trade stores.

essential role in supplementing the miners' diet. Lack of access to stores would therefore have ultimately affected the miners' ability to work. Yet despite this finding by the commission, the government went ahead and introduced a Bill that did not "embody any of the recommendations of the commission".[70]

In addition to food provided by the mines and bought from the stores, food may also have been obtained through illegal methods such as stealing. Evidence for this has yet to be found on South African gold mines, but case studies exist from other African countries where such survival techniques were common. There does not seem to be any evidence of miners trying to grow their own food in the compounds, an activity witnessed on the Southern Rhodesian gold mines during the colonial period.[71]

Economics

An important element of the mining industry's defence of the low wages paid to African mineworkers was the fact that it provided "free" food and housing for workers. Wilson has argued that it is difficult to verify this statement because the debate "about the cash equivalent of wages in kind has long been bedeviled by dispute as to the difference between the cost of such earnings to the industry and their value to the recipient worker. The figure used can so easily depend upon what one is wanting to prove".[72] Certainly the amount of money spent by the industry was influenced by inflation, especially after World War One. Figures presented by the officials were invariably the cost to the mines, and, as in other areas, the value to the miners was seldom given.

According to Baker the Chamber of Mines had opposed the idea of a ration schedule being introduced as part of the 1905 Coloured Labourers Health because "the industry was concerned about assuming

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[70]COMAR (1936) 80-82.

[71]See, for example, van Onselen, Chibaro 45.

[72]Wilson 56. Van Onselen has also recorded how mine owners in Southern Rhodesia propagated the myth that they provided "benefits" for the African miners (Chibaro 73).

additional financial burdens".[73] In 1902 the mines, on average, spent 3.8d on food per miner per day, and the total food bill for the mines was £128 617.[74] At the time of the 1913/14 Native Grievances Commission the mines spent on average between 4d and 6d on each miner per day.[75] By the time of the 1932 Economic Commission the mines were spending 3.85d on each miner's food per shift completed and the total food bill for 1930 was £1 046 713 as a result of inflation and more miners to feed.[76] By 1939 the cost had risen to 5.28d per completed shift.[77]

In an effort to achieve greater savings most mines baked their own bread by the end of the First World War. One implication of this was that mines were able to determine the ingredients of the bread; the result was that bread baked by the mines had a much higher mealie meal content than bread baked elsewhere on the Rand. Mealie meal has almost always been far cheaper in South Africa than wheat, as a result of the latter being partly imported. A 1918 survey of the mines discovered that more than half the mines produced bread with a mealie meal content of between 65 and 95 per cent.[78] Apart from mealie meal having far less protein than wheat, and the fact that the diet schedules were dominated by mealie meal, it was difficult to digest and the bread became sour within 24 hours. The NAD was particularly concerned about the use of this bread and during the 1920s managed to persuade the mines to decrease the quantity of mealie meal in the bread and increase the use of flour.[79]

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[73]Baker 198.

[74]COMAR (1902) 467.

[75]UG37-1914 17. Van Onselen records that the Southern Rhodesian mining industry spent similar amounts per miner per day - between 4.5d and 7.6d. However food was more expensive in Southern Rhodesia than in South Africa, hence they bought less. The bulk of the diet was also mealie meal and meat (Chibaro 43).

[76]Report of the Low Grade Ore Commission, UG16-1932 32.

[77]UG21-1944 30. In 1943 inflation had increased the cost of feeding the miners dramatically. The mines were forced to spend about 18d. on each miner's food per day (Jeppe 1: 1761).

[78]Baker 200.

[79]The regulations stipulated that bread should contain, at least, 64 per cent wheaten flour and not more than 36 per cent mealie meal (Orenstein, "Report for the Year 1936" 32.). See also Baker 201.

Conclusion

Most of the miners' attempts to change their diet failed. Furthermore, as in other aspects of compound life, no attempt was ever made to ascertain what miners would have preferred to eat. On the whole there was a depressing continuity in the diet given to miners throughout the period under discussion. Not only did poor food lead to many miners acquiring scurvy, but it also led to weakened miners becoming more susceptible to a range of diseases, which are discussed in the following chapter.

Chapter Five

"Too much guinea-pig and too little human being": Pulmonary Diseases on the Mines.[1]

> Illness is a process, it takes place over time, inducing different thoughts, actions and interactions not only in the patient but also in family members, medical practioners and others.[2]

TB, which has probably accounted for more deaths than any other disease on the gold mines, has been well covered by Randall Packard's recent book, White Plague, Black Labor. Packard, whose approach to TB has provided a useful model for the present study, tends to underplay the importance of pneumonia as a major illness on the mines because he believes that many of the reported pneumonia cases and deaths on the mines were simply misdiagnosed cases of TB. It is obviously impossible to check diagnoses of 60 or more years ago. However, the very fact that so much energy and money was devoted to combatting pneumonia suggests it deserves more discussion, especially as the mine authorities' approach to pneumonia evidently hindered any real solution emerging for the control of TB. The one cannot be discussed without reference to the other. Furthermore, the incidence of silicosis (miners' phthisis) should also be considered when discussing TB.

According to health records, TB and pneumonia were the major killers on the gold mines. The importance of silicosis remains relatively unknown owing to the absence of reliable records and the mines' practice of repatriating, or refusing employment to, miners who showed symptoms of silicosis. However, it was the high mortality rate from pneumonia that forced the government to ban the recruiting of Tropicals in 1913. The severing of a major labour artery forced the mines to take stock of their high mortality rates. The solution was to prevent deaths from disease. But what was not so clear was how this was to be achieved. Further environmental reforms would have been very expensive, so

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[1]Dr F.J. Allen's opinion of the experiments which tested vaccines on African miners. Quoted in "Transvaal Mine Medical Officer's Association," South African Medical Journal, (April 1935) 242.

[2]Wear, A., "Interfaces: Perceptions of Health and Illness in Early Modern England," in Porter R., & Wear, A., (eds) Problems and Methods in the History of Medicine (London: Croom Helm, 1987) 231.

the mines found a far cheaper way to lower the mortality rates: vaccination.

This chapter traces the numerous attempts made by the authorities to lower the death rate on the mines by using vaccines, and seeks to explain why the mass inoculation campaigns failed. It will also argue that the decrease in the death toll from both TB and pneumonia had more to do with external factors than with factors internal to the mining industry. Finally, a comparison will be made of the different methods used for combatting TB, silicosis and pneumonia by the mine authorities.

The nature of the migrant system was such that the workers' families rather than the mining houses tended to carry the bulk of the costs of the workers' ill health. This is vividly pointed out in Packard's book when he examines how TB was efficiently transported from the urban to the rural areas by returning miners.[3] Unfortunately lack of space and records rules out a full examination of these wider implications. Therefore the chapter will focus primarily on the situation on the mines, although passing reference will be made to the indirect health costs where possible.

During the Reconstruction period the Transvaal was administered by the British Colonial Office, whose medical policy has been explored by Michael Worboys.[4] The Liverpool and London schools of Tropical Medicine, both founded in 1899, had very different approaches to medical policy. While Liverpool under the directorship of Ronald Ross advocated a preventative approach, the London school under Patrick Manson favoured a more curative approach, notably through the use of vaccinations.[5] What is important in the South African context about this relationship was that the London school had

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[3]Packard, White Plague 92-125. See also, for example, the work of Dawson on the Kikuyu, "Health, Nutrition, and Population in Central Kenya" 201-217.

[4]Worboys, M., "Manson, Ross and Colonial Medical Policy: Tropical Medicine in London and Liverpool, 1899-1914," in Macleod, R., & Lewis, M., (eds) Disease, Medicine and Empire (London: Routledge, 1988) 21-37.

[5]The debate between preventing illness from occurring and curing the ill continues today. Health policy makers in South Africa, for example, are divided between a holistic approach that examines the patient's socio-economic status and an approach that simply focuses on the illness that affects the patient. For example, see de Beer C., The South African Disease: Apartheid, Health and Health Services (Johannesburg: Southern African Research Service, 1984).

considerable influence in the Colonial Office.[6] As a result the Colonial Office tended to search for "miracle cures" to diseases rather than prevent the infections from occurring. This is particularly evident where, albeit very crudely, segregation was based on sanitation concerns. Packard has noted how

> sanitary segregation, slum clearance, and medical screenings were instruments for keeping TB off the Rand and away from white urban populations, and had little or nothing to do with improving African health.[7]

Swanson's discussion of the "sanitation syndrome", discussed in the first chapter, mirrors the above view. The imposition of segregation was initially based on the belief that Africans were susceptible to diseases, especially TB, "because they were inexperienced in the ways of western industrial life," but that with time they would adjust.[8] Segregation was thus important as it would not only protect whites from being infected by Africans but it would also protect Africans from "the abuses inherent in a population travelling along the road from 'barbarism' to 'civilization'," thus ensuring that Africans were not infected by urban diseases to which they were apparently not immune.[9] The above was discussed, and agreed with, by the Mine Medical Officers' Association (MMOA) when a Dr P.A. Peall called on mine MOs to teach "elementary health principles amongst the Bantu" because he felt that this was something that "was sadly needed" as "so much of the trouble of the Native people in the way of ill health is ignorance". Furthermore, he stressed that "we would indeed be a very much fortunate and prosperous country if the whole of the Native population could be in the same healthy, happy conditions

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[6]For more details see Worboys 21-37.

[7]Packard, White Plague 194.

[8]Packard, White Plague 194. Packard argues that this "progressive view" shifts to a more "Stallardist" approach. In other words by the 1920s and 1930s the idea of gradually developing an urban African class was replaced with the view that an urban African class was no longer desirable. For more details see Packard, White Plague especially chapter seven (194-210).

[9]Packard, White Plague 195. There are numerous similar examples of this approach in other African countries. See, for example, Lyons, M., "Sleeping Sickness Epidemics and Public Health in the Belgian Congo," in Arnold, D., (ed) Imperial Medicine and Indigenous Societies (Manchester: Manchester University Press, 1988) 105-124. He discusses how the "cordon sanitaire" established by the Belgian government in the Congo to prevent whites from being infected "reflected the paternalistic nature of Belgian colonial policy in which health priorities formed a part of the justification for the methods of the social engineer. African societies, like the labouring classes in Europe, had, it was felt, to be controlled for their own protection" (105).

as the boys leaving the mines".[10] According to Packard it was this medical segregation along racial lines that in due course increased racial consciousness. Thus industrialization not only transformed South Africa's economy but "it also altered in a fundamental way the discourse on race in South Africa".[11]

Developing Packard's point that medical approaches were governed largely by racism, Vaughan notes that "colonial medicine was deeply concerned with" defining Africans as different "and their illnesses as being fundamentally affected by 'culture' ".[12] In other words, Africans became sick because of the process of deculturation. The "dressed native", for example, had made an "incomplete and inadequate adjustment to the conditions of urban life" and was therefore particularly susceptible to ill-health.[13] Elaborating on this she argues that colonial medicine is no different from other therapeutic systems in being culturally determined, as it was after all also part of a cultural system:

> as such it provided a language and a series of shifting images of the African colonial subject, it "mediated" the contradictions of colonial rule for the colonisers, and contributed to the tenacious racism of European culture in the twentieth century.[14]

The nature of colonial medicine and the racism that emerged in its policies can be clearly witnessed in the authorities' attempts to control pneumonia on the mines. In what follows it will be noticed how, though the medical treatments did change, the policy continued to derive from the perception that ultimately it was the miners' own fault that they acquired diseases.[15]

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[10]Peall, P.A., "The Inculcation of Positive Health Principles amongst Mine Native Labourers," PMMOA 18 (September 1938): 115-120.

[11]Packard, White Plague 195.

[12]Vaughan, M., "Directions in the Social History of Medicine in Africa," paper presented at the African History Seminar, University of London, London, 24 January 1990 4.

[13]Packard, White Plague 48-49.

[14]Vaughan 6.

[15]For an excellent discussion of the "victim blaming" see Packard, White Plague especially chapter 7 (194-210).

Pneumonia

Droplets containing organisms which cause pneumonia may be inhaled and thereby spread the disease from person to person. Once inhaled they may enter the lungs and then the blood stream. The most common type of pneumonia, pneumococcal pneumonia, is caused by an organism, a bacterium, known as Streptococcus pneumoniae (the pneumococcus). Although it was identified by Louis Pasteur in 1881, it was only in 1886 that Albert Fraenkel showed that the organism caused pneumonia. While pneumonia is normally associated with cold and winter it is also very common in tropical countries. The Oxford Textbook of Medicine notes that "despite the discovery of antibiotics which are highly effective against the pneumococcus in vitro, pneumococci still cause many deaths and much morbidity in both industrialized and in developing countries".[16]

Whilst it is customary to associate pneumonia with the aged or young children, incidence of pneumococcal pneumonia, in general an endemic disease, occurs more often in males of all ages. Incidence is especially high in closed communities, compounds on the Witwatersrand gold mines being a perfect example. A number of studies have shown that in such conditions as many as 50 per cent of healthy subjects surveyed were infected with pneumococci. In other words, it is possible to carry the bacteria without becoming ill. It is not at all clear why the pneumococci may or may not infect the host, although factors such as lowered body resistance, influenced by poor diet and harsh work conditions, could influence susceptibility.

Infections are more common in winter, which is a common time for upper respiratory tract infections which are closely related to the onset of the disease. Influenza epidemics are also usually periods of a much higher incidence of pneumococcus infection. Interestingly it appears that in tropical countries the hottest periods, associated with the lowest humidity, are the commonest periods for outbreaks of the disease. The onset of the disease is usually quite sudden, with fever often the first clinical sign. Chest pain usually appears during the course of the illness, with coughing a noticeable symptom. The first

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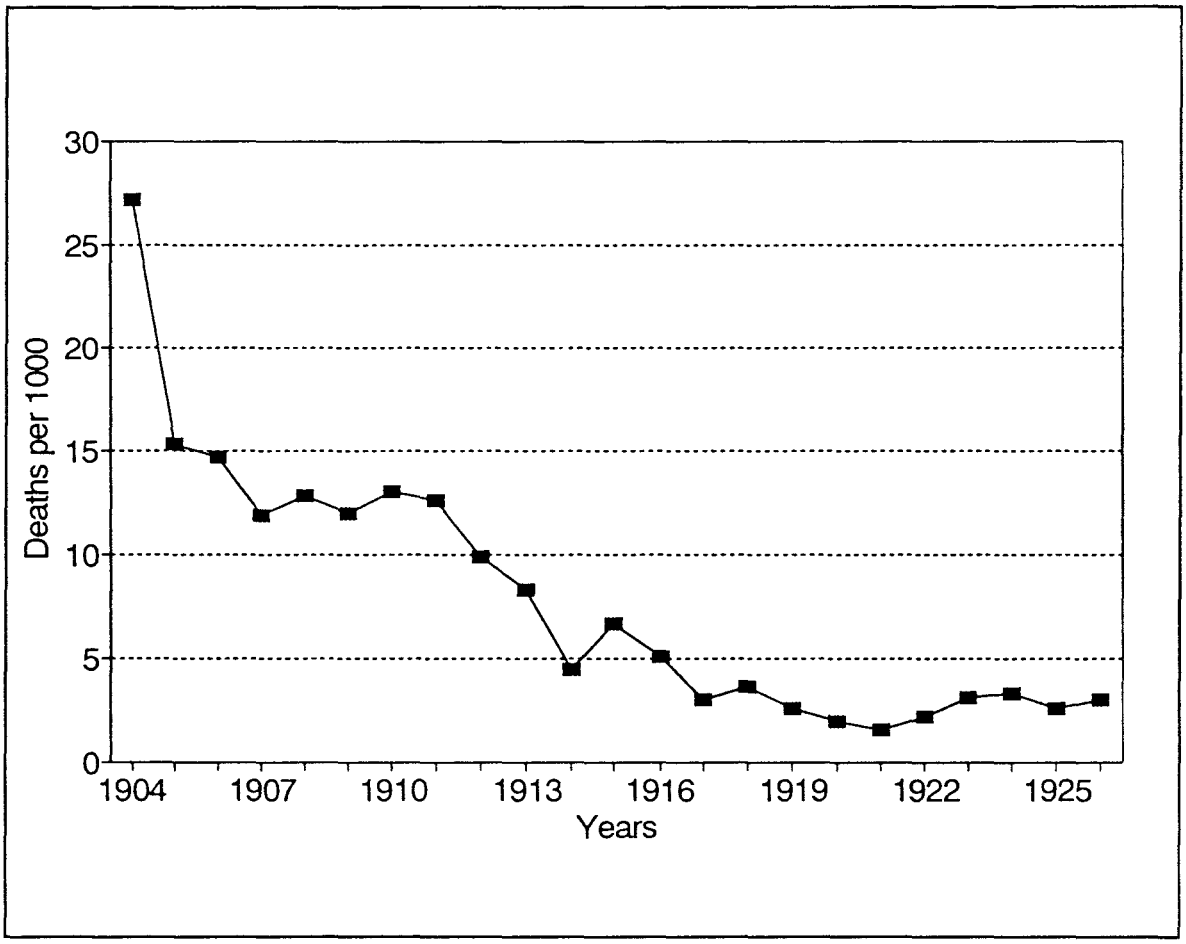
[16]Wetherall, D.J., Ledingham, J.G.G., & Warrell, D.A., (eds) Oxford Textbook of Medicine (Oxford: Oxford University Press, 1984) 5.149. In vitro (= "in glass") refers to laboratory experiments.

choice for the treatment of pneumococcal pneumonia is penicillin, which came into clinical use in 1944.

The high pneumonia mortality rate on the Witwatersrand gold mines (50.83 per cent of all deaths were due to pneumonia) in the first year after the South African War did not escape the attention of the Milner government. The authorities feared that a high mortality rate would prevent the British government from sanctioning the importation of indentured Chinese labourers.[17]



Graph 4: Pneumonia Mortality Rate, per 1 000, for African Gold Miners, 1904-1926. *Source: Chamber of Mines Annual Reports.*

Therefore, Lagden, as described in chapter 3, appointed a committee of medical specialists to examine the high mortality on the mines. The committee was largely made up of officials who continued to accept the pre-bacterial idea of infection; they believed that the greater the ventilation the smaller the

[17]Katz, Phd thesis 583-584.

chance of becoming ill. Thus the committee's discussion hinged around the ventilation of the compound rooms, although it was economics which had the final say.

A minority of the committee led by Dr (later Sir) George Turner advocated an air space of 300 cubic feet per person, a figure used in the regulations governing common lodging houses in Britain.[18] If the committee had accepted this suggestion it was estimated that it would have cost the mining industry thousands of pounds in building modifications. No mention was made of the human cost if Turner's recommendation was not implemented. The majority of the committee argued that 200 cubic feet was sufficient, thus saving the mining industry a considerable amount of money. Both Packard and Cartwright point out that the conclusion was based on incorrectly interpreting miners' behaviour in the compound rooms. The committee reported that miners were often found huddled together at night which suggested that they prefer a crowded room to space. The miners were, of course, huddling together because of the cold.[19] The committee recognised the need for improved living and working conditions and made a series of recommendations. These included the establishment of soup kitchens at the shafthead, extra blankets in cold weather, impervious floors and more air space per person. The committee concluded that "natives are particularly susceptible to this disease, and the conditions of mining work favour its incidence".[20] None of these reforms were uniformly implemented.

As expected the situation only deteriorated. One horrific example of this began on 26 February 1904 with the arrival of 164 Tropicals at a particular mine. The original batch was soon joined by another 42 tropicals. By June of the same year 116 (56 per cent) of the men were dead. No action was taken

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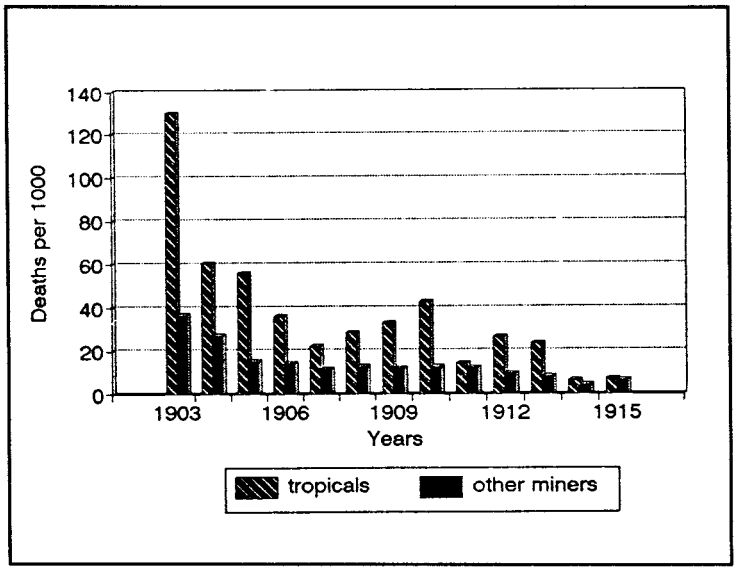
[18]Donald Denoon notes that Turner, later Sir George Turner and father of Dr G.A. Turner, was involved in British Public Health before going to the Cape in 1895. After the South African War he was "poached" by Milner. He was relatively unpopular as he tended to side with the African workers and "he was also unhelpful in framing medical arguments to justify municipal segregation". Turner, after leaving public service, went on to study Leprosy. The disease killed him in 1915 ("Temperate Medicine and Settler Capitalism: On the Reception of Western Medical Ideas," in Macleod et al. 121-138.). See also Dictionary of South African Biography (Pretoria: HSRC, 1981) 4: 665-667.

[19]Cartwright, Doctors on the Mines 19-21. Packard, White Plague 76-78. See also Katz, Phd thesis 595-597.

[20]Cartwright, Doctors on the Mines 17.

against that particular mine. A further problem for the authorities was that there was a significant difference between the mines' mortality rates; for example, in 1904 the Wemmer mine had a mortality rate of 31.1 per 1 000 miners, whereas the Witwatersrand Deep mine had a rate of 135.2 per 1 000 miners.[21] In the year ending 30 June 1905 the Tropical death rate was 130.1 per 1 000 for all mines on the Witwatersrand. The majority of these deaths was attributed to pneumonia. The table below illustrates how the Tropicals were being annihilated.[22]



Graph 5: Pneumonia Mortality Rate, per 1 000, for Tropicals and Other Miners, 1903-1915 [23]

The Tropicals' high mortality rate became a political "hot potato" for the gold mines. By 1911 over 24 000 Tropicals were employed, and they consequently formed an important component of the labour force. Furthermore, as mentioned earlier, Tropicals were sought after because of their ability to withstand the high temperatures underground and the fact that generally their contracts were longer than those of the other miners. However, it would appear that their ability to cope with high temperatures meant they were far more susceptible to low temperatures experienced by miners at night in the compound. The government's attention was drawn to the above-average death rate by the British government, which received complaints from British Nyasaland about the appalling death rate, and by the NAD, whose statistics recorded the carnage. In

[21]Moroney, "Worker Control" 2.

[22]See also references in earlier chapters to the debate around the banning of recruiting tropicals.

[23]Figures compiled from Baker 96 and Dr E.H. Cluver's 1927 report to the Secretary for Public Health (COMA).

August of 1911 the Minister of Native Affairs met with the mining industry to record his disquiet over the high death rate. He did nevertheless stress that he felt the mining industry could do little, apart from ban recruiting:

> My feeling about the thing today is that the climatic change is so great, and these people have got feeble constitutions; they are full of material germs and all sorts of diseases; you can do what you like for them, you can make the conditions as healthful as you like, but I fear you cannot really make much difference.[24]

When the then Minister of Native Affairs met with the Chamber of Mines and representatives of WNLA to discuss the high death rate of Tropicals on the mines he recounted how on an inspection of a mine hospital he had asked the doctors present whether anything could be done about the high death rate. They simply shrugged their shoulders and "were candid enough to say they did not think so...They thought everything in reason had been done already".[25] The minister lamented further that the Chamber had failed to furnish him "with any medical opinion regarding the possibility, by means of the various improvements that are suggested, of really making a specific reduction. I have got from your Chamber nothing, nothing from anybody. I have no medical opinion brought to me to show that there is really the faintest hope by the improvements suggested of reducing the mortality".[26] Despite some protracted lobbying, the Mines were unable to prevent the recruiting ban from being imposed, and the ban was introduced in 1913. A number of attempts were made by the mining industry to overturn the ban, most noticeably through the 1919 Low Grade Ore Commission and the 1922 Mining Industry Board: however, the ban remained in place until 1933.

At the same time that the SAIMR was being established the mines had invited Colonel Gorgas to suggest how the industry could solve the problem of pneumonia.[27] In 1914 he found that the mortality figures for pulmonary diseases should have been higher. His argument was that "a considerable number of

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[24]COMA, "Proceedings of a Meeting between the Minister of Native Affairs, Chamber of Mines, and WNLA," 17 August 1911.

[25]COMA, "Minister of Native Affairs".

[26]COMA, "Minister of Native Affairs".

[27]It has already been mentioned in chapter three that Gorgas made several suggestion on environmental reforms, few of which were acted on.

(autopsies) cases, reported as pneumonia, are really tuberculosis". Gorgas concluded that these were due to "an unavoidable clinical error...I am of opinion that a considerable number of cases of deaths, reported as pneumonia are really tuberculosis". Gorgas came to this conclusion after his assistant had witnessed a number of autopsies in the WNLA compound. Gorgas also added half the number of miners repatriated to the death total, arguing that "it is not a high estimate to say that half of these died during this year". In that particular case, adding half the repatriations doubled the total of deaths for 1912.[28]

In examining pneumonia mortality figures Gorgas was struck by the high incidence of pneumonia amongst new recruits. 59 per cent of all pneumonia deaths occurred in the first six months of contract. Pneumonia mortality rates also varied within Johannesburg. The official figure for Africans living in Johannesburg was 1.20 per 1 000, but the New Goch mine had a rate of 16.71 per 1000 miners employed. Gorgas explained this by noting that "individuals and races differ widely in the degree in which this organism affects them" and that Africans had less resistance than whites did; thus the key was "seasoning".[29] The more seasoned the recruit was the smaller the chance of being infected with pneumonia. During the building of the Panama Canal, Gorgas noted that the death rate for new recruits was 4.5 times higher than for workers who had been there for some time, which led him to suggest that susceptibility was dependent on the length of time spent on the mines. Gorgas had managed to decrease the pneumonia mortality rate on the Panama canal by establishing a permanent labour force, and by allowing the labourers to live in huts with their families as opposed to their living in barracks. His recommendation to the mines to do likewise with African miners was firmly rejected by the Chamber. Prophetically, Gorgas stated that in the future "present conditions continuing, tuberculosis will cause you more trouble among natives than does pneumonia at present".[30]

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[28]Gorgas 343. Twenty years later the 1932 TB Commission found that over 50% of the miners repatriated in the late 1920s to the Transkei and Ciskei were dead within 3 years after repatriation (Metcalf, C. "A History of Tuberculosis," in Coovadia, H.M., & Benatar, S.R., (eds) A Century of Tuberculosis: South African Perspectives. [Cape Town: Oxford University Press, 1991] 22).

[29]Gorgas 336.

[30]Gorgas 344.

Tuberculosis

Pneumonia was therefore firmly in the limelight, a position, rightly or wrongly, it was to maintain for the next three decades. But it was TB that was going to cause the most damage. Like pneumonia TB infection usually, but not always, occurs through the inhalation of airborne droplets containing the tubercle bacilli, emitted by a person with active TB. Furthermore, like pneumonia, infection does not necessarily lead to the active development of the disease. The classic social disease, TB is usually associated with poverty and malnutrition and is thus "linked to changing social and economic conditions within society".[31] Known as the "great white plague" the disease was the "number one cause of death in Europe and America" during the industrial revolution. It declined in those industrialized societies largely as a result of improved socio-economic conditions and the population developing immunity to the disease. It was only in the 1950s that medical science developed an antidote for it. Nevertheless, preventative methods of TB control had begun in England by the latter half of the nineteenth century.[32]

However, in South Africa surprisingly little was done about TB by the State in the period after the great influx of TB patients - European immigrants - after 1880. The first TB Commission was only set up in 1912. It was unable to do much due to the difficulties it encountered in collecting data, although it was able to stress the need for improved housing conditions and recommend that an education campaign on the disease be run.[33] Neither occurred. In 1919, under the Public Health Act, TB became a notifiable disease.

The problem with TB, as opposed to pneumonia, is that while the latter is a relatively quick disease (a person either recovers or dies soon after being infected), the former is not. This means that if a person is infected, the illness can drag on for a long time during which many other people can become infected.

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[31]For more details on the etiology of TB see Packard, White Plague xviii-xx.

[32]For more details see Packard, White Plague 1-10.

[33]Tuberculosis Commission: First Report Dealing with the Question of the Admission of Tuberculosis Immigrants into the Union, UG42-1912. See also Report of the Tuberculosis Commission, UG34-1914.

Furthermore the mines throughout the period under discussion repatriated miners with TB. The large numbers of African mineworkers living in appalling conditions therefore ensured that the mining industry "would play a central role in the early development of TB in Southern Africa".[34] The whole mine experience contributed to the spread of TB at every stage and on every level, whether in recruitment, housing and feeding, or work conditions.

Statistics are difficult to come by but the mines' official figures for TB repatriation (known cases) was 7 500 between 1910-1912, all of whom effectively spread TB, albeit unevenly, through the rural areas. Factors influencing this process included the length of time the community was involved in the migrant system and hence exposed to TB; secondly, the intensity of exposure to people - the more remote the area the smaller the chance; and thirdly, African treatment of the disease which varied from area to area - some communities excluded TB sufferers, and placed them in quarantine. Packard, however, cautions that "further research on African reactions to diseases introduced by European contact is clearly needed before we can determine how much weight should be placed on this factor".[35] Finally the infection rate was dependent on the communities' ability to resist infection, as well as the general health of the community. At this time rural communities were already under siege as diminished landholdings and reduced soil worth meant that it was becoming impossible to live from agriculture alone, a factor that naturally impinged on the communities' health.

In 1913 Dr G.A. Turner produced his "Report on TB Amongst Natives". Commissioned by the Chamber of Mines it painted a horrific picture of the incidence of TB on the mines. The paper began with a historical examination of the prevalence of TB before the South African mineral discoveries, in which Turner argued that it was difficult to ascertain the situation as medical records were very sparse, and African rural societies in any case tended to consult their own healers. However, Turner felt there was sufficient evidence to claim that TB existed to "a marked degree among the coloured population in

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[34]Packard, White Plague 67.

[35]Packard, White Plague 104.

the Cape Colony and the native territories, for at least half a century".[36] The report also acknowledged that there were misdiagnoses between TB and phthisis. Yet it failed to acknowledge that recorded mortality figures presented only part of the picture, as Turner did not include the miners who had died, of pulmonary diseases, once they had been repatriated. Turner did 601 post mortems, of whom about 70 per cent were "East-Coasters".[37] After a mine MO had decided to repatriate a miner, he was sent to the WNLA compound for a final examination, to confirm whether the illness warranted repatriation and whether or not the miner was liable for any compensation. In a number of cases the miners were so ill that they died in the WNLA compound before they could be repatriated. The following table documents these post mortems done on some of the miners in 1913.

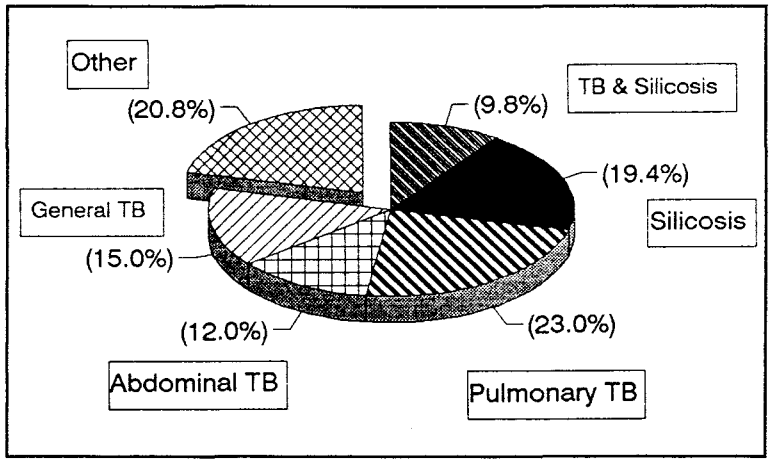

Table 4: Dr Turner's Post Mortems, 1913

From the table it is clear that about 60 per cent of the miners who had died in the WNLA compound had died of TB.[38] But fifteen years later the incidence of TB had increased. In a twelve-month period, 1927-1928, 284 post mortems were performed in the WNLA compound; 222 showed varying degrees of TB. In only 15 of the 222 cases could the doctors say with some confidence that TB had not been the

[36]Turner drew some of his evidence from the 1874 records of a dispensary in the Transkei. The dispensary had noted a high number of bronchial complaints (80 per 1 000 patients) which were possibly related to TB. Turner argued that the prevalence was no doubt due to "midnight dances" and "damp air" (COMA, Dr G.A. Turner, "Report on Tuberculosis Amongst Natives," 1913).

[37]Interestingly 70 per cent of them were East Coast recruits, who were said to be the most common group diagnosed as having TB - due, no doubt, to their having the longest contract periods, usually about seventeen months (Turner, "Report on tuberculosis").

[38]Turner, "Report on Tuberculosis".

cause of death. Of the remaining 207 TB-related deaths, 86 had also had silicosis.[39]

A further argument instrumental in the development of medical policy was that indigenous Africans had never been exposed to TB before the whites arrived. This "virgin soil" theory, when applied, undoubtedly influenced segregationist ideas, for if Africans had never been exposed to TB, policy should be directed at ensuring that their exposure was limited. Unfortunately for the miners this did not mean better living and work conditions; it meant a migrant system. For urban dwellers it meant locations on the urban periphery. In any case, Packard has questioned the idea that South Africa was a "virgin soil" for TB, arguing that TB is one of the oldest microparasites known to humanity and that skeletons from the Old Kingdom period in Egypt have been found to have been infected with TB. Admitting that evidence for TB amongst indigenous groups is scanty he points out that there is very little evidence to support the medical authorities' counter-claims. The theory is based on the very limited exposure that white doctors had to African patients in the 19th century.[40]

Vaccination

Cartwright refers to the "last half of the nineteenth century and the first decade of the twentieth" as the "golden era of vaccination".[41] It was a period in which many health problems were solved using vaccinations. This success heavily influenced the medical policy of the mines, which naturally turned to vaccinations as a means to eradicate pneumonia. As early as 1903 the Chamber began searching for a vaccine. In that year it gave a research grant of £1 000 to Dr Pakes, the Transvaal government's bacteriologist, to find an anti-pneumonia serum. The Chamber never acquired anything for the money,

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[39]"Transvaal Mine Medical Officers' Association," The Journal of the Medical Association of South Africa 2 (22 September, 1928): 497-500.

[40]Karen Jochelson has also noted that there must have been a large disease pool already present in South Africa prior to colonisation. In her work on syphilis she notes that "while venereal syphilis probably was introduced by white settlers and transmitted from urban to rural areas by migrant workers, a pool of endemic non-venereal syphilis probably already existed in parts of South Africa and its manifestations were often mistaken for venereal syphilis." (quoted from "Tracking down the Treponema: Patterns of Syphilis in South Africa, 1890-1940," paper presented at the History Workshop, University of the Witwatersrand, Johannesburg, 1990).

[41]Cartwright, Doctors on the Mines 25.

as Pakes was forced to resign amid accusations of misusing the research grant.[42]

In 1911 the Chamber engaged the services of Britain's leading bacteriologist, Sir Almroth Wright. Sir Almroth, who had discovered an anti-typhoid vaccine, came out to South Africa to begin experiments to find an equally successful vaccine for pneumonia.[43] Unfortunately for all concerned the whole trip appears to have been a disaster. With two assistants Sir Almroth began vaccinating newly recruited tropicals in the WNLA compound as well as some other miners in several compounds. In the first of a series of mass vaccinations Wright and his team vaccinated more than 47 000 miners.[44] The results were unsatisfactory as a consequence of inadequate records being kept as to who had been vaccinated and who had not. Furthermore it was unclear as to how many times miners had been vaccinated, as miners were thought too untrustworthy to be asked whether they had been vaccinated or not.

Without reasonable grounds Wright nevertheless argued that the vaccinations had reduced the incidence of pneumonia and that "as a routine measure" all miners should be vaccinated. Yet even Maynard, the SAIMR statistician, felt that Wright was being over-optimistic. Writing in 1915 Maynard argued that because the application of the vaccine had not been uniform one could not rely on the results produced. But rather than blame the vaccine, Wright argued that the results proved that Africans were racially susceptible to the disease. Once again the victim was blamed.[45]

Today medical science knows that it would have been well-nigh impossible to create a uniformly effective vaccine, as at least 83 different types of pneumococci exist. Therefore, because of geographical variations, vaccines are only effective if they contain the antigens which correspond to the

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[42]Baker 97.

[43]For an interesting account of the world-wide search for an anti-serum for pneumonia, see Parish, H.J., A History of Immunisation (London: E. & S. Livingstone Ltd., 1965) 252-258.

[44]Malan puts the figure closer to 50 000 (96). For more details on Sir Almroth's trip see Baker (89) and Cartwright (Doctors on the Mines 26).

[45]Baker 98. See also Cartwright, Doctors on the Mines 26. Interestingly, Gorgas was sceptical of Sir Almroth Wright's use of the anti-pneumonia vaccine and argued that the evidence "is more or less contradictory...the inoculated do not show any greater protection than the controls" (Gorgas 341).

pneumococci responsible for the majority of pneumonia cases in a given area. Vaccinations today are used only in specific cases.[46] It was therefore not surprising that the results proved to be inconclusive. A further factor that confused the issue was that people suffering from Sickle Cell anaemia, a relatively common characteristic amongst people in high malaria zones (Tropicals), are severely at risk from pneumococcal pneumonia.[47]

On 23 April 1913 the SAIMR was opened under the directorship of Dr Watkins-Pitchford. Sponsored jointly by WNLA and the Union government, its primary task was, through research, to prevent diseases and develop treatments for diseases that were "not preventable". The WNLA contribution, £9 000, came from the £48 000 it had made, since its inception, from the sale of clothing and blankets to new recruits. The Institute was initially concerned primarily with industrial diseases. Pneumonia was seen as the most important of these, although this focus has changed since then. Its birth was particularly induced by the debate on Tropicals that occurred during this period. The Chamber had been spurred into action by the high mortality rate amongst Tropicals, which had reached the government's attention. The State was placing considerable pressure on the mining industry to do something about it.

Simultaneously, although quite independently, Dr (later Sir Spencer) Lister was developing a pneumococcal vaccine on the Premier Diamond Mine.[48] Although there were few Tropicals on the mine, and it was thus unclear whether the vaccine would work for them, and despite the fact that the Premier mine and its closed compound appeared to be better at isolating miners from infection than many of the gold mine compounds, Lister was convinced that such a vaccine could work - a belief he

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[46]An anti-pneumonia vaccination, for example, would be given to patients who had had their spleen removed.

[47]Wetherall et al. 5.149. The presence of Sickle Cell anaemia allows the body to resist being infected with Malaria.

[48]Before his appointment to the SAIMR Lister had worked on the Premier Diamond mine, the Bandjes Consolidated Mines and Durban Roodepoort Deep. While working as a MO on these different mines he had experimented on the labour force using a number of different vaccines. Lister was knighted in 1920 for his work on the antipneumonia vaccine. For Lister's account of this experiment see his "Prophylactic Inoculation of Man Against Pneumococcal Infections and More Particularly Against Lobar Pneumonia," Publications of the SAIMR, 10 (November 1917).

dogmatically stuck to for the next three decades, despite much opposition from many mine MOs. The following section discusses the SAIMR's first task, which was to discover an anti-pneumonia vaccine.

Mass Vaccination Campaigns

Drs Lister and Maynard continued the search for a vaccine after Wright's departure. Beginning in 1914, over a ten month period, a further 55 900 miners, on selected mines, were vaccinated. The method of vaccinating half the workforce and keeping the other half as controls was used. Lister considered that his faith in the vaccine was vindicated, as he found a 20 per cent decrease in the incidence rate amongst those who had been vaccinated compared with those who had not. Maynard disagreed, pointing out that the vaccine had had no effect on the mortality rates and that the question of immunity remained unanswered since the Tropicals, recruited prior to the ban, were not identified in the experiment. Furthermore, according to Maynard, the vaccine did not offer any long-term solution as the vaccine lasted no more then five months; in a relatively short period after vaccination, miners were becoming infected with pneumonia. The vaccination seemed to make no difference in the long term.

Lister continued undeterred. Between November 1916 and October 1917, on the Premier diamond mine and two gold mines (Crown Mines and De Beers), Lister vaccinated 200 000 miners with another antipneumonia vaccine. Again the issue of technique played a significant role in the experiment. The SAIMR, which prepared all Lister's vaccines, discovered at the end of the experiment that it had issued 300 000 doses of the pneumococcal vaccine. Many miners had therefore been vaccinated more than once.[49] While the pneumonia incidence rate did decrease it was difficult to know what the reason for the decrease was. Was it because compound conditions were improving, was resistance increasing or had the vaccine played a significant role? No one knew the answer. The results of this experiment sparked a debate between Lister and Orenstein which was only terminated by the death of Lister in 1939.

Discussing the vaccination process undertaken in 1917 on the Corner House Group's mines, Orenstein

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[49]Doctors, today, point out that inoculating someone more than once with the pneumococcal vaccine may cause anaphylaxis (collapse of the cardiovascular system on an allergic basis).

had pointed out to Lister that, in the mines belonging to the Corner House Group, five mines had vaccinated miners. These mines had recorded a pneumonia mortality rate of 3.3 per 1 000. The 8 other mines, which had not used the vaccine, had recorded a mortality rate from pneumonia of 2.2 per 1 000.[50] While, as noted above, pneumonia infection is very complex and the state of workers' immunity, environment and working conditions all play a role, one would still expect a lower mortality rate and not a higher one if the vaccine was effective and the experiments controlled.[51]

A further reason for the debate's longevity was that the types of pneumococci that Lister had identified for his vaccine apparently disappeared and were replaced by different ones, thus making it even more unlikely that his vaccine would work. The point mentioned previously - that because of the numerous types of pneumococci present, a vaccine was unlikely to be useful - remained as valid in the 1920s as it did in the previous periods.

The debate also tended to hinge on the methods used in the experiments, which obscured any discussion of the usefulness of the vaccines. One doctor compared the methodology used to that of a "blunderbuss with mixed shot and slugs".[52] Lister should have vaccinated fewer miners, since for control purposes it is wise to keep samples relatively small. The reason for this, in the case of vaccinations, is that the more people who are successfully vaccinated, the less chance there is of the unvaccinated contracting the disease. It thus becomes increasingly difficult to distinguish between the control group and the sample group as the total population of inoculées grows.

A further mass vaccination programme was undertaken in the six month period beginning at the end of 1918. The programme was marred by its erratic implementation, thus affecting once again the statistical relevance of the campaign. The mines in the Krugersdorp district, for example West Rand Consolidated

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[50]Malan 96-101.

[51]If the miners were being inoculated more than once this may well have led to more deaths rather than fewer.

[52]Dr F.J. Allen quoted in "Transvaal Mine Medical Officers' Association," (1935) 239.

and the Luipaards Vlei Estate mine, vaccinated all new arrivals from about September 1918. On the other hand, in the compounds belonging to the Randfontein Central G.M. Company only some of the miners were vaccinated as certain compounds refused to submit to the vaccination, a reluctance that was spreading amongst the miners.

This practice of refusing to be vaccinated occurred in many compounds. In some instances the miners refused to be vaccinated at all, while in others the miners refused to have the second and third injection. The advocates of vaccination suggested that the injection be given three times, at one week intervals. This process affected labour recruitment, especially the attraction of voluntary labour which traditionally did not have to undergo any pre-employment medical examination. Some mines therefore refused to vaccinate, which encouraged miners on other mines to refuse as well. The medical inspector for Roodepoort noted that on the Princess Estate gold mine

> a large majority of natives refuse the first inoculation... Owing to the shortage of labour we are not insisting upon inoculation, until the position improves somewhat. The compound officials on this property consider that the reluctance of natives to submit themselves to inoculation shows no tendency to decrease, rather the reverse. As will be seen, the mines in this district are not unanimous in the inoculation of natives and unless the inoculation is made compulsory, I cannot see how any improvement can be expected in the reluctancy of natives to submit themselves to inoculation.[53]

Miners were refusing to be vaccinated because the injection invariably made them feel ill, and consequently made them miss at least one shift. The Chopi, for example, sang a song whose lyrics, translated, went as follows"

> Five had better take more notice of our playing than he does, otherwise we shall take him to the hospital and get the white man to inoculate him and make him feel very sick.[54]

In extreme cases the miner died. To confuse matters more, on some mines the vaccinated had a lower

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[53]TAB, GNLB, 56 1478/12/103, letter from Mr Cook, Inspector of Mines, Roodepoort to the Director, NAD, 15 February 1919.

[54]Five was the name of a "recalcitrant policeboy". The lyrics are taken from a songsheet in the possession of Andrew Tracey.

pneumonia mortality rate than the unvaccinated, while on other mines the exact opposite was achieved.[55]

A major problem was that the 1918-1919 mass vaccination programme occurred at the same time that the Spanish influenza epidemic was sweeping the country. This made it impossible for the authorities to establish whether miners were dying from influenza or pneumonia. Miners on the other hand did make the distinction. They believed that it was the vaccine that was killing them, not the influenza. About one-third of the labour force was infected in the first month of the epidemic. Recruiting from Mozambique was suspended and 1 147 miners died in all.[56] Obviously the compound conditions were well suited to spreading a disease as infectious as Spanish influenza.[57]

As mentioned earlier, the miners were not the only ones sceptical about the value of the anti-pneumonia vaccination; so were many of the MOs. The creation of the Mine Medical Officers' Association (MMOA) in 1921 focused the efforts of the Mine MOs especially on the area of pneumonia. Throughout the ensuing two decades the MMOA regularly discussed attempts to reduce pneumonia incidence. There was, however, a lot of discussion but little action. By the early 1920s the MOs were well aware that environmental reforms would reduce incidence and that miners were at their most susceptible in the first few months of arrival at the compound.

In 1924 the MMOA had a series of discussions on the efficacy of Lister's vaccine. Many of the MOs

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[55]TAB, GNLB, 56 1478/12/103, for correspondence between the mine inspectors and the director of the NAD.

[56]Phillips 2. According to Phillips about a third of the African workforce were admitted to mine hospitals during the epidemic (see 2-7 for details).

[57]Ranger in his study of the influenza pandemic in Southern Rhodesia has noted how the inability of the whites to prevent the disease from spreading led to many Africans turning their backs on western medical techniques and embracing indigenous techniques and explanations. But these proved to be equally unsuccessful and so "the influenza crisis partly gave rise to, and more largely legitimated, new movements of explanations, which prohibited the use of both western and traditional medicines". These "new movements", according to Ranger, were the African spiritual churches (Ranger, T., "The Influenza Pandemic in Southern Rhodesia: A Crisis of Comprehension,' in Arnold, D., (ed) Tropical Medicine and Indigenous Societies. [Manchester: Manchester University Press, 1988] 172-188).

present were very doubtful about the prophylactic, arguing that in all cases the results were inconclusive. The following year the MMOA sent a questionnaire on pneumonia to all the gold mines. A clear majority of the replies called for the vaccine programme to be stopped. One MO, Dr Goudie, argued that the vaccine was doing more harm than good as it lowered the miners' resistance to pneumonia "for some time immediately following the vaccination". He concluded by stating bluntly that the vaccination programme accounted for the high death rate on the mines.[58] There may well have been more than a grain of truth in what Dr Goudie said. On the one hand there were the mine MOs whose statistics told them that the vaccine was not working, while on the other hand there were the government officials and the SAIMR arguing that the vaccine, if administered properly, would prove to be effective. At the heart of the problem was money. Vaccinating one's labour force was far cheaper than paying for expensive environmental improvements. This was clearly seen at the March 1931 meeting of the MMOA. Dr David Ordman from the SAIMR argued, having noted that different regions were exposed to different types of the pneumococcus, that a "community autogenous vaccine" should be administered on all the mines. In other words, a vaccine should be developed from the victims' sera. The MOs refused to go along with this. They argued that the vaccine was useless. Sir Spencer Lister, who was also at the meeting, countered that to obtain reliable results data should be compiled "under discipline...and nothing but strict and accurate methods of investigation employed", thus implying that the mine MOs were not compiling accurate records, an implication to which they naturally did not take kindly.[59]

The SAIMR was not the only body of medical opinion that felt the vaccinations were not being administered properly. The government's health department was of the same opinion. Dr Cluver cited the following as evidence for this opinion. The SAIMR had in 1926 issued 451 900 cc. of vaccine for 183 219 miners (2.5 cc. per miner). The following year it had issued 384 250 cc. of vaccine for 185 007 miners (2 cc. per miner). In other words, there was some discrepancy in the amounts each miner was injected with. Secondly, Cluver noted that the type of pneumonia had undergone some form of change, which the vaccine was not able to combat. Lister's vaccine was aimed at combatting A, B, and

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[58]Cartwright, Doctors on the Mines 109-124.

[59]Cartwright, Doctors on the Mines 113-115.

C strains of pneumococcus, which Cluver refers to as "primary pneumonia", but according to postmortems this type of pneumonia was hardly ever found in the 1920s. Apparently a new "aberrant unclassified type" was now being encountered, which Cluver referred to as "secondary pneumonia".[60] It is necessary, therefore, to question Cluver's logic because if the vaccination was of no use it would not have mattered if it had been applied correctly or not. The only issue would then have been that the miners were being placed at considerable risk by being injected with a type of pneumonia not present on the mines.

Cluver was also of the opinion that environmental reforms were unlikely to improve the pneumonia incidence as the disease appeared to follow a cyclical pattern. The incidence rate of the disease increased and decreased regardless of any preventative methods. But contradicting himself, Cluver had referred to "sanitary slackness" as the reason for the wave of pneumonia that swept the mines in the late 1920s. He also argued that because meals continued to be overcooked the food lost its vitamin content, which in turn helped lower the body's resistance to disease, thus contributing to the increasing incidence of pneumonia.[61]

Central to Cluver's report was the idea that the patient was influential in bringing the disease on himself. This philosophy can clearly be seen elsewhere. In August 1927 The Gold Producers' Committee (GPC) established a sub-committee to address the pneumonia problem. The sub-committee surveyed thirty gold mines and five collieries and concluded that

> the physique of the native recruits plays a considerable role in both attack and mortality rate from pneumonia and that the physique of the recruits is therefore of importance; that there is probably a periodicity in the incidence of pneumonia; and that the Witwatersrand mines are now going through a period of rise in the curve of incidence.[62]

Once again the committee was blaming the victim for becoming infected. The committee rejected the

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[60]COMA, Dr E.H. Cluver's report on "Pneumonia Mortality Rates," to the Secretary for Public Health, 29 November 1927.

[61]Cluver, "Pneumonia".

[62]"Transvaal Mine Medical Officers' Association," Journal of the Medical Association of South Africa 2 (1928): 309-311.

idea that "the deeper mine or the larger ratio of recruits" had anything to do with the increase in incidence.[63]

Packard has pointed out that the medical evidence did not substantiate the blaming of victims. Miners became infected for a number of reasons. The greater the depth at which the miners had to work, the greater was the chance of becoming infected. Furthermore the high temperatures, which made the work more difficult and hence made miners more susceptible to pneumonia, and the narrower stopes, which forced workers to be in close proximity to one another and increased the chance of inhaling the pneumococci, were characteristics of deeper workings. The other feature of deep level mining was that workers remained underground for longer in this environment. On the question of miners' "physique", one could point to the collapse of productivity in the rural areas. As the reserves declined the nutritional value of the rural diet decreased. Many miners who arrived on the mines from the late 1920s onwards exhibited varying degrees of malnourishment.[64]

In the same year that the GPC was denying that the increasing number of recruits had anything to do with increased pneumonia incidence, the Secretary for Health showed that Basutoland recruits had a significantly higher pneumonia mortality rate than did miners recruited from South Africa, as the following table clearly shows.

YEAR	BASUTO DEATHS	UNION DEATHS
1926	3.92/1000	1.59/1000
1927	4.32/1000	1.94/1000

Table 5: Pneumonia mortality rates for recruits from Basutoland and South Africa, 1926 & 1927.[65]

[63]"Transvaal Mine Medical Officers' Association," 309-311.

[64]Packard, White Plague especially 68-69 & 113-125.

[65]SAB, GES, 904 589/13, 5 November 1928, Dr E.H. Cluver's report, "Basutu Mortality Rates on Transvaal Mines," to the Secretary for Public Health.

Cluver suggested that the reasons for this difference were that the recruits from Basutoland lacked acclimatization and immunization, and also that the "Basuto lives a considerably more dissipated life than other natives. He goes out more in search of pleasure which generally takes the form of alcohol consumption and promiscuous immorality". This last statement was based on the fact that the Basutu had the highest incidence of syphilis on the mines. Their unhygienic habits were also said to be a factor.[66] It was an example, yet again, of officials blaming the victim for being infected rather than blaming their own health policy or the living and working conditions on the mines. The high mortality rate amongst Basutu is more certainly ascribed to their being recruited, as opposed to voluntary, labourers, since recruited labour was more likely to be sent to the "harsher" mines, mines that were involved in deep level mining. Deep level mining was traditionally seen as far more arduous than outcrop mining, for instance. Harsh work conditions, as mentioned earlier, increased the likelihood of becoming infected with pneumonia.[67]

At the MMOA meeting of June 1934, Orenstein presented his reasons for rejecting the use of the vaccine as follows:

> 1. The true etiological factors of the respiratory diseases pneumonia, broncho-pneumonia and influenza were not yet clearly demonstrated. 2. Attacks of these diseases, natural in man but artificially induced in animals, produced no marked immunity, except in certain experimental animals after inoculation with living cultures of pneumococci. 3.Inoculations of these animals with dead pneumococci had produced only questionable immunity. 4.Inoculation with dead cultures against diseases, an attack of which does not induce immunity, does not appear to generate either marked or lasting immunity. 5.Immunization by a mixture of varieties of organisms appeared to him to indicate lack of exact knowledge.[68]

Many of the mine MOs present endorsed what Orenstein had said but resolved to do one final vaccine experiment with strict controls to decide the fate of the prophylactic. The proposal was never taken up.

Instead the SAIMR decided to test the idea of the "community autogenous vaccine". The two mines

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[66]Cluver, "Basutu Mortality".

[67]Packard, White Plague, 88-91.

[68]Cartwright, Doctors on the Mines 119.

chosen, both from the Corner House group, were City Deep (deep level mine) and Geldenhuis (medium level mine). City Deep had a population that ranged from 8 000 to 9 400, whereas Geldenhuis had a population that ranged from 4 000 to 6 600. Since 1924, when vaccinations began on the two mines, they had had an increasingly higher pneumonia incidence rate than the rest of the Corner House group. Between 1930 and 1934, when no vaccinations were given on either of the two mines, the incidence of pneumonia had decreased. The experiment ran simultaneously on both, from 10 October 1934 to 31 September 1937. The statistical analysis of the experiment was performed by Professor Dalton who concluded that "it was not possible to attribute the results obtained to the introduction of inoculation. The manifestation showed a secular trend due to a yet unknown cause".[69] In other words the vaccination had made no difference. This appears to have been the last of the mass vaccination experiments.

While the whole process may justifiably be criticised, especially for using human beings in such numbers with scant regard for medical ethics, we should not lose sight of one important issue. Had Lister's work been taken up and continued, though without the mass vaccinations, the world could perhaps have been a lot closer to finding better anti-pneumonia vaccines then it is today. But Lister's work was only sporadically continued. A major reason for this was the discovery, in 1938, by the British pharmaceutical company May and Baker Limited of Sulphapyridine (M & B 693). The drug was tested on African gold miners infected with pneumococci. The results were fairly encouraging and it appeared that the MOs now had a drug to combat pneumococcal infections.[70] The drug was overshadowed, in 1944, by the discovery of Penicillin.

Return of the Tropicals

The high death tolls registered in the reconstruction period after the South African War became something of the past; so much so, that the mining industry was able, in 1932, to convince the South

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[69]Cartwright, Doctors on the Mines 121-122.

[70]Cartwright, Doctors on the Mines 67.

African government to rethink the ban on Tropicals.[71] Tropicals were vital to the industry for two important reasons. Firstly, because the 1928 Mozambique Convention had limited the number of "East Coasters" working on the mines to 80 000 per year, the mining industry was short of at least 20 000 miners per year, as there was insufficient labour available elsewhere.[72]. Secondly, Tropicals, like other "East Coasters", were well suited to the rigours of underground work.[73] Therefore in November 1933 the South African government gave permission for "an experimental batch of 2 000 natives from North of Latitude 22° South" to be sent to the Witwatersrand gold mines.[74] The Tropicals were given special sleeping accommodation, food and clothing. The experiment was seen as a success by both the industry and the state, as only 25 miners died and a further 88 were repatriated (63 from disease and 25 because of mining accidents).[75] The mining industry was thus rewarded by the state with more Tropicals, and by 1937 there were 10 448 Tropicals on the gold mines. The Chamber's annual report for that year callously records that "these natives have proved themselves satisfactory from the efficiency aspect, and their mortality has not been abnormal, the death rate from disease since the commencement of the

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[71]The 1922 Mining Industry Board and the 1919 Low Grade Ore Commission both raised the issue of lifting the ban, but it was the 1932 Low Grade Ore Commission, UG16-1932, which finally lifted the ban.

[72]The shortfall could have been as high as 40 000 as "East Coasters" traditionally worked longer contracts than any other group. For a useful discussion on the labour shortage and possible solutions see UG16-1932 105-106.

[73]Tropicals apparently coped with the heat and humidity better than "Cape boys" underground, presumably because they came from a hotter climate. The fact that a number of the mines were getting deeper also increased the popularity of the Tropicals. It has already been shown that as the mines went deeper so the temperature increased.

[74]Paton argues that pressure from the recruiting zones also played a part in the lifting of the ban. Thousands of men were unable to find work in British Central Africa, nor were the Katanga copper mines, as a result of the Great Depression, able to recruit them. The colonial authorities were therefore willing, in 1931, to lift the ban on recruiting. Southern Rhodesia had first option on the labour as the Chamber only received the green light in November 1933 (Paton 40).

[75]COMAR, (1933) 21 and COMAR, (1935) 25. The average mortality rate for Tropicals for the first three years was about 12.5 per 1000 miners. The mortality rate, for the same period, of other African miners was about 7.5 per 1000 employed. On arriving at the place of work, Tropicals were given 26 days of surface work, fed three times a day, provided with more clothing and given a weekly medical inspection for the first two months. Packard speculates that because the pneumonia mortality rate increased slightly and the incidence of pneumonia more sharply, after their initial enthusiasm the mines must have slackened off, as they had already convinced the State that Tropicals could survive on the mines (White Plague 230-232). Hence, in 1940, the tropical mortality rate had increased to 6.15 per 1000 [COMAR, (1940) 22].

experiment being 15.28 per 1000".[76] In other words, "only" 160 Tropicals had died, on the mines, since November 1933. But the industry needed more labour and continued to apply for more Tropicals. By the end of 1939 there were 19 260 Tropicals on the mines and the mortality rate had decreased dramatically to 5.27 per 1000, largely as a result of the use of the drug M & B 693.[77]

Explaining a disease etiology is complex, especially in the case of pneumonia. It is therefore difficult to be certain as to why the Tropicals no longer succumbed to the disease. Perhaps conditions had significantly improved to prevent Tropicals from being infected so easily. However, this would not have been the only reason. It is possible that Tropicals had developed more resistance to the disease during their absence from the gold mines. Finally, as Packard has indicated in the case of TB, better medical examinations by the mine doctors prevented the weak from readily finding employment on the mines.[78] During the reconstruction period the labour shortage meant that mines were often willing to employ almost anybody, but three decades later the labour shortage was not so great and the mines were now much more discerning.

The mine authorities' approach to diseases such as pneumonia was paradoxical. On the one hand the authorities were arguing that "people who were susceptible to the pneumococci and other disease organisms through their previous isolation as well as by their low state of nutrition, were brought into an environment inhabited by an urban population consisting of a high percentage of individuals who had acquired immunity or partial immunity against these organisms, in other words, as population immunity was high, the chances of epidemics were low".[79] Thus it had to be the miners' fault that they did not have the proper immunity, which they could only acquire if they spent a long time in the urban area, but that was something the migrant system was designed to prevent. Then, on the other hand, the officials were arguing that the migrant system was ideal for the workers as it allowed them time to recover in the

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[76]COMAR, (1937) 22.

[77]COMAR, (1939) 22-23.

[78]Packard, White Plague 184-186.

[79]Malan 12-13.

rural areas. Yet it prevented them from acquiring immunity. Therefore " 'herd ' immunity in the compounds remained low - a situation highly inducive to the spread of infectious diseases".[80]

Tuberculosis

TB was by the 1920s the major killer on the mines. Yet, during the 1920s and the 1930s, mine authorities played down its importance, and focused instead on pneumonia. In White Plague, Black Labour Packard has examined a number of reasons why TB prevention was ignored for so long, not only on the mines but in South Africa as a whole. Crucial to his argument is the idea that "changes in the alignment of economic and political interests have," as they did in England in the 19th century, "also shaped the history of TB in South Africa".[81] But whereas in England the creation of a working class was relatively uniform, in South Africa the process was "slow and uneven". The primary reason for this was the migrant labour system.

Incomplete proletarianization of African miners had a profound effect on the epidemiology of TB. Three significant processes occurred. Firstly, labour migration led to urban-based epidemics spreading to South Africa's rural areas at a more rapid rate than occurred in either Europe and America. Therefore, for example, by the 1920s more than 90 per cent of the adults in certain parts of the Transkei and Ciskei had been infected with TB.[82] Secondly, the migrant system may have delayed the development of resistance to TB, as a balance between a African urban population and the TB bacilli never developed. Thirdly, the absence of political rights for African workers limited the ability of the workers to campaign for health reforms; "as a result much less reform has been achieved or even attempted in the conditions that contribute to high rates of TB among workers and their families".[83]

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[80]Malan 14.

[81]Packard, White Plague 10.

[82]TB is, of course, not the only disease that was spread by migrant labourers, many others were as well. See, for example, Jochelson's account on syphilis ("Tracking Down the Treponema"). A far more serious threat is currently posed by migrants spreading the HIV virus, for details see Jochelson, K., Mothibeli, M., & Leger, J-P., "Human Immunodeficiency Virus and Migrant Labour in South Africa," International Journal of Health Services 21 (1991): 157-173.

[83]Packard, White Plague 12.

Attempting to establish TB incidence during this period is no easy matter for any medical historian. The process is complicated by the number of cases that escaped notification, especially amongst African groups. In 1922 the Department of Health gave a "conservative estimate" that there were 3 000 cases of TB amongst whites and 15 000 cases amongst Africans in South Africa. Packard suggests that this figure is too small. Its only value, it would seem, is that it indicates how little the State health department knew about the health of its residents. The report had noted how the improved housing situation for whites was helping to keep TB incidence down, but that for Africans this was no help "owing mainly to their high racial susceptibility to the disease".[84] It believed alcoholism was "a potent factor in the prevalence and spread of the disease amongst them".[85] The department argued that the "most helpful line of attack was laboratory research, closely linked up with clinical investigation and field inquiries".[86] No mention was made of any programme to improve African housing or of feeding schemes for the malnourished. The problem was that the mines did not see TB as their problem, as shown by an article in the Journal of the Medical Association of South Africa which compared the TB morbidity figures on the mines with those elsewhere in South Africa and concluded that "it is the home not the place of business that dominate[d] spread and distribution of tuberculosis".[87]

In 1925 a joint venture of the State, the Chamber of Mines and the Natives' Deferred Pay Fund saw the creation of the TB Research Committee. Its aim was to investigate the incidence of TB amongst Africans in South Africa. The committee was heavily biased towards the mining industry, 12 of the 17 members having direct or indirect links with the Chamber. The Chamber jointly sponsored the committee, along with the State. The committee's report, which was issued in 1932, had a significant impact on health policy, deflecting it once again from environmental reform towards an argument of racial susceptibility, even though this was not a unanimous view.

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[84]Report of the Department of Health, UG8-1922, 149-150.

[85]UG8-1922.

[86]Report of the Department of Public Health, UG9-1924, 238.

[87]"Transvaal Mine Medical Officers' Association of South Africa," Journal of the Medical Association of South Africa 15 (August 1927): 395-398.

Furthermore, the report found that 60 per cent of miners repatriated because they had TB were dead within two years. The commission also did tuberculin tests on 93 979 miners, of whom 60 per cent had a positive reaction. The more positive the reaction, "the more likely the native was to develop tuberculosis".[88] The report also found that TB amongst Africans tended "to run a more acute course than in the white race".[89] Packard has pointed out, however, that the only reason why TB ran a more rapid course amongst Africans was that Africans usually only saw a doctor as a last resort. Hence doctors only saw patients as they were dying of TB.

It is interesting to note that although members of the SAIMR were part of the TB committee, the committee had nothing to do with the SAIMR. A major reason for this was that TB was never a "prominent field of study" for the SAIMR. Apparently the SAIMR's director, Dr Watkins-Pritchford, made some attempts to get the government to tackle TB more systematically but with little success. Malan notes that the reason the SAIMR had not played a greater role in the battle against TB was that "there was no one at the Institute at the time who was really interested in tuberculosis".[90] They were largely interested in the pneumonia goose chase, a chase that effectively tied up valuable resources that could have been used for TB research.

Packard's Thesis

The table below shows that according to the official figures for TB and silicosis, incidence apparently declined during the 1920s and 1930s. The mine authorities would therefore appear to have been justified in not paying more attention to the TB problem on the mines. Packard has shattered this illusion, as the following discussion indicates.

Acknowledging that by 1935 TB incidence had dropped from 18 per 1 000 in 1913 to fewer then 2 per 1 000 (Packard's figure) and that conditions did improve for the workers, Packard nevertheless argues

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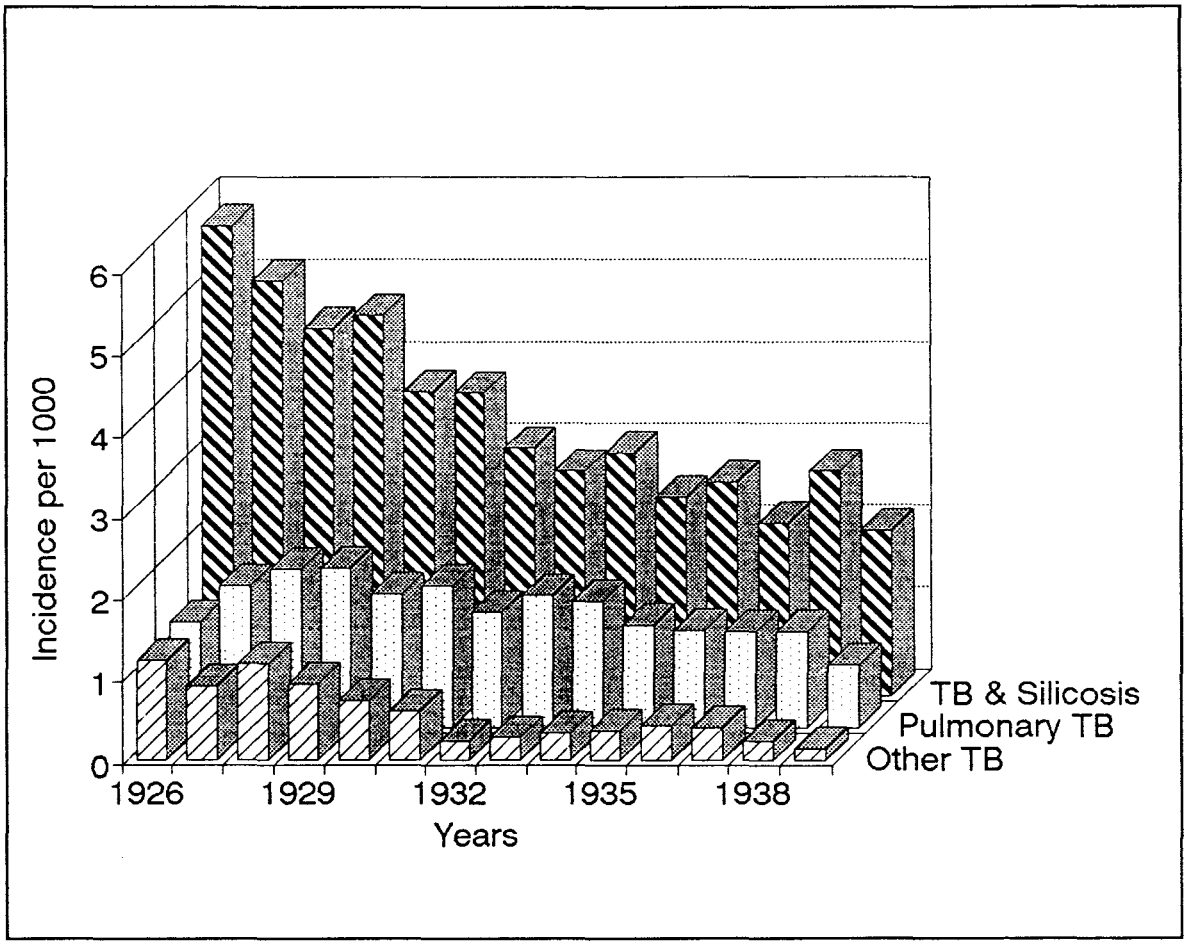
[88]Report of the Public Health Department, UG30-1933, 35.

[89]UG30-1933, 35.

[90]Malan 121-126.

that "as significant as these achievements were, they did not by themselves produce the dramatic



Graph 6: Incidence of TB and Silicosis, per 1 000, amongst African miners, 1926-1939 [91]

decline in TB rates".[92] Rejecting most earlier theories, Packard argues that improvements did not lead to the dramatic drop in TB incidence in the 1920s and 1930s. Overcrowding in stopes continued at best, and at worst actually increased as mines went deeper. Mines dug narrower stopes to save costs. Although the diet improved, Packard argues that it did not improve significantly, especially as scurvy continued to appear on the mines. Furthermore the miners continued to work long hours. Packard has

[91]Statistics taken from Packard and the Department of Health's annual reports (see Bibliography for details). Packard's TB totals drop more dramatically because he uses one group's mortality figures, the Central Mining - Rand Mines Group. The figures used in the table above are for all the African miners on the Witwatersrand. The Rand Mines Group, arguably, had the "best" health record on the mines and hence would have been below average in most cases.

[92]Packard, White Plague 161. Packard's figures are slightly different to the ones used in this thesis for the simple reason that his figures are taken from one mining house, whereas the figures in the graph above are taken from a number of sources (see footnote above).

also noted that the screening of new recruits, introduced in 1926, did not really work. For example, weak-lunged miners were simply assigned surface work where they were just as likely to get TB. The mines had also introduced a compulsory stethoscope examination, every three months, of "long service natives". Miners were apparently reluctant to undergo such tests and would often send a healthy friend if they thought they might not pass the test.[93] Thus medical examinations in the 1930s continued "to vary considerably depending on the needs of the mining industry". This in turn eroded the "effectiveness of preliminary screening as a defence against TB".[94]

Why, then, did the incidence of TB drop? Packard argues that the changing nature of labour composition on the mines was the most important reason why TB incidence was decreasing on the mines. The banning of Tropicals in 1913 had eliminated a high risk group. Furthermore during the 1920s and 1930s the labour surplus allowed the mines to be fussy. Mines could afford the luxury of holding back weak recruits at the recruiting compounds for a period to allow them to recover or to be sent home.[95] Packard also suggests that "learned experience rather then biological adaption may have played a more central role in the survival of experienced mineworkers".[96] An example of this was that by getting to the surface earlier miners received a better meal and also spent less time waiting in the

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[93]COMAR, (1926) 60.

[94]Packard, White Plague 179. J.F. Young, the WNLA doctor, lamented the fact that of the 4 605 miners rejected by mine MOs in 1929 3 326 of them had been recruited by other Witwatersrand gold mines. This led him to conclude that "a uniform basis for the rejection of mine natives does not exist" (quoted in "Transvaal Mine Medical Officers' Association," Journal of Medical Association of SA, 4 [October 1930]: 633). In 1939 the MMOA noted that the "periodical weighing of natives and stethoscopic examination of those found to have lost weight" was sufficient as a way of monitoring the TB situation on the mines. Furthermore, it noted that there was no need to increase the number of inspections by the MOs. It had also agreed that while suspicious cases should be X-rayed not all mine hospitals should be equipped with X-ray equipment (COMA, memo from MMOA to Chamber's Miners' Phthisis Medical Bureau, 22 November 1939). In 1944 Gluckmann found that there were only 100 radiographers in the whole of South Africa. Therefore had the mines wanted permanent radiographers to X-ray all the black miners there would not have been sufficient available (UG30-1944, 89). The process of weighing, according to Packard, was useless in TB detection as there existed considerable differences amongst the mines as to what could be regarded as normal weight loss.

[95]See comments in chapter four about overcrowding in the compounds. The combined effect of a labour surplus and the increase in profitability meant that compound managers were not only able to be more selective about who they recruited but they were able to ensure that there was always a labour reserve to replace ill or injured miners.

[96]Packard, White Plague, 190.

draughty shafts. A further factor was that Mozambican workers were being replaced more and more with South Africans, especially from the Eastern Cape, who had had longer exposure to TB. Finally, it was also the creation of the Assisted Voluntary System (AVS), in 1928, which formalized the recruiting of volunteers that led to the decrease in TB incidence. Volunteers were now medically inspected, and those who failed were rejected. But overall, as with the government's urban strategy of exclusion, the process was "ephemeral and in the long run unsustainable," sowing the seeds for future problems.[97]

Changes in the labour market, however, saw increased competition, which in the late 1930s and 1940s meant that the TB that had been pushed out of sight came back sharply into focus. Rural areas, which authorities had incorrectly seen as healthy backwaters, began to show visible signs of collapse. Employers began to complain about a labour force that was malnourished and diseased. Furthermore, the rise in manufacturing industry in the interwar years had increased the competition for labour. Coupled to the labour shortage was the manufacturing industry's need for a more stable labour force. This need led to many families in the 1930s moving from the rural to the urban areas. The absence of enough housing for this urban influx produced the inevitable: in the late 1930s the second TB epidemic broke out.[98]

For the first time in several decades the mining industry found itself faced with a labour shortage, and was no longer in a position to pick and choose its labour. Just as the second TB epidemic broke out in the urban areas so it did on the mines, something which the mine MOs found difficult to understand. After all, living conditions had improved, as had work conditions. There had also been improvements in the diet, water-borne sewerage was being introduced and the medical system was firmly established. But labour competition and increases in the size of the industry were taking their toll. Labour shortage and decline in productivity were the result.

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[97]Packard, White Plague 193.

[98]Packard has identified three TB epidemics in the twentieth century in South Africa. The first occurred at the turn of the century, the second in the late 1930s - early 1940s, the third began in the late 1980s.

The reasons for the increase of TB incidence on the mines were complex. Packard argues that the most significant factors were the reintroduction of Tropicals and the rise in food prices during the 1940s, because of the war, which encouraged ration skimping, which in turn affected the nutritional intakes of the miners and thus increased their risk of being infected. Packard correctly points out, as the table below illustrates, that "the fact that TB rates increased at all underscores both the extent to which conditions in the industry remained a threat to the health of African workers and to the fact that the earlier successes in bringing down the incidence of TB were based on historically specific conditions that were subject to change".[99]

YEAR	TB + SILICOSIS	SILICOSIS	TB	ALL PULMONARY DISEASES
1934	0.16	0.05	0.21	O.44
1935	0.15	0.07	0.22	0.45
1936	0.14	0.10	0.23	0.45
1937	0.13	0.11	0.24	0.46
1938	0.12	0.12	0.24	0.46
1939	0.11	0.13	0.25	0.47
1940	0.10	0.14	0.26	0.47

Table 6: TB and Silicosis Incidence (in percentages) amongst African Miners in the years 1934-1940.[100]

The above table shows that the production rates of TB and silicosis were increasing while the combination of the two decreased. A possible reason for the decrease in the combination is that diagnostic ability was improving and hence doctors were able to distinguish more positively between the two. Nevertheless, the increase in the 1930s proved that TB control, in previous decades, had been ineffectual.

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[99]Packard, White Plague 233.

[100]Schepers, G.W.H., "Occupational Chest Diseases in Gold Mines," A.M.A. Archives of Industrial Health 12 (July 1955): 33-47.

Packard has also examined the ideology behind the Medical Officers' response to the incidence of TB on the mines. He has noticed how mine MOs, by the 1920s, had shifted from their early theory which maintained that Africans were uncivilized and unable to cope with the complexities of modern life. Central to this theory was the belief that African people lacked a proper understanding of sanitation. It was supposed to be this misunderstanding that led to Africans succumbing to TB so easily.

This theory was gradually replaced with a biological one. The "new orthodoxy" claimed that "Africans were biologically ill-adapted to civilization" and stressed the "importance of physiological differences in explaining the apparent higher susceptibility of Africans to disease and particularly to TB".[101] Social Darwinism was thus resurrected, with this theory replacing the theory of "acclimatization". The notion having evolved on the mines about a decade before being accepted in wider medical circles, Packard suggests that its popularity was linked to economics, since theories of acclimatization meant a permanent labour force which was expensive. As TB mortality decreased in the 1920s and 1930s, doctors felt that the migrant labour system was vindicated. It was supposed to limit the exposure to TB and to provide opportunities for recuperating in the reserves. Labour stabilization in the cities would lead to exposure for Africans and prevent resistance, hence the rejection of Gorgas's views in 1914. Therefore, "preventing the spread of TB became, in effect, a radical rationale for the use of migrant labour".[102] This view undercut the calls for environmental reform in the compounds. Packard is led to conclude that "medical authorities on the Rand were, in short, either unable or unwilling to oppose the interests of the mine managers and thus unlikely to maintain medical opinions that conflicted openly with those interests".[103] There was continuity between the views: both blamed the victims and both reduced the authorities' responsibility.

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[101]Packard, White Plague 196.

[102]Packard, White Plague 201.

[103]Packard, White Plague 202.

Silicosis

TB and pneumonia were not the only pulmonary diseases that miners were dying of. Silicosis was another killer. The result of

> constant and continuous exposure to excessive amounts of respirable silica dust caused "dense fibrous nodules" to replace the spongy lung tissue. When removed from the body and placed in water, such a silica-damaged lung sank "like a stone", its weight being three times as great as that of an average lung.[104]

Silicosis, unlike TB and pneumonia, has no cure. The damage is irreversible; survival depends on not being affected. Prevention is thus of paramount importance.[105]

There exists today a number of historical studies on silicosis, the majority of which are characterised by their failure to explore the disease among African miners. Although the evidence as far as African miners is limited, one can put a few pieces together. It would appear that because African miners were only temporary sojourners on the mines, they were thought not to suffer as badly as did the more permanent white miner. This view was summed up by the secretary of public health, Dr E.H. Cluver, when he stated in 1951 that

> the total period of underground work by an African during his working life is in general not sufficient to allow of a dangerous accumulation of silica in his lungs.[106]

Katz has recently convincingly challenged this view, citing evidence from mine MOs, white miners and missionaries who witnessed countless silicosis victims from the daily grind of minework.[107] The perfunctory nature of medical examinations, the fact that post mortems were not required by law and the reluctance of mines to use X-rays on African miners meant that the majority of the silicosis sufferers were not identified by officials.[108] Whilst Katz concedes that one can "make few definitive assertions

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[104]Katz, PhD thesis 3.

[105]For an extremely readable account of the nature of silicosis and the path it follows see Katz, PhD thesis, especially chapter two.

[106]Cluver, E.H. Social Medicine (Johannesburg: Central News Agency Ltd., 1951) 301.

[107]See especially pages 792-811 of Katz's PhD thesis. See also Leger, J., "Occupational Diseases in South African Mines: A Neglected Epidemic?" South African Medical Journal 81 (February 1992): 197-201.

[108]Katz, PhD thesis 755-798.

concerning the prevalence of and mortality from silicosis" it is nevertheless possible to "conclude with certainty that there was a high prevalence of simple silicosis amongst contract workers".[109] This is arguably borne out by the alarming statistic produced by the 1932 Low Grade Mines Commission to the effect that by 1931 18 767 African miners had claimed a total of £836 359 compensation on the basis of suffering from silicosis.[110] Furthermore, Orenstein recorded that by the late 1920s more than 10 per cent of the African miners employed by Central Mining-Rand Mines had been working for more than five years on the mines.[111]

In the first couple of decades after the South African War, African miners were not compelled to have a medical check-up before they left for home. African recruits were only radiographed from the 1950s onwards; however from 1926 all "long-service" African miners underwent an X-ray.[112] The Stallard Commission had, to no avail, criticised the fact that pre-recruitment medical examinations were "not adequate judging from the high incidence of pulmonary tuberculosis among repatriated employees" and consequently recommended that "all native employees should again be examined clinically and by X-ray photography at the end of each period of service on the mines".[113] It was therefore quite possible, as African miners were exposed to as much if not more dust than white miners, that thousands of miners returned to the reserves with silicosis. Silicosis and TB often go hand in hand and are difficult, if not impossible, to distinguish without X-rays. Miners repatriated with TB may well also have had silicosis.

There are some statistics available on silicosis. However, Katz argues that these figures are unreliable as they "are at least two or three times too low".[114] In 1909, for example, 1 228 silicosis deaths on the

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[109]Katz, PhD thesis 808.

[110]UG16-1932, 41.

[111]Orenstein, "Report for the Year 1936" 35.

[112]"Long-service" miners were those who had served continuously for more than five years on the mines (Katz, PhD thesis 69).

[113]Majority Report of the Miners' Phthisis Acts Commission, 1941-1943, UG22-1943 29.

[114]Katz, PhD thesis 870. Katz also points out that most of the official commissions on silicosis questioned the reliability of the statistics.

mines were recorded; 1 027 of these deaths were African miners. The Buckle commission found evidence of 624 cases of silicosis amongst African miners in the period 1 August 1912 to 31 March 1914.[115]

It was estimated in the period 1902-1910 that, on average, a Cornish miner could work about four years on the gold mines before being affected by silicosis and dying from the disease. It is therefore probable that at least a similar incidence must have occurred amongst African miners who served on the mines over a longer period and who continually renewed their contracts. African miners were migrants and hence after their contracts ended they were sent home, a process that led to about a 100 per cent annual turnover. Nevertheless, miners who came back year after year would have increased their chance of becoming affected.[116]

It was in February of 1914 that the Miners' Phthisis Prevention Committee drew the Chamber's attention to the high incidence of TB sufferers who had initially had silicosis. The committee also noted how miners who had first been turned away at one mine, because they were TB sufferers, simply went from mine to mine until they were recruited. In this period most mines did not make medical inspections of voluntary labour, as these inspections were very unpopular with the workers. The Committee recommended that the Mine MO should inspect their work force about once a week and that compound conditions had to improve.[117] In July of 1914, the Miners' Phthisis Prevention Committee wrote to the Minister of Mines, stressing that

> the seriousness of TB superimposed on silicosis in cases of Miners' Phthisis is so great, and the occurrence of TB on the mines of the Rand is so frequent, that it is of the utmost importance that all possible precautions be taken with a view to preventing persons who are suffering from active tuberculosis being employed on the mines and thus probably serving as centres of infection.[118]

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[115]Annexure 17, UG37-1914 118-119.

[116]Richardson, P., "Miners' Phthisis in the Transvaal Gold Mining Industry, 1886-1918," presented at the African Studies Association of Great Britain Conference, 1978, 12-13.

[117]COMAR, (1914) 16-23.

[118]COMAR, (1914) 16-23.

In his book Packard shows how the above statement was characteristic of the health policy in vogue during this period. It was a policy that segregated and repatriated the ill rather than ensured the patients' recovery.

It is well documented that the State passed a number of acts to protect white miners. White miners also received compensation and by World War Two were being X-rayed regularly. African miners were not so fortunate. While they eventually received compensation, repatriation and the absence of X-rays at the completion of their contracts meant that it was difficult to claim compensation once they were back in the rural areas.[119] While African miners received compensation, as laid down in Act 19 of 1912, it "was not only relatively small, but the mining authorities also did very little to inform their African employees about their legal rights to compensation. The mines neglected to report cases of silicosis amongst Africans and the law did not compel the doctors to report such cases themselves".[120] African miners received compensation of between £10 and £50 for silicosis, whilst white miners received between £380 and £500.[121]

White miners seeking compensation went before a board that was independent of the mining industry, but African miners were assessed by mine doctors. Buckle thought this practice was problematic when he remarked to a witness that

> it is not a businesslike arrangement to place the decision as to whether a mine should pay compensation into the hands of the employee of the mine, which the doctor is in a good many cases. That is not a practice that is followed in ordinary business life. You put such a thing in the hands of an independent person as a rule. One hopes that

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[119]Major Cooke, in evidence before the 1931 Native Economic Commission, stated that "a large number of Natives" never received the compensation they were entitled to (TA, K26, evidence collected by the Native Economic Commission, 4 May 1931, 7218).

[120]Van Aswegan, H.J., "'Miners Phthisis': Health Politics on the Gold Mines of the Witwatersrand, SA, 1886-1920," paper presented at the International Mining History Congress, Bochum, September 1989, 14.

[121]COMAR, (1936) 109-111. White miners who had died from silicosis also had their funerals paid for and attempts were made by the mines to find jobs for their dependents. African miners received no such help. All compensation was determined on a sliding scale dependent on the miner's disability and what their wage had been at the time of diagnosis.

> the doctors do not abuse the position, but they have the opportunity.[122]

A further problem was that mine doctors were sometimes examining as many as 1 000 miners per hour and consequently were not in a position to judge who was affected by silicosis and who was not.[123]

A major factor in the compensation of patients on the mines was that it was not unusual for the doctor to be unable to make a diagnosis. In many instances doctors misdiagnosed the illness. In part misdiagnosis occurred as the result of inadequate medical knowledge about the disease, as well as not communicating with the patient. A delegation of mine doctors to the NGC explained their diagnostic techniques to Buckle as follows:

> You treat a native as you treat a child. You have to find out what is wrong by medical examination [because] you cannot rely upon the statements of the Native in anything with regard to medical treatment... A Native never reports with a chronic illness. He goes on working until he collapses. He has not yet the sense to say that he is losing flesh or his breathing is not so good as it used to be.[124]

Not all doctors found this acceptable: one in particular, Dr J.F. Young, who was attached to WNLA, complained "it was difficult to believe that they [miners] had been examined by mine medical officers at all. Some were probably under 15 years of age. Others were suffering from advanced tuberculosis and had to be repatriated at once".[125] This widespread failure to diagnose silicosis meant patients could not claim compensation, and makes all the (low) statistics of the time unreliable.

The attempts by the Chamber to prevent silicosis contrast sharply with the little the Chamber did to prevent either TB or pneumonia. In the period between 1910 and 1929 nine Acts were passed by parliament, five government commissions were instituted and ten select committees discussed the

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[122]TA, K358, H.O. Buckle in discussion with S.V. van Niekerk, the NAD's MO and mine inspector, evidence to the NGC, 27 April 1914.

[123]UG37-1914 52. Mass inspections involved the MO and some assistants examining the workers as they marched past at the end of their shift. Miners with visible injuries (cuts, abrasions) were pulled aside for a more thorough examination.

[124]TA, K358, evidence of a delegation of mine MOs to the NGC, 3 March 1914.

[125]Cited in "Transvaal Mine Medical Officers' Association," SA Medical Record 24 (March 1926): 137.

disease. However, most of this concern focused on white miners.[126] By 30 September 1929 the mines had given £11 208 015 in compensation to white miners and had constructed two silicosis sanatoria. African miners in the period 1 May 1911 to 31 July 1929 received £702 036 in compensation.[127]

Amendments to the Native Labour Regulation Act led, by the 1930s, to all miners being medically examined at the end of their contract. This was to ensure that miners with silicosis were diagnosed and were then able to claim compensation. But, once diagnosed, a miner was not in a position ever to work on the mines again. Miners were aware of this and so if they suspected they were ill they sent a colleague to the examination.[128]

Miners' attitudes to the health system

The miners' first introduction to the system was invariably through some form of mass medical examination, which many miners found embarrassing as they were forced to strip in front of other men. What aggravated the situation was that often circumcised men were stripped in the presence of uncircumcised "boys", a practice which is taboo in most African societies.[129] A medical examination usually followed the procedure outlined below:

> Line up all the natives entirely stripped (they must not be allowed merely to drop their trousers) about 20 feet away from the medical examiner. Make each boy walk towards the examiner, observing his gait and whether he is lame etc. When about 5 feet from the examiner, cause him to rise on tip-toe, then squat, then rise again, then extend both arms above his head, extend the arms to right angles to the body laterally, then forward, then flex the elbow joints. When in this position cause him to clench and open his hands, and then rotate each arm parallel to the long axis of the body. These motions, which take less than a minute, will enable the examiner to judge whether all the joints are sound in function. Ask the Native a simple question in an ordinary voice to ascertain whether he is deaf. Look at his ears, his gums and teeth. Cover each eye

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[126]"Statement by the Chamber of Mines to the 1929 Miners' Phthisis Commission," in COMAR, (1929) 65-104.

[127]COMAR, (1929) 105-114.

[128]TA, K26, Evidence of Major H.S. Cooke, Director of Native Labour for the Union and Chief Native Commissioner for the Witwatersrand, to the Native Economic Commission, 4 May 1931, 7216. White miners with silicosis, on the other hand, were invariably found work by the Chamber.

[129]Moodie, "Social Existence" 44-45.

> separately, and ask him to count the fingers of your hand to test for blindness. Look at the skin noting the presence of any large scars or varicose veins, or hernias, or flabbiness of muscle or skin. Now examine the heart and lungs.[130]

At the WNLA compound, which the majority of the recruited miners visited at some point in their stay on the Rand, miners not only underwent a medical examination but were also forced to walk through a dipping tank. Miners who were rejected by these medical inspections simply went to a gold mine where volunteers were not checked and signed up for work there. When the miner's pass was endorsed to the fact that he was not fit for mine work he would tear it up and allow himself to be arrested. Upon his release he would be issued with another pass and could therefore try again to find employment on a gold mine.[131] It would appear that voluntary labour not only served as a means by which miners could find work on the mine of their choice but it was also a way of avoiding medical checkups on the mines. The mine managers knew this and therefore did not impose checkups on the volunteers, as they knew it would make the mines unpopular. For much of the period under discussion the state only stipulated that recruits must be examined, therefore the mines were not required to examine volunteers.

Ill miners probably sought medical help from both the mine MOs and traditional healers, although not necessarily in that order.[132] Miners from Zululand, on the Modder B gold mine, complained that they were not allowed to take their own herbal medicines, so the mine manager agreed that they could. Apparently he feared that his mine would not attract any volunteers if he forbade recourse to a herbalist. However, he stipulated that he would give them 24 hours in which to show evidence of an improvement in the patient's condition. If the patient was showing no signs of recovery after a day the miner was

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[130]MMOAA, minutes of the MMOA, 23 October 1922.

[131]TA, K358, evidence of R.W. Currin, compound manager of the New Rietfontein gold mine, to NGC, 5 February 1914.

[132]Whilst not much written evidence exists of traditional healers practising in the compounds, there are photographs of these men. However, there must have been healers working in the locations, just as there are to this day. Janzen in his study of health systems in Zaire found that the ill often sought help from a variety of people associated with health care, including both western doctors and traditional healers. The choice and management of the patient's therapy was usually determined by a "therapy managing group" who were kin, or close friends, of the patient. For more details see Janzen, J.M., The Quest for Therapy: Medical Pluralism in Lower Zaire (Berkeley: University of California Press, 1978).

sent to hospital.[133] In most cases miners were extremely reluctant to report to the hospitals as any confinement meant that their contract was drawn out further. Miners were not paid whilst they were recuperating in the mine hospital; moreover, they were usually expected to do "light work" in and around the hospital, for which they were not remunerated.[134] A constant complaint of the ill was that they were confined to hospital from which they were not allowed to leave and where they often were not allowed to receive visitors.[135]

Attempts by doctors to operate on ill miners without proper consultation with the patient's families or friends sometimes proved quite disruptive for the mines, as the following example illustrates. A Doctor Hawarden recounted the following story to a MMOA meeting:

> **DR. Hawarden** said that on a Monday a very bad abdomen case came into hospital. The position was explained to the patient, who through an interpreter, said: "Do what you think best". Help was obtained and the operation took place in the afternoon. The condition of the patient was very bad, and the next day the compound manager came in and said that there was a row in the compound because of this operation. The compound manager added he hoped to Heaven that he (the native) would not die. He (Dr Hawarden) said that he was afraid he would, whereupon the compound manager said, "Oh Lord, then there is trouble coming". (Laughter) Two days later the patient unfortunately died, and then the trouble really began. The compatriots of the man refused to go to work or bury the body. They would do nothing. He (Dr Hawarden) was asked to go to the compound to talk to them. He argued with them for half an hour and then left. About half past ten at night he is called up again, and found Mr Taberer and others from town and the local authorities. There was a long indaba until midnight. It was a very long job, and only at midnight did Mr Taberer manage to get a joke in. When he did that he was "getting on" with the boys. (Laughter) Well, the result of the whole thing was that the company compensated the relatives of the deceased.[136]

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[133]TA, K358, acting compound manager, C.L.Butlin's, evidence to the NGC, 5 February 1914.

[134]UG37-1914 25-26. Miners also complained that they were underfed, largely the result of the doctors placing all patients on "milk only" diets (UG37-1914 24). Furthermore, most of the mine hospitals forced miners who reported sick to swallow a dose of castor oil on their arrival at the hospital (UG37-1914 27). Both these factors contributed to the reluctance amongst African miners to use these facilities.

[135]TA, K358, Dr J.B. Gilchrist, mine MO for Block B of the Langlaagte Estate gold mining company, evidence to the NGC, 27 October 1913.

[136]This account was told by Dr Hawarden to the MMOA and was reprinted in "Refusal of Natives to Undergo Necessary Operations," PMMOA 1 (May 1921): 5-7.

Conclusion

Mine authorities used different strategies to combat the three major killers on the mines. Government officials and the State's medical research arm were obsessed with finding medical solutions to disease problems rather than implementing social and economic reforms. Valuable resources were thus tied up in the vaccination goose chase. Only in the area of silicosis did the State usefully intervene on behalf of the miners, and then only because a sector of the white electorate was directly involved. Obsessed with vaccinations rather than amelioration of conditions as a result of cost constraints, the health situation was fraught with racist theories which blamed the victims. Authorities blamed the failure of the pneumonia vaccine either on the doctors who administered the vaccine or on the miners who refused to be vaccinated. TB was seen as a disease that miners brought to the mines from the rural areas. Silicosis was invariably the fault of the miner who had not used the legislated preventative techniques. Furthermore health policy was also characterised by the practice of repatriating and segregating when no cheap cure could be found. Miners' lack of immunity and decadent lifestyles were seen to be the reasons for high incidence of diseases.

A common problem when writing medical histories is that one tends to focus largely on the work of the doctor and not on the patient, especially as the records are usually the records of the doctor's perceptions about the patient, and not necessarily what the patient was actually complaining of. The evidence of what the patient thought remains a blank. Although it is clear that African miners were well aware of pulmonary diseases, referring to them as "chest-ache", it is not clear at all whether they could distinguish between them.[137] This area of miners' perceptions of their diseases, as mentioned elsewhere, needs to be urgently explored.

Lack of data has also hindered this study in another area, namely that of African miners' silicosis. Issues that need to be addressed in this area include the incidence of silicosis amongst African miners and how miners were affected by longer contracts.

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[137]TA, K15, evidence of A.W.G. Champion, Chairman of the Native Mine Clerks Association, to the Mining Regulations Commission, 20 January 1925, 2134.

Examining pneumonia on the mines reveals a lot about the mine doctors, especially when remarks such as the following by Dr G.A. Turner are encountered. Dr Turner pointed out that Tropicals needed more warmth "because of the radiating power of their black skins and the peculiar shape of their nostrils," which made Tropicals more susceptible to pneumonia.[138]

[138]Turner as quoted in Baker (24-25).

Chapter Six

"Dead men tell no tales": Mining Accidents on the Witwatersrand Gold Mines

> It is well known to the directors that hundreds of men lose their lives annually through carelessness on the part of the miners and apathy on the part of the officials, and yet, speaking generally, they appear to make no personal effort in attempting to have matters improved in this direction. It is difficult to understand this anomalous attitude: the explanation may lie in the fact, as the old adage has it, that 'dead men tell no tales'. Certainly a live kaffir who has been assaulted is in a position to do a great deal of harm on his return home by persuading his friends not to allow themselves to be recruited.[1]

In 1961, shortly after the Coalbrooke mine disaster, Jack Simons wrote an innovative article on gold mining accidents in South Africa. The period he examined is similar to that examined in this chapter, namely, 1900-1939. Simons stressed the role of the colour bar in maintaining the high rate of accidents, for it led to African miners seldom being properly educated in safety measures as the predominant view was that they were not endowed with "a regard for safety, a sense of responsibility, and a capacity to exercise control over others". He also noted that the nature of underground supervision removed responsibility from African miners. Precisely because they were not involved in the making of decisions a low standard of accident prevention resulted, with "the rigid and unrealistic separation between supervisory and manual processes mak[ing] for carelessness and inefficiency". Finally, Simons argued that the relatively small compensation given to African miners did not provide sufficient incentive for mining companies to be financially concerned about safety.[2]

Reassessing Simons' article, the following chapter explores the high incidence of injuries throughout this period, the nature of these accidents and how officials reacted to them. The issue of compensation, paid to either the injured miners or to the families of miners who were killed, will also be discussed.

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[1]Annual Report of the Government Mining Engineer, UG49-1911 111. See also Simons, J., "Death in South African Mines," in Africa South, 5 (July - September, 1961) 47.

[2]Simons, "Death" 43-51.

Types of Accidents

Within an industry that faced several profitability crises during the period under discussion, poorly accommodated, ill fed African workers were expected to work. Furthermore the lack of proper training meant that many of the African workers were ill-equipped to handle the extremely dangerous work underground.[3] Not surprisingly African miners with inferior training were involved in numerous accidents, accidents which killed more than 15 000 African miners in this period.[4]

These accidents were officially categorised as follows: **Rockfalls**, according to the GME, would have occurred as the

> deep levels get opened up and the pressure increases, the strain on small pillars and open stopes reaches the breaking point: areas give way on weak fault planes or over improperly supported excavations, pillars burst and stopes and levels crush, all causing increased expense at lower levels, and killing, injuring, and frightening the underground labourers.[5]

Machinery, usually in motion, was an obvious danger. The type of machinery involved included "wire rope haulage" and conveyor belts.[6] Presumably this category also included accidents from the stamp mills as well as accidents involving drills. The "wire rope haulage" was particularly dangerous, as the following illustrates:

> In raises and winzes, minor accidents often occur owing to the natives catching hold of the rope to assist them in climbing up long inclines. They trudge along unconcernedly and their hands get drawn into pulleys.[7]

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[3]In chapter two mention was made of the fact that in the period under discussion it would appear that African miners were seldom told what was expected of them underground until they actually got underground. Those who were going to end up as drillers, the majority of miners, would be given a probationary period of about fourteen shifts to learn to drill. There were some differences between mines and also in approaches to the training. By the 1930s mining schools were being developed on the mines to give instruction in underground work (TA, K26, evidence of H.M. Taberer to the Native Economic Commission, 6 May 1931, 7379-7387.) However, as was mentioned previously, training given by the mine management was invariably in Fanakolo, a foreign language to all recruits.

[4]Baker 28. The annual reports of the Chamber of Mines confirm these figures. These statistics do not include the thousands of miners who were repatriated and went home to die.

[5]Annual Report of the Government Mining Engineer, UG40-1913 114.

[6]UG40-1913 114.

[7]A.L. Pretorius, Inspector of Mines for Brakpan, quoted in the Annual Report of Government Mining Engineer, UG18-1932 59. Raises and winzes refer to "tunnels which connect drives on different levels and follow the plane of the reef. When driven upward they are called 'raises' and when driven downward they are

Accidents involving **trucks** and **tramways** typically occurred while the trucks, which carried either miners or rocks to the surface, were being coupled. Trucks also occasionally overturned or ran out of control. **Falling of material** included "all accidents arising from the fall of timbers, tools or other articles, and from loose stones rolling down workings or falling from skips".[8]

From about 1907 the **rockburst** (in the statistics these have been included under rockfalls) became prominent on the Witwatersrand gold mines,

> and like artificial ventilation, was enshrouded in a good deal of mystery. It is generally recognised that these pressure bursts are the result of altered strains and stresses due to large excavations and deep mining and intimately connected with faults, fault planes, and other lines of weakness.[9]

However, well into the 1920s in certain quarters the rockburst was seen to be unavoidable. In contrast the GME repeatedly warned that there "is still a tendency in some quarters to regard rockbursts or 'air blasts ' as acts of God and unavoidable and it should be insisted upon that this cause of rock fall, or burst, follows naturally upon a certain method of mining, and must be provided for and guarded against in all workings, whether in travelling ways or stope faces".[10] The important point about rockbursts was that the deeper the mine the greater was their chance of occurring.[11]

Miners also **fell in shafts and excavations** or were **struck by the skip or cage.**[12] **Travelling by cage or skip** also posed certain dangers either in motion, or during embarkation and disembarkation.

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known as 'winzes' " (Cartwright, The Gold Mines 331).

[8]UG40-1913 119.

[9]UG40-1913 114.

[10]The Annual Report of Government Mining Engineer, UG40-1921 48.

[11]Rockbursts increase exponentially below about 6 500 feet and have consequently become the major cause of accidents in the mining industry today. For more details see Leger, J-P., "'Floods of Blood': Accidents and Disease in South African Mines," unpublished, (n.d.) 5-6.

[12]Shaft sinking was extremely dangerous work, not only because of the excavations but also because there was enormous pressure on the miners to work as fast as possible. The longer the shaft took to be constructed the longer it took for the mine owners to recoup their investments. For a comprehensive discussion of this issue see Guy et al. 257-278.

Haulage ropes breaking or **overwinds** did not fall under this category, but were a further category of accidents.

Accidents would occur when either the rope/chain hauling the cage/skip broke or when the rope/chain struck someone. In one serious accident on 17 December 1924, at the South Vertical Shaft of the Randfontein Estates gold mine, one white and thirty three African miners were killed. In this incident the winding rope broke:

> The shaft is 5000 ft, but the persons were only being lowered to the 24th station, about 3500 ft below the collar, and the cage was closely approaching the station when the rope broke...The engine-driver stated at the official enquiry that he had just brought his engine to rest at the 24th station mark on the depth indicator by means of the west drum brake, when he noticed a kick, the interval being a matter of seconds. He then put on the brake on the east drum, and subsequently found that the east rope had lost weight...The cageman was waiting to receive the natives at the 24th station, and stated that he saw the bottom of the cage when it was about 15 feet from the landing; after that he heard a crack and he ran away. Finding afterwards that the cage had disappeared, he rang the accident signal. The cage fell into water at the bottom of the shaft and was broken to pieces, the occupants being all killed.[13]

Where short ascents or descents were being made which were too steep to allow for easy passage, **ladders** were used. On occasion miners either fell off them or the ladders broke.

The following example illustrates what is meant by **overwinding**. The accident occurred on 1 October 1918 on the "Farrer" incline shaft of the Driefontein section of the East Rand Proprietary Mines (ERPM), which resulted in the death of twenty African miners and the serious injury of eight others.

> When raising the shift on the morning above stated the engine driver was overcome with a sudden attack of Spanish influenza, and was unable to reduce the speed of travel, or to apply the brakes. In consequence, the cage containing forty one natives was drawn right up into the headgear. It struck the sleeve, and the winding rope became disconnected from the shackle...The cage then fell back, but being off track ...it was brought up at the collar of the shaft. The crash of the cage in the headgear had the effect of suddenly relieving the driver from the paralysis which had seized his arms. He shot off steam and applied the brakes...There was no eye witness of the occurrence in the engine room, but the medical evidence supported the driver's

[13]The Annual Report of Government Mining Engineer, UG42-1925 59.

explanation of the accident.[14]

The type of accident caused by **electricity** would encompass miners coming into contact with unprotected wires, and being careless when working with electrical power sources. The voltages varied in range between 200 volts and 3000 volts. **Boilers and steam pipes** sometimes exploded or simply leaked causing accidents.

Accidents generated by **explosives** would occur during charging, drilling into unexploded holes, handling detonators, or during blasting operations, withdrawing charges and in reusing unexploded charges. A classic example of such an accident occurred on 16 December 1925, on the Driefontein Section of the ERPM in which one white and seven African miners were killed.

> The miner was late in completing the drilling of a drive face and took his explosives and fuses up to the face and started to charge up before the drilling of the last hole was finished. Available evidence showed that this last hole intersected a misfired hole which had been overlooked by the examining shift and an explosion occurred which also exploded seventy pounds of explosives which the miner had brought to the face. The miner and the whole of his gang of seven natives were blown to pieces and damage was done as far as five hundred feet back from the face.[15]

By the late 1920s a safer type of explosive was being introduced. A major problem with earlier types was that they tended to freeze at temperatures below 52 degrees Fahrenheit, not necessarily a problem at the bottom of a mine shaft but certainly a problem on a winter's evening on the Highveld. The newly designed explosives apparently did not freeze.[16] Slow-burning explosives could also cause accidents. On 21 July 1910, on the Simmer and Jack mine, one white and twenty seven African miners were killed by inhaling fumes from burning gelatine. A miner who survived the accident had placed a lighted candle next to the gelatine which set fire to it. The guilty miner was fined £50 or three months hard labour.[17]

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[14]The Annual Report of Government Mining Engineer, UG38-1919 50. Howard Phillips also makes reference to this particular accident. According to Phillips the driver was not prosecuted as the court accepted the doctor's testimony, in which Spanish Influenza was blamed, and the driver was advised to rest for at least a month ('Black October' 2).

[15]The Annual Report of Government Mining Engineer, UG37-1926 48.

[16]Watermeyer et al. 143.

[17]The Annual Report of Government Mining Engineer, UG34-1911 78.

Miscellaneous accidents would include falling and slipping, burning and scalding, splinters, "inundation with water" and heatstroke. Also under this category would fall explosions caused by methane gas.

> These occur in the deeper workings and seem to be due to pockets of inflammable gas, most likely methane, which are probably imprisoned under pressure in clefts or cavities and which escape into the drive when the cavity is tapped... The explosions are not numerous enough to call for special precautions, but when they have occurred have generally resulted in injury to someone. The only precaution that seems reasonable is to be on guard whenever the hissing noise of escaping gas is heard issuing from the rock.[18]

Other accidents caused by gas included the explosion of acetylene from carbide lamps. The GME noted that in 1928, for example, unidentified inflammable gas was found on three separate mines: City Deep, Robinson Deep and Crown Mines, at 6 746 feet, 5 341 feet and 4 675 feet respectively.[19] In 1933 on the Witwatersrand Gold Mine Company, an unidentified gas, which the GME thought might have been "Sulphated hydrogen gas", claimed the lives of two white and five African miners and injured thirty two others. Apparently the miners were draining a large underground lake that produced toxic fumes which they inhaled.[20]

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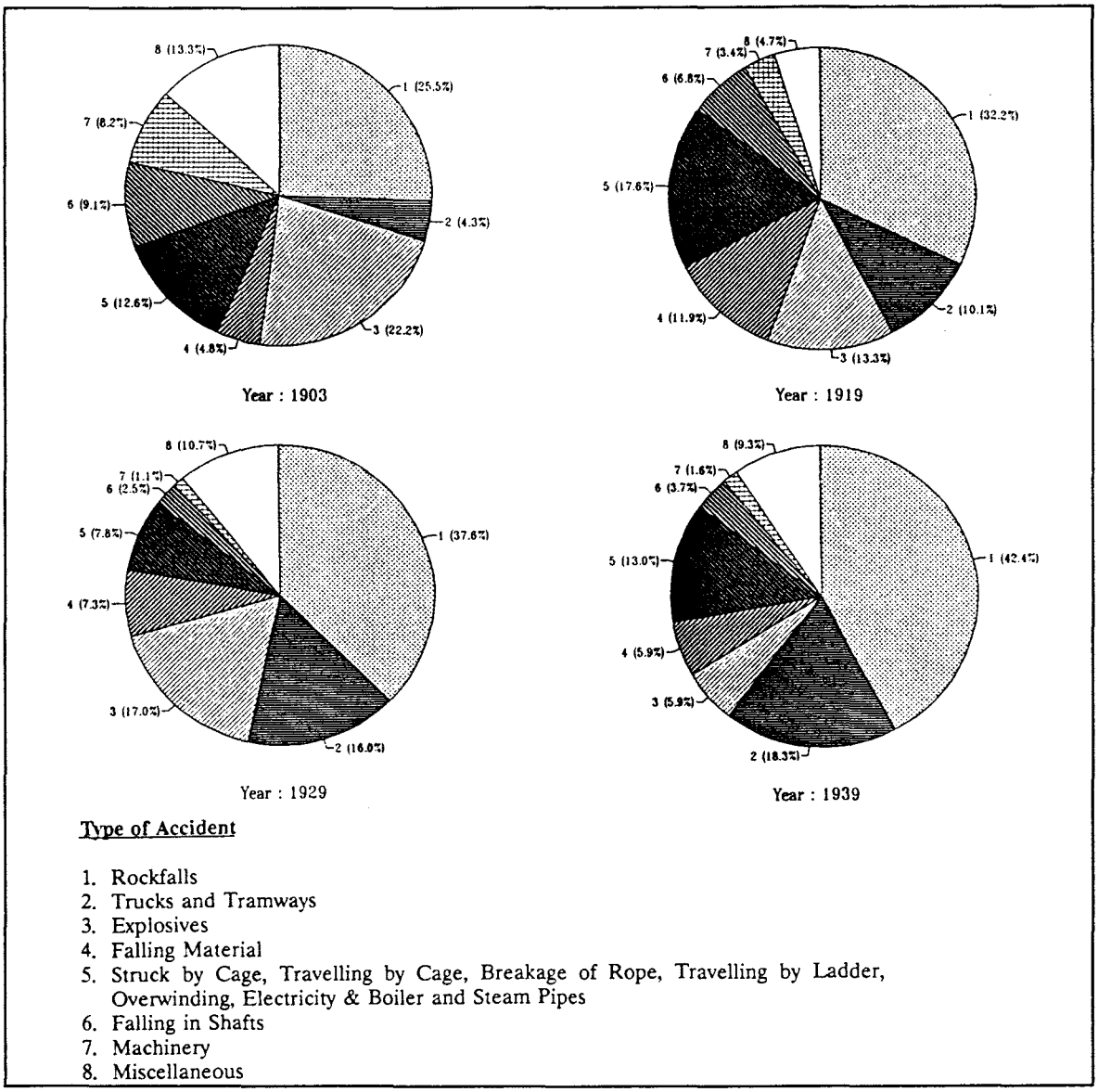
[18]UG40-1913 127.

[19]The Annual Report of Government Mining Engineer, UG34-1928 67.

[20]The Annual Report of Government Mining Engineer, UG13-1933 60.

The incidence of different types of mining accident can be categorised as follows:[21]



Graph 7: African Miners' Deaths per Type of Accident, in Percentages, for Select Years.

The types of accident that increased significantly were rockfalls and accidents involving trucks and tramways. Certainly increased depth played a major part in rockfalls. It is not apparent why there should have been an increase in accidents involving trucks and tramways, but possibly as the mines got deeper and the distances became longer more opportunity was provided for accidents of this nature to occur. The increase in underground temperature may also have influenced these types of accidents.

[21]Information taken from the Annual Reports of the Government Mining Engineer for 1919, 1929 & 1939.

The decrease in accidents involving explosives was directly due to miners, by 1930, being expected not only to be using a newer form of detonator but also to wash out unexploded holes to check that no explosives remained. Similarly the decrease in accidents involving machinery was the result of greater awareness of the dangers of such machines as well as better training for those miners involved with machinery.

A further reason was undoubtedly the fact that, increasingly, mine complements were largely made up of returning miners who had had previous experience on the mines and were therefore more safety conscious than "new" miners.

Accident Statistics

The British labour historian, John Benson, has argued that "it is not easy to distinguish between a disease and an accident, or between a disease that was caused by working in the pit and one that was aggravated by it; and it is certainly unwise to place too much faith in contemporary diagnosis and explanation...any certainty is probably misplaced".[22] Though writing about accidents in relation to sickness in the British coal mining industry, he could just as well have been writing about gold mining accident statistics.

For the gold mines the accident statistics, outlined below, are all taken from the Annual Reports of the Government Mining Engineer, which means that only accidents reported to the State would have been recorded.[23] Furthermore, for an accident to be included it would have had to have been "prescribed by regulation such as results in the injured person being disabled for at least fourteen days "(Heading on all GME statistics). Thus it is likely that although there might not have been too many deaths that went unreported, there could well have been any number of injuries that were not recorded. Not least of the factors accounting for incorrect statistics would have been that African miners reporting minor injuries would normally have been confined to hospital; and because they were paid per shift worked, such

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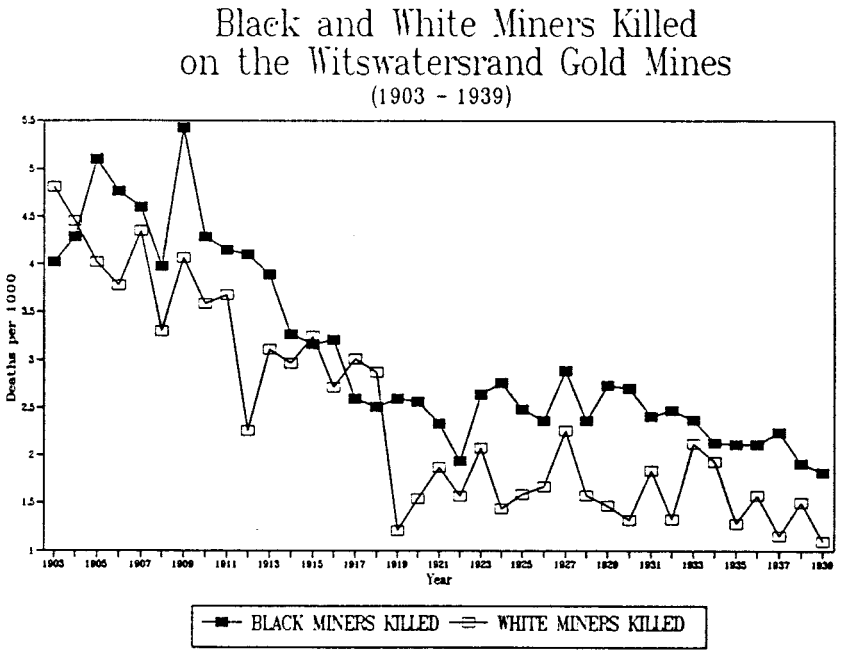
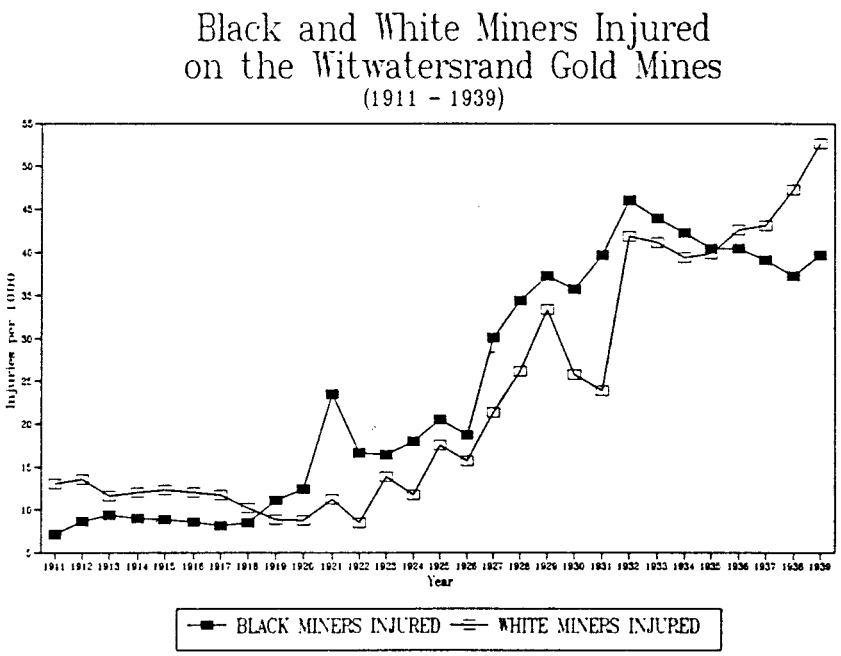
[22]Benson 7.

[23]The 1911 Mines and Works Act required that mines provide "ambulances and medical aid in case of an accident" and record statistics relating to accidents. Furthermore, inspectors, who reported to the GME, were also required to inspect, where possible, the scenes of the accidents (Act no.12, Mines and Works Act, 1911).

confinement would have meant that their contract would have been lengthened considerably, and thus "minor" accidents often went unreported.

Injury and Mortality Graphs (8 & 9)[24]





[24]The information for the above two graphs was compiled from the annual reports of the Government Mining Engineer, 1911-1939, and from COMAR, (1940) 132. Comparable accident statistics are difficult to come by, because the gold mines were significantly deeper than anything else on the continent. For example the underground mortality rate on the Zambian copper mines, in the 1930s, oscillated between 10 and 20 deaths per 1000 miners employed (cited in Luchembe, C.C., "Finance Capital and Mine Labour: A Comparative Study of Copper Mines in Zambia and Peru, 1870 -1980," PhD thesis, University of California, Los Angeles, 1982, 271).

The two graphs above reveal the fact that while the mortality rate from accidents was decreasing the injury rate was increasing. The question of the increasing injury rate is a complex one. Either miners were surviving accidents better than their predecessors because of improved medical treatment; or the collecting of data on mine accidents had become more efficient and consequently more realistic. What is of considerable interest is that there is little difference between African and white accident and mortality rates. The danger underground was clearly an issue for all, as for every African work gang there was a white "overseer". Thus when African miners were killed or injured so usually was the white miner.

Simons suggests that any decrease in the accident mortality rate must "be attributed to improved first aid and medical treatment rather than to preventative measures".[25] Furthermore, he argues that

> an accident is not a fortuitous unavoidable event. It is broadly, the result of defective adaptation to or control of environment, and could have been averted by the adoption of adequate care or technical and material safeguards.[26]

In other words, the fact that the injury rate increased suggests that preventative measures were not what they should have been. A further reason, according to the GME, was that by the latter half of the 1920s white miners were having to supervise far more African miners than before. Had the African miners been trained in accident prevention this change in the ratio would not have mattered.[27] This becomes even clearer when one examines how the Government Mining Engineer (GME) perceived the accidents.

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[25]Simons, "Death" 41.

[26]Simons, "Death" 41.

[27]Duncan 10.

Causes	1912	1922	1932	1939
1.Danger Inherent to work - Misadventure	71.1%	92.8%	95.5%	96.9%
2.Defective Plant/Material	1.9%	0.4%	0.3%	0.3%
3.Fault of Injured Person				
Carelessness	9.7%	1.0%	0.8%	0.5%
Ignorance	1.9%	1.0%	0.8%	0.2%
Disobedience	5.0%	1.1%	0.9%	0.7%
4.Fault of Management	0.4%	0.4%	0.1%	0.2%
5.Fault of Ganger	4.9%	1.4%	0.4%	0.6%
6.Fault of other	3.7%	1.2%	0.9%	0.4%
7.Joint fault of 3/4/5/6	1.4%	0.7%	0.3%	0.2%

Table 7 : How the GME Saw Accidents in Select Years (1912/1922/1932/1939)[28]

The above indicates that the majority of accidents were seen to be either the result of mining being a dangerous activity or the result of "misadventure".[29] In other words, no one was to blame. Furthermore accidents were more likely to be the fault of the injured person or fellow miners than the fault of management, which suggests not only that the latter was not really considered responsible at all for the accidents but also that it was not even considered responsible for preventative measures. It would also appear that it was generally accepted that as the deep level mines reached significantly greater depths, accidents had less to do with the miners or management and more and more to do with the dangerous work place.

Responsibility for the accidents

While it would be pointless to claim or prove who was responsible for the accidents it is of interest to note the way in which the GME and mine managers' perceptions of accidents varied considerably, not least because the latter had to provide compensation for any injuries that were recorded.

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[28]Information taken from the Government Mining Engineer's Annual reports for 1912, 1922, 1932 & 1939.

[29]Misadventure - bad luck, mishap, Collins Pocket English Dictionary, 1981.

All accidents had to be reported to the Inspector for Mines in the area where they had occurred. The inspector would investigate the accident and then, depending on its seriousness, would lay charges against individual miners or the manager or whomever the inspector felt was guilty of having caused it. While most of the inquiries were dealt with by the inspectors themselves, quite a number did go before the local magistrate.

	Total No.	Cases before		Convictions	
Year	of Cases	Magistrate	Inspectors	Magistrate	Inspectors
				%	%
1911	591	170	421	57.01	95.49
1912	814	135	679	59.26	93.37
1913	2273	165	2108	67.88	96.58
1914	1975	120	1855	69.17	96.39
1915	2124	75	2049	80.00	95.75
1916	4088	105	3983	78.09	96.26
1917	2570	89	2481	59.55	96.57
1918	1836	74	1762	68.92	96.71
1919	1005	82	923	68.29	95.34
1920	1066	80	986	62.50	95.64
1921	1461	88	1373	65.91	95.70
1922	803	53	750	77.36	96.40
1923	1278	118	1160	71.19	95.43
1924	967	86	881	69.77	96.48
1925	1026	124	902	57.26	94.34
1926	1579	103	1476	73.79	92.55
1927	1802	140	1662	70.00	93.92
1928	1447	110	1337	70.91	94.84
1929	1243	81	1162	72.84	89.67
1930	1638	88	1550	62.50	93.42
1931	1261	82	1179	74.39	93.55
1932	1636	76	1560	71.05	92.18
1933	2018	88	1930	78.41	93.78
1934	1873	244	1639	82.38	93.90
1935	1665	352	1313	82.10	94.06
1936	1524	346	1178	78.61	93.04
1937	1867	374	1493	76.74	92.43
1938	1705	263	1442	79.85	91.47
1939	1964	308	1656	81.82	92.27

Table 8: Success Rate of GME Cases in Inspectors' Courts and Magistrates' Courts[30]

As the above shows, the State had a far greater success rate achieving prosecutions in the inspectors' courts than it had in the magistrates' courts, probably because the former were serviced by the Mining Engineer's department, and consequently a conviction was much more likely.

Cases brought by the GME would regularly fail in the magistrates' courts on "legal technicalities...faulty

[30]Information taken from the Government Mining Engineer's Annual Reports for the years 1911 to 1939.

indictments and failure to serve summons...and disappearance of witnesses". Not least of the problems was the time it took for cases to come before the courts: witnesses had often finished their contracts and left the mines.[31]

It is very difficult to ascertain from the trial records what the precedents were for convictions and sentence. The following examples will suggest that in most cases guilty miners were fined or, in the case of many white miners, had their licences cancelled. Few were sentenced to prison. Attempts to prove culpable homicide against white miners were invariably quashed. Indeed it would seem that during this whole period not one white miner was found guilty of culpable homicide in relation to mining accidents.

Just how arbitrary sentences could be is illuminated by the following. An engine-driver who had "failed to test the brakes of his engine" and then lowered a cage using "an unclutched drum" which ultimately led to the death of one white miner and two African miners, and the injury of a second white miner, was fined £10. In another case the manager of a mine was fined £20 or one month "for failing to provide a constant supply of water for allaying dust in stope". On a different mine a manager was fined £100 for rendering false statistical returns.[32] Unfortunately the GME did not elaborate on any of the cases, so it is unclear what the issue of the statistical returns was about. It would appear that the returns were of a technical nature, probably pertaining to the administration of the mines. Nevertheless, a driver could be fined £10 for killing three people, whilst a manager could be fined £100 for providing incorrect data on the working of the mine. Profit, in this case, seemed more important than loss of life.

The withdrawal of a white miner's licence by the GME effectively put him out of work. It was no doubt this threat that played a significant part in reducing the number of accidents from explosives during the period under discussion. In one case a miner without a certificate was fined £25 or two months when he blasted a round of explosives. Luckily no one was injured. The guilty miner had used

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[31]UG40-1913 129-131.

[32]UG40-1913 129-131.

a duplicate of his brother's certificate.[33] A similar fine of £25 was imposed when a mine overseer and two other white miners were held responsible for the death of five African miners. They had forced the African miners to work in a stope which was full of smoke and fumes. The mine overseer was fined £25 or one month, the other two were fined £20 or one month and £15 or six weeks respectively.[34]

During the early 1920s the GME noted that there was a falling off in the number of cases coming to both the magistrates' and the inspectors' courts and concluded that mine managers were reluctant to report accidents "for fear of becoming unpopular with the miners and having to face industrial trouble. This is becoming a menace to discipline underground and the labour unions should discourage the tendency as being anti socialistic".[35] Hence it was becoming increasingly difficult to lay charges, let alone get convictions. Nevertheless, as will be discussed below, there was improved control in the workplace. The Safety First Campaigns undoubtedly improved matters. Furthermore the disruptive early 1920s, and resultant scarcity of work, also would have decreased the number of accidents. Finally, as a result of the 1922 strike, white miners were reluctant to assist the authorities in cases.

Compensation

When accidents were recorded, the law required that the mining companies had to pay compensation either to the miner or, if he had died, to his family. The table below not only illustrates that accidents were costing the mines ever-increasing amounts because of the claims being made by both African and white workers, but also reveals the vast discrepancy between the compensation awarded to Africans and whites.

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[33]The Annual Report of Government Mining Engineer, UG37-1916 53.

[34]The Annual Report of Government Mining Engineer, UG40-1917 53-54.

[35]The Annual Report of Government Mining Engineer, UG50-1920 51-52.

Year	Deaths				Injuries			
	Number Compensated		Total Amounts Paid to		Number Compensated		Total Amounts Paid to	
	African	White	African £	White £	African	White	African £	White £
1911	764	86	7585	41355	477	2810	2633	84463
1912	415	50	4106	21284	680	2620	6903	85103
1913	341	54	3415	28469	975	2457	11730	93415
1914	460	58	4650	24087	688	2174	8744	73280
1915	491	69	10601	26601	814	2108	9859	63609
1916	559	54	16817	24757	971	2079	11931	59097
1917	438	67	14032	39076	1076	2188	11549	60994
1918	474	43	14835	18872	1160	2233	11312	67325
1919	437	47	13940	27511	1336	2266	10986	64092
1920	413	27	12966	13720	1655	2148	14453	72549
1921	378	33	11635	17113	1949	2059	16721	74723
1922	312	34	9340	17258	1527	1330	13035	47103
1923	448	28	13990	14137	1894	1937	14427	59000
1924	456	28	14100	16732	1969	1994	14657	61981
1925	474	30	15071	15900	2237	2132	15867	60148
1926	428	32	13489	16901	2326	2203	14703	70939
1927	515	44	15925	24363	2584	2496	16722	76339
1928	443	29	13866	15490	2872	3023	18402	87921
1929	487	46	15234	40496	3156	3278	18815	90947
1930	508	30	16015	17383	3409	3166	19402	96009
1931	491	38	16200	21537	3932	3682	20879	87520
1932	515	31	16542	19535	4501	3385	24719	86440
1933	491	52	16636	30798	4475	3444	22206	88566
1934	513	43	17647	25471	5448	3772	26273	98813
1935	503	43	17971	29167	5664	4356	27695	110300
1936	601	37	25691	19757	6038	5201	38600	133657
1937	662	54	27041	27178	7409	5571	43342	140344
1938	578	38	23529	16596	7342	6051	40660	136582

Table 9: Compensation for Deaths and Injuries to African and White Miners on the Transvaal Gold Mines, 1911-1939[36]

The fact that African miners were awarded such relatively small amounts of compensation should not of course come as any surprise given the large discrepancy in wages. Furthermore, because of the migratory nature of the labour, injured African miners often returned home without any compensation.[37] A further problem with compensation was that the NAD was simultaneously the body that was administering what African miners thought of as unjust laws and responsible for compensation

[36]Information taken from the Government Mining Engineers' Annual reports for the years 1911 to 1939.

[37]Note that in the case of African miners there were more deaths and injuries, than there were African miners receiving compensation. In other words there must have been African miners who did not receive compensation.

claims. Thus, African miners found that when they filled in compensation forms they were also required to fill in their poll tax receipt number, as "without this they would be declared delinquent and receive no compensation".[38] Another significant point is that it was only after the 1922 strikes that more African than white miners began claiming compensation. A major reason for the relatively low number of claims versus high number of injuries among African miners was that if miners were seriously injured and thus warranted compensation, they were usually unable to work and were thus sent home. Once sent home it was extremely difficult to make a claim.[39]

It was in 1903 that Sir Godfrey Lagden persuaded the Chamber to provide some compensation to African miners. The Chamber, through the Rand Mutual Assurance Company, agreed to award £35 provisionally for death or permanent disability. But the following year when the 1904 Native Labour Ordinance was passed the mines proposed to pay only £10 for death and total disability, while £5 would be paid for the loss of one eye, one hand or one foot. Tropical miners received half this amount. The 1911 Native Labour Regulations Act increased the amounts; African miners could receive from £1 to £20 for permanent loss of trade if they could still find other employment. The amount for permanent disability or death varied between £35 and £50. £50 was equivalent to about 13 months' average earnings.[40] This compensation scale remained in place until the Second World War.

Occasionally African miners had recourse to the law. In one case a miner was injured in an accident on the ERPM and had to have a leg amputated. The surgeon performed the operation against the expressed wishes of the injured man, who took legal advice and sought £500 worth of damages from the doctor. The ERPM management became involved and settled the case out of court by offering the miner an

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[38]Budlender, D., "Workmens Compensation," South African Labour Bulletin 9 (February 1984) 34. Evidently part of the compensation amount was deducted and given to the relevant authorities.

[39]According to Leger, ("Floods of Blood" n.d.) this problem still exists to this day.

[40]Simons, "Death" 50-51. In comparison, white miners received 50 per cent of wage plus wage for a stipulated period if partially disabled. If permanently disabled the white miner received up to three years wages plus either a wage or £750. If the miner was killed his widow received two years wages. After the 1913 white miners strike the amounts appear to have decreased slightly. Permanent disability only received, in total, £125.4, whilst death only resulted in the widow receiving a single payment of £83.6 (Budlender 22-41). The implications of this are beyond the scope of this thesis but need to be explored elsewhere.

undisclosed amount of money.[41]

The low level of compensation was no doubt in the back of the mind of the Inspector of Mines for Boksburg when he remarked that "the death of a Native is not looked upon by miners here as a very serious affair".[42] This degree of callousness may have been uncommon, but mining officials undeniably approached accidents with both a sense of inevitability and a strong paternalism. African miners were not seen to be capable of looking after themselves, something the GME pointed out when reviewing accident statistics:

> It will be noted that surface death rate remains constant (1903-1913) and that the [African] rate is approximately double that of the white rate. This indicates to some extent the relative capacity of the two races in looking after their personal safety, for on the surface works of mines that safety of the individual is very largely dependent on his own care, knowledge and judgement.[43]

The GME was contradicting himself, as he had also argued that the majority of accidents occurred as the result of misadventure and not as the responsibility of any miners, African or white.

A further reason would have been the racist view that Africans were cheap and easily replaced, especially when one considers that the mining industry had to absorb very few costs associated with accidents.[44] Compensation was small, and disabled African miners were simply repatriated and were therefore no longer of any expense to the mines. Thus the mining industry only had to cope with the cost of production shutdowns and damage to equipment.

Prevention of Accidents

Yet there is ample evidence to suggest that the GME understood why the accident rates were relatively high but seemed unable to force mining companies to carry out his advice. In 1913 the GME discussed

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[41]TA, K358, evidence of the ERPM's compound manager, J.S. Norwich, to the NGC, 13 March 1914.

[42]The Annual Report of Government Mining Engineer, UG49-1912 111.

[43]UG40-1913 112.

[44]The Rand Daily Mail ran a story under the banner headline "The Life of the Mine Native," in which it stated that "the Kaffir is cheap. It only costs £10 to kill him and £30 to £50 to deprive him permanently of all earning powers" (7 July 1914).

the high accident rate in his annual report. Twenty years later the points he raised were still valid. Firstly, he claimed that silicosis had either killed off all the good white miners or frightened them away. Thus the white overseers that were on the mines in the period under discussion were inexperienced and consequently unsatisfactory. At the same time poor ventilation and the ever-increasing underground distances that miners had to walk to get to their site of work had increased carelessness on the mines. Secondly, the GME referred to a phenomenon known as "speeding up", whereby management attempted to increase productivity by getting the workforce to work faster. This led to workers feeling pressurised and rushed and thus to safety measures being skimped. The GME concluded:

> If speeding up and rushing mining work to extremes is responsible for accidents, the responsibility rests principally with the controllers of the mine who determine the output on a scale which is frequently in excess of the labour complement available and of the capacity of the mine and its shafts, and who have now to live up to promises made to shareholders.[45]

Thirdly, he noted that the reduction in working costs to maximise profits also had an effect on the accident rate. According to the GME the most noticeable areas where savings were being made were on "Timbering and waste packing". Packing involved using loose rock to form a support wall, which was unpopular as it took considerable amounts of time if it was to be effective. Timbering, which was essential for maintaining an open stope, also had to be carried out after blasting. When blasting, temporary supports were erected which were knocked out by the explosion. Miners often did not erect them again afterwards as this was also time-consuming.[46]

The GME noted later how poor accident prevention at the beginning of many mines' history was having a disastrous effect as

> Mine managements are reaping the benefit (sic) of past bad work: large sums are being spent upon shafts and main travelling ways that have been robbed of adequate support years ago, and the huge areas of unsupported stoped out ground are causing an expenditure which, when sufficient attention is paid to the safety of the workers, has a very serious effect on mining cost.[47]

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[45]UG40-1913 112.

[46]UG40-1913 112.

[47]The Annual Report of Government Mining Engineer, UG37-1918 46.

What the GME did not discuss was the mining companies' apparent failure to implement the recommendations he was continually making. Cost factors certainly played an important role in reducing the amounts spent on accident prevention, especially in the periods of "marginal profitability" discussed in the first chapter, namely the Reconstruction period, post World War One, and the early 1930s. What must also have had an effect was the predominant feeling amongst mining officials that accidents were simply inevitable. If by 1939 over 95 per cent of accidents were being classified as the result of dangerous workings or bad luck, it is not difficult to understand why mining officials felt there was little room for improvement. There was a complacency amongst officials, confirmed by the fact that for decades after the period under discussion the death rate from accidents did not improve significantly.

The Safety First Committee

What also needs to be examined is the role of the Safety First Committee, firstly, in increasing the awareness of accident prevention, and secondly, in removing the responsibility for mining accidents from the hands of the officials. In 1916 the insurance company responsible for insuring miners inaugurated a scheme to reward mines that had low accident rates. That company, Rand Mutual Assurance, had previously set up a Safety First Committee which "was extremely active in diversifying safety measures...and generally in stimulating interest on behalf of safety".[48] The nature of the scheme now set up was firstly to choose annually the mine that had the lowest death rate amongst employees underground and, secondly, to choose the mine that had shown the greatest improvement in decreasing the death rate over a three-year period.[49] But both the competition and the Safety First Committee operated in a context of considerable controversy. Ferguson, who by 1923 was Inspector of Mines for Krugersdorp, was very critical of the Committee for remaining so centralised and failing to form branches either locally or on individual mines. He argued that for the whole Safety First Scheme

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[48]The Annual Report of Government Mining Engineer, UG23-1915 40. Cartwright records that from 1913 onwards the Red Cross had helped train white miners in First Aid techniques. Later they were also to help set up training for African miners. The Chamber of Mines had established a Prevention of Accidents Committee by 1913. Initially it too was only concerned with the training of white miners (Cartwright, Doctors on the Mines 97-99).

[49]The Annual Report of Government Mining Engineer, UG31-1922.

to work managers needed to work in conjunction with the miners: "since it is the workmen themselves who are ultimately responsible for the prevention of accidents, it seems only reasonable that they should be included in any schemes for dealing with the matter systematically".[50] However, he qualified this point a few years later when he said that "an item in connection with the prevention of accidents which is often lost sight of and which will bear constant repetition, is that the security of the workman depends first and chiefly on the quality of the management".[51] But by the late 1920s the Safety First scheme was also judging African miners' first aid teams in competition with one another.

Lankton, in his work on the copper district of Lake Superior, has noticed that "Safety First quickly came to wear a punitive rather then a protective demeanour. It arrived when men already felt they were watched and pressed too hard in the name of efficiency and productivity. Instead of alleviating conflict between labour and management, Safety First became another source of irritation".[52] Similarly, in South Africa, African miners resented, after a gruelling day at work, having to attend first aid classes in the evening.[53] Nevertheless, there was some incentive to attend as miners who obtained a First Aid certificate were given a "monetary bonus".[54] But despite some resistance to Safety First measures, there is no doubt that a further contributing factor to the decrease of deaths from mining accidents was the implementation of a new clause to the Mines and Works Act in the 1920s. This clause stipulated that "Every mining official on any mine employing not less than 500 persons is required to be in possession of an ambulance certificate". Furthermore, on many mines mine management required the boss boys to hold ambulance certificates. Emergency stations were located at "suitable places underground". The plan was therefore that "any person sustaining an injury should be treated by capable first aid without delay and should then be immediately sent out of the mine to receive skilled

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[50]The Annual Report of Government Mining Engineer, UG37-1923 44-45.

[51]The Annual Report of Government Mining Engineer, UG30-1927 65.

[52]Lankton, L.D., "The Causes and Social Consequences of Underground Fatalities in The Lake Superior Copper District, 1860-1915," paper presented at the International Mining History Congress, Bochum, 3-7 September, 1989.

[53]Watermeyer et al. 714.

[54]Watermeyer et al. 714.

medical attention which awaited him on the surface".[55] Unfortunately the plan did not always work so smoothly. In one case

> a Native was injured by a fall of rock about 9.00am, his leg being badly broken and great loss of blood occurr[ed]. He reached the mine hospital about 11.00am. No attempt to get a doctor was made until 1.45pm, after the hospital superintendent had dressed the injury. A note was then sent to the mine medical officer (there being no telephone at the hospital) to which he replied that he could not come until 5.00pm, as he could not get an anaesthetist. The patient died of shock and haemorrhage at 4.50pm.[56]

Unfortunately for injured miners it was not unheard of for a miner to be rescued and stabilized only to die later from septicaemia or tetanus. For example in the Johannesburg district, in 1921, 13 per cent of accident deaths were due to either septicaemia or tetanus.[57]

The GME, while recognising the role of the Safety First Committee, was of the opinion that mine management played the crucial role in mine safety. He stressed that

> due credit must also be given to shift bosses for the part they have played in the reduction of accidents...there is little doubt that the improvement is largely due to the increased attention and energy....A shift boss's activities in this direction are governed to a large extent by the attitude of his manager; if the latter is a careful administrator and a disciplinarian, the shift boss is encouraged to be thorough....This again brings up the point so often repeated in these pages, that the accident rate of a mine is governed by the personality of the manager...miners look naturally and perhaps unconsciously for example to the manager, the mine overseer and the shift boss. If they are reckless, the spirit of recklessness will prevail in the mine. If they are careful and vigilant, caution and vigilance will be inculcated.[58]

Fifteen years later the GME was to note that "almost everything is being done that can be done to reduce the accidents to a minimum, and any further possible reduction will lie largely in the hands of the

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[55]The Annual Report of Government Mining Engineer, UG21-1930 53.

[56]UG37-1914 30.

[57]The Annual Report of Government Mining Engineer, UG40-1921 16. Septicaemia and tetanus were infections caused by bacteria finding their way into the wounds. Had the hospitals been aseptic, death from these infections could have been avoided. A major reason for the military style inspections that miners underwent after each shift was to examine the miners for any cuts, abrasions or any type of injury as "the carefree and ignorant native does not know that a slight wound may be the origin of very serious trouble" (Orenstein, Notes on Elementary Hygiene 41). Had the miners been properly fed and had adequate access to cleaning facilities it is unlikely that wounds would have become septic so easily.

[58]The Annual Report of Government Mining Engineer, UG23-1915 40.

individual managers and their staffs".[59] On the issue of the role of mine managers in the prevention of accidents, the GME noted with concern that at accident inquiries the relevant mine would often send a junior official to represent the mine. The GME concluded that this usually indicated that that particular mine did not see mine accidents as very important.

Crush, Jeeves and Yudelman argue that the root of the problem of accident prevention lay with the 1911 Mines and Works Act. Not only did it prevent the training in safety measures of African miners, but it also stipulated that white gangers would be rewarded for maximum production. It was therefore in the gangers' "direct financial interest to minimize or eliminate the periods when production halted for safety reasons".[60] Furthermore, they argue that the person who really knew whether the workplace was safe or not was the "boss boy" as "he always worked with his men at or near the stope face but lacked the authority to order the workers out when he perceived a safety hazard".[61]

Simons is also sceptical of the role of mine management in decreasing the accident mortality rate. He concludes that the decrease in deaths from accidents had more to do with improved first aid and medical treatment than with preventative measures. He argues further that not only did "deficiencies in management" contribute to the high incident of accidents but that as the mines reached greater depths the mining environment changed. The temperature increased, as well as the humidity, while ventilation decreased, thus causing miners to tire more easily. He also makes the important point that "these consequences are not inevitable. The fault lies in the failure to ensure that the quality of safety work keeps pace with the degree of risk involved".[62]

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[59]The Annual Report of Government Mining Engineer, UG21-1930 51.

[60]Crush et al. 99.

[61]Crush et al. 99-100.

[62]Simons, "Death" 41-42.

African Miners' Response

The tragedy of the mining accidents is that in many cases they could have been prevented. Information about accident prevention was often available "on site" in the shape of an experienced African miner. But the relationship between African and white miners, as a result of both the colour bar and racism, ensured that the African miner did not pass this information on to the white overseer. According to Moodie

> miners are constantly reminded of the dangers in which they work by the very cramped and confined conditions in which they operate, by frequent accidents or near-accidents (rockfalls), and by the tales of old timers combined with strong management emphasis on safety. They cope with their fear by close co-operation with one another, by superstition and a certain fatalism, and by exercising constant care when on the job.[63]

The following examples taken from evidence given in magistrates' courts illustrate how white miners ignored the information African miners passed on to them:

1. In this case one white miner was injured, one African miner killed and two others injured. The following is the evidence that a witness gave in the subsequent inquiry:

> I am a machine boy of the boss who was hurt yesterday. I saw holes in the face that required plugs where we worked yesterday. The boss did not plug these holes with wooden plugs or any sort of plugs. The hole I pointed out to you went off when the Boss started to drill there. That hole was not plugged. The boss just looked at the socket, and then started to drill to the side of it. I saw the jumper going toward the socket. I said "boss that is an old hole". Fanele also said so to the boss. Then the boss said "zoeka" (get away) and swore at us. The boss drilled about two strokes when the explosion occurred, killing one boy, and injuring two others and the boss. I have seen the boss clean out holes with a scraper and tell us to go on drilling in the scraped out socket; if we refuse he does it himself. I walked back when he started to drill because the boss said zoeka. I had just sat down about 10 feet away from the face when the shot went off.[64]

2. Another accident which resulted in the death of four African miners and the injury of another three occurred as the consequence of a rockfall. The ganger had been repeatedly warned by the African miners that it was dangerous but "he drove them back with threats".[65]

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[63]Moodie, "Formal and Informal Structure" 561-562.

[64]COMA, "Report from the Health and Safety sub-committee," 29 October 1913 5-8.

[65]COMA, "Health and Safety" 5-8.

3. In another incident a surviving miner's evidence stated that

> I was hurt by stones falling in the mines yesterday. I have been working in that place about a week and a half. I knew the place was bad. I could see it was bad and I personally told the boss. The boss did not sound the place with a hammer, he told the boss-boy to pull a stone down and the boss boy said it is dangerous, it will all come, the boys must be taken away first. The boss did not do anything.[66]

Experience underground gave miners "pit sense" about what was safe and what was not.[67] Rockfalls, for example, are often "preceded by audibly and visually detectable signs". These signs include loose rocks in the roof of the stopes, "day to day changes in the rocks" and the sounds of cracking.[68] African miners would hear the "rocks talk" to them, and then they would pass the message on to the white gangers. Some did act on these signs while others, as indicated above, did not. However, according to Leger, "most of the official committees linked to the Chamber of Mines throughout the history of South African gold mining have dismissed warning signals identified by workers as misleading and unreliable".[69]

Conclusion

Simons reveals the basic problem in effective accident prevention; that "mine managements have made a substantial effort to reduce the accident and fatality rate by adopting measures within the traditional framework of the mining organisation, ie., without disturbing the relationship between white and African worker or raising the status of the African miner".[70] In other words, improvements were constrained by racial and political considerations. Therefore, despite the effort, the deficiencies within

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[66]COMA, "Health and Safety" 5-8.

[67]Miners also acquired pit sense from more experienced miners. For a detailed discussion of "pit sense" see Leger, J-P., "Learning 'pit sense': Issues in Skill Formation in a South African Gold Mine," paper presented at the Association for Sociology in South Africa's annual conference, University of Cape Town, July 1991.

[68]Kistner, U., "'Talking Rocks ': Conditions and Problems of an Emerging Literature," in Nethersole, R., (ed) Emerging Literatures (London: Peter Lang, 1990) 131-143. Much of her argument is based on Leger, J-P., "Rockfalls and Rockbursts - a preliminary survey and project proposal," n.p., n.d..

[69]Leger, as above, cited in Kistner 135.

[70]Simons, "Death" 53.

management remained. While considerable merit can be found in his argument, he does not take it far enough. The colour bar played a significant role in accidents, but so did a number of other factors. Certainly the increasing depth was significant and throughout the period under discussion mine officials attempted to solve the problems caused by the depth, albeit unsuccessfully. Paternalistic attitudes on the part of officials, which prevented them from equipping African miners with suitable training in accident prevention, was another factor. Economic factors such as cost savings, both on mining methods and increasing production, contributed to the number of accidents. On the other hand the Safety First Committee, albeit controversially, also played a role in decreasing deaths from accidents.

Perhaps the most dismaying reason for accidents was the exclusion of African miners from an active role in accident prevention. African miners who attempted to involve themselves in accident prevention were ignored, more often than not, sometimes with devastating results. Thousands of them ended up among the dead men who would tell no tales.

Conclusion

A major theme of this thesis has been the mining industry's ability to determine the pace of change. Apart from being unable to prevent the 1913 banning on recruiting Tropicals, the mining houses enforced or flouted government legislation as they pleased. Despite this defiant approach conditions both at the work place and in the compounds did improve. The high death tolls registered in the reconstruction period after the South African War became something of the past, so much so that the mining industry was able, in 1932, to finally convince the South African government to rethink the ban on Tropicals.

The mining industry had therefore successfully convinced the authorities that all was well on the mines. Furthermore, the industry was able to convince a number of government commissions in the 1940s that the migrant system must stay, to ensure the well-being of the worker. This apparent concern "with the health of its African mineworkers was a disingenuous rationalization for advocating the migrant labour system, but one calculated to gain the approval of the industry's shareholders".[1] Thus Orenstein, before the Fagan commission, argued that "if you establish a static labour force of underground Native labourers, the silicosis ratio would reach that of the Europeans and probably exceed it".[2] To which Dr George Gale, secretary for Public Health, replied that this argument was untenable as he knew

> of no evidence, statistical or otherwise, in support of this assertion. If the health and feeding services on the mines are effective, they should be effective over a long period as over a short one...European miners do not have to take long holidays in order to stave off ill-health, and there is no proof that there is any fundamental difference between the inherent physical resistant qualities of Natives and those of Europeans.[3]

The excuse that miners' health required periodic repatriation therefore worked to the economic advantage of the mines and the political advantage of the state.

Thus, despite considerable time, money and effort spent on creating a "model" health and safety system

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[1]Katz, PhD thesis 365.

[2]Quoted in the report of the Fagan Commission, UG28-1948 37.

[3]UG28-1948 40.

on the mines, the mining industry was still of the opinion that the health of their workers was best served if they were sent home. Certainly, miners on their death bed would have wanted to die at home rather than in the depersonalised ward of a mine hospital, but the fact is that a repatriated miner, or an ill miner who left of his own accord, was not included in the balance sheet. Keeping miners on the move helped substantially to improve the morbidity and mortality statistics.

The thesis has therefore argued that thousands of miners, who worked underground in gruelling and dangerous conditions, who were accommodated in unsanitary conditions, and who were nutritionally deprived, died or were disabled. However, it has also been argued that many thousands more survived their experiences on the mines and many of them renewed their contracts. Although disease mortality and morbidity rates were extremely high during the reconstruction period, significant decreases were achieved by the 1930s. Accident mortality rates had also decreased, but not the injury rate from accidents. The latter continues to be of great concern to this day.

The decrease in these rates was the result of a number of improvements. Full-time medical officers, trained medical orderlies and properly equipped hospitals all played a part. Furthermore, improved compound conditions and better food preparation also contributed to lower mortality and morbidity on the mines. Baker has argued that reforms that did occur happened for a variety of reasons. Foremost amongst these were economic considerations, which led to lack of proper planning and limited management expertise; labour shortages; relationships among state, municipalities, mining engineers and workers; scientific developments. She argues that the Spanish Influenza and the ban on Tropicals in 1913 concentrated the minds of medical men on the mines. As a result they introduced a centralized scheme of hospitals, expanded the role of the doctor on the mines, introduced a more comprehensive approach to disease research - in other words, a more professional service was in place by 1930.[4]

Another factor was the improvement in medical screening methods, whereby unfit miners were either refused work, or, if already employed, repatriated. Improved medical technology also played a crucial

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[4]2-3.

role: radiography allowed doctors to weed out miners with lung infections, whilst certain drugs gave the ill a better chance of survival. Thus while the health and safety system was not only in place but well established on the eve of World War Two, it was not yet confident enough to take on the responsibility of caring for permanent workers. Therefore the migrant system remained.

Areas where more research is necessary include, firstly, the relationship between African miners and the health system, we need to understand more about the perceptions African miners had of the medical treatments meted out to them. Secondly, we need to find out more about the medical officers who served the mine medical system. On the latter some information has already been uncovered, but the topic needs further research.[5] An important issue was that the mining industry spent vast amounts on technology and equipment but very little on food and health for African workers.

The doctors on the mines were caught up in a very complex contradiction: on the one hand, they were the employees of the mining companies and thus were acutely aware of what health expenses cost the mines; and on the other hand they realised that poor conditions and inadequately fitted hospitals cost lives. Though they rejected the idea of a centralised health system on the grounds that it would affect their independence, many wanted to see greater control placed over the mine managers by the Chamber. They felt that mine managers should undergo some form of training in sanitation and hygiene as doctors had found that

> hygiene in the companies was found to depend very much on the enthusiasm and competence of the individual compound managers, many of them are conscientious and enthusiastic about health matters, but not infrequently the compound manager appears to consider that his policing duties are much more important than sanitary supervision...A certificate in mining hygiene should be a necessary qualification for an aspirant compound manager.[6]

While never legislated, the acquiring of hygiene principles by mine managers was encouraged by all the mining groups by the end of the 1930s.

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[5]For example, Packard talks of doctors labelling patients as racially susceptible to disease and the effects of being "uncivilised". Katz concluded that "the silence of these parties [MOH & State] confirmed that they were totally unconcerned with and indifferent to a serious health problem, which concerned only members of the working class" (Katz, PhD thesis 33).

[6]MMOAA, minute dated 25 April 1929 of the Mine Medical Officers' Association.

The GME in 1902 expressed the contradiction as follows:

> While many, though not all, mine doctors are sincerely anxious to do their duty, as long as they are paid by the mining companies they dare not press their opinions where expensive alterations or improvements are required. They are simply at the mercy of their employers, and would in very many cases undoubtedly be dismissed if they made themselves unpleasant. Of course there are honourable exceptions...but [one] must be aware of cases in which medical reports have been suppressed or amended even when made by very responsible men.[7]

A further problem during the Reconstruction period was that there was a plethora of doctors in Johannesburg, partly as a result of army doctors being released from military duties and partly as a result of doctors from Europe seeking work in area with enormous population growth potential.[8] Despite such a surplus the mining industry was reluctant to incur the expense of employing full-time medical officers for the mine compounds. The passing of the 1925 Miners' Phthisis Acts Consolidation Act made it compulsory for the mines to employ full-time MOs.[9] However, a full-time MO was expected to be responsible for the health of a significant number of African miners. In 1925, for example, the average was one MO per 19 368 miners.[10]

Buckle felt that part-time MOs placed a "moral strain" on white doctors as they had to choose "between going to attend a European or a native". In most cases "the native has to wait until the white man has been attended".[11] However mine MOs rejected this suggestion on the basis that "a man who devoted the whole of his time to natives would probably deteriorate in his practice and would not be so up-to-date as if he was dealing with white people as well".[12] Mine medicine was also seen to be boring as there were fewer diseases to cure and doctors reputedly lost their "bedside manner".[13]

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[7]Cited in Moroney, Honours dissertation 55.

[8]Baker quotes Mr S. Evans as saying that "for every appointment in the Health Department of the Transvaal Government there were, not dozens, but hundreds of applicants" (84).

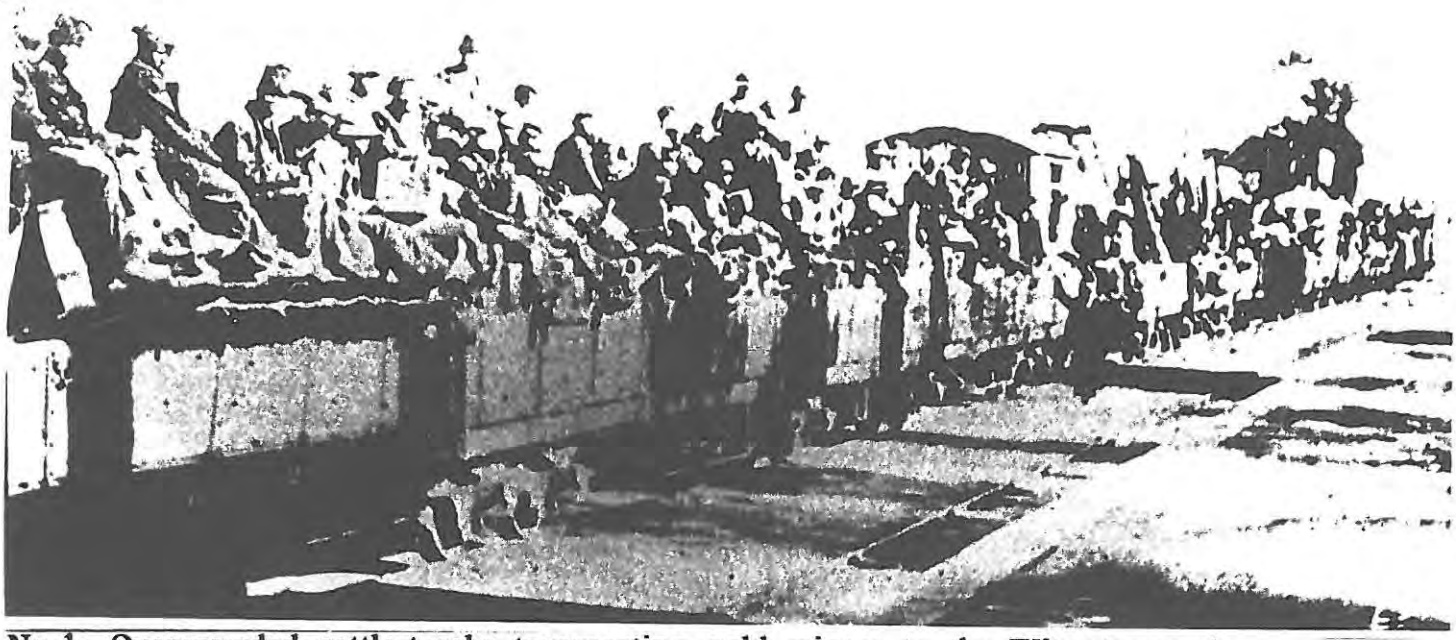
[9]Mines with very small labour complements were excluded from having a full-time MO [COMAR (1926) 60].

[10]Baker 116. In rural areas there was about one doctor per 30 000 Africans.

[11]TA, K358, evidence of the Medical Officer of Health to the Union to the NGC, 3 March 1914.

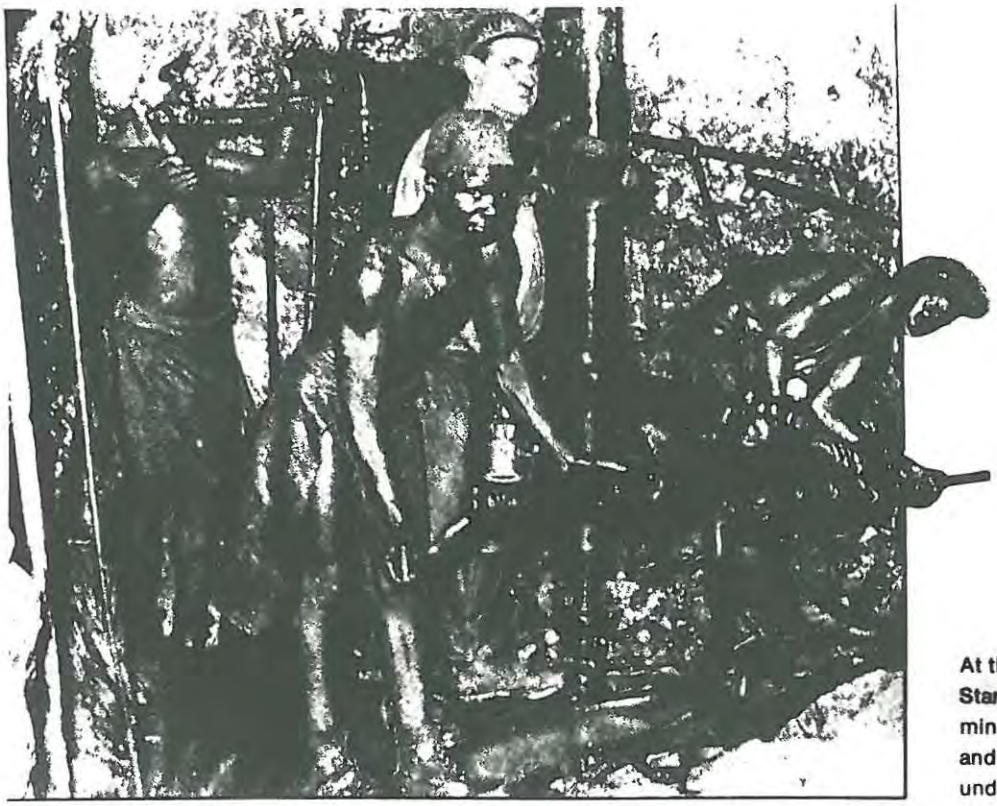
[12]TA, K358, evidence of C.W. Villiers to NGC, 3 March 1914.

[13]Villiers to NGC, March 1914.



No.1. Overcrowded cattle-trucks transporting gold miners to the Witwatersrand (Source: Callinicos, 1987, p.174).

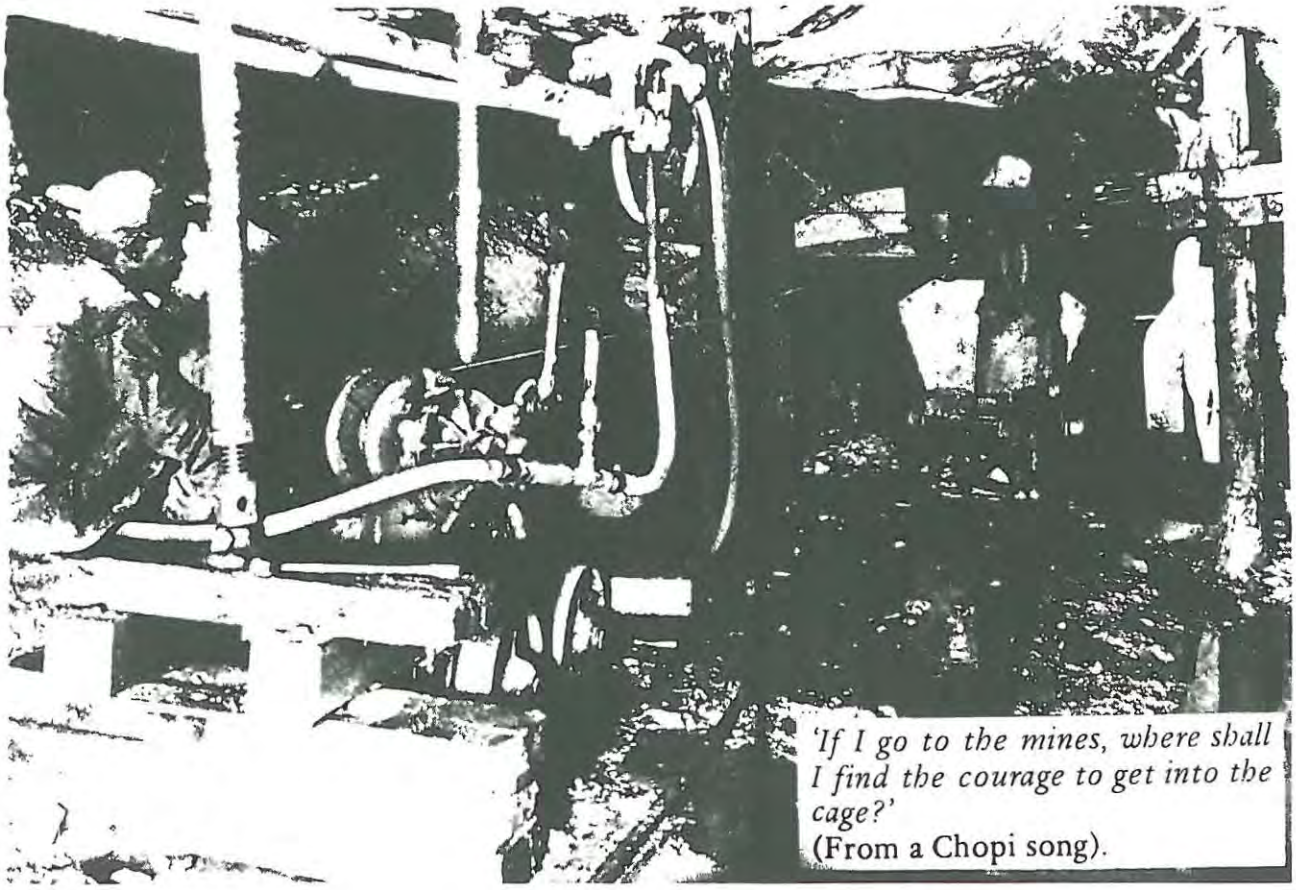
No.2. A white ganger with his "hammer boys". Some of the black miners are not wearing boots, thus exposing their feet to the sharp rocks and hookworms (Source: Callinicos, 1987, p.104).



At the rock face. Standing in water, these miners are nearly two and a half kilometres underground.

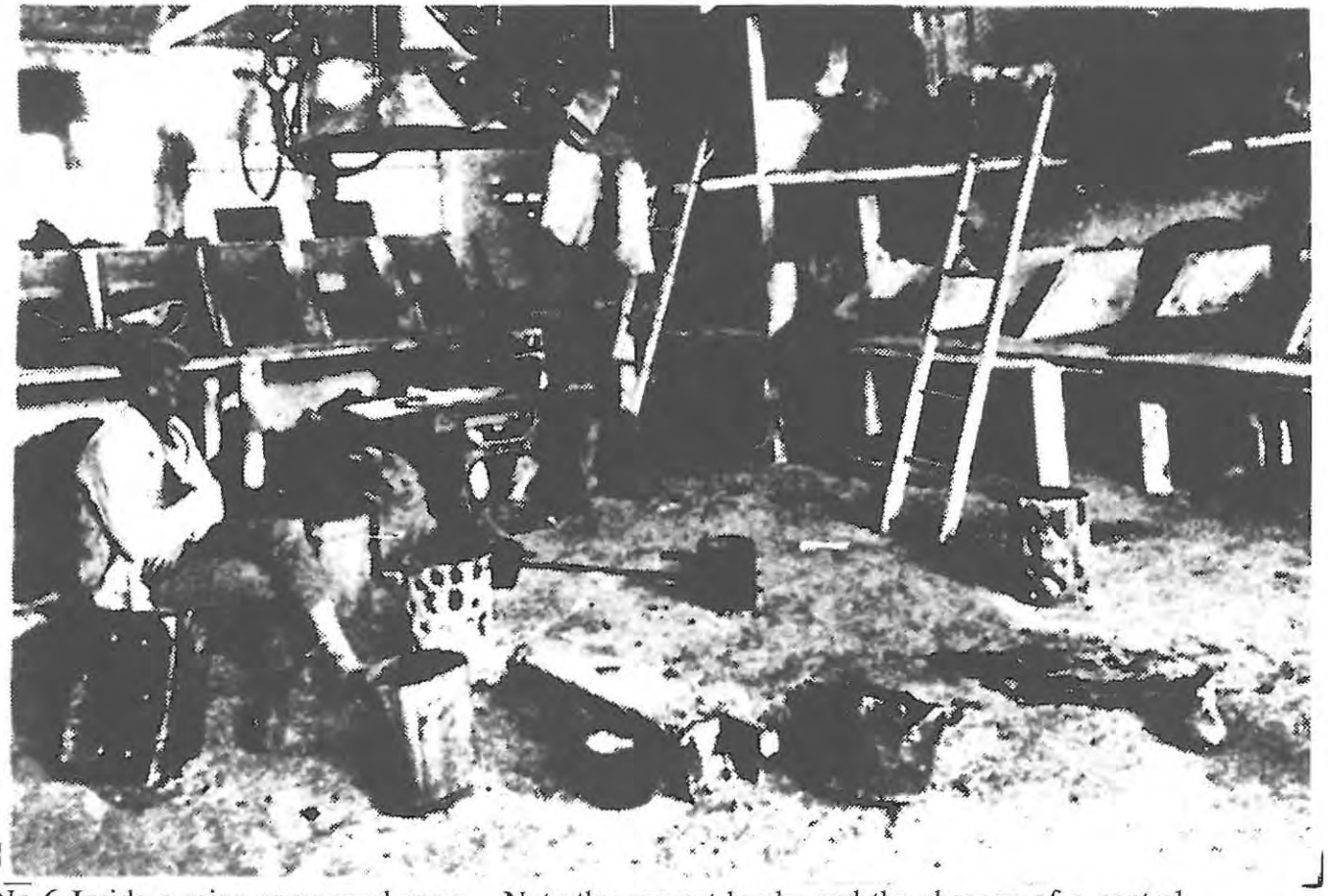
No.3. Miners setting up a rock drill. Both the black and the white miners are in close proximity to the rock face, thus making them equally susceptible to silica dust damaging their lungs (Source: Callinicos, 1987, p.102).

No.4. Black Miners, without boots, in the haulage (Source: Callinicos, 1981, p.52).



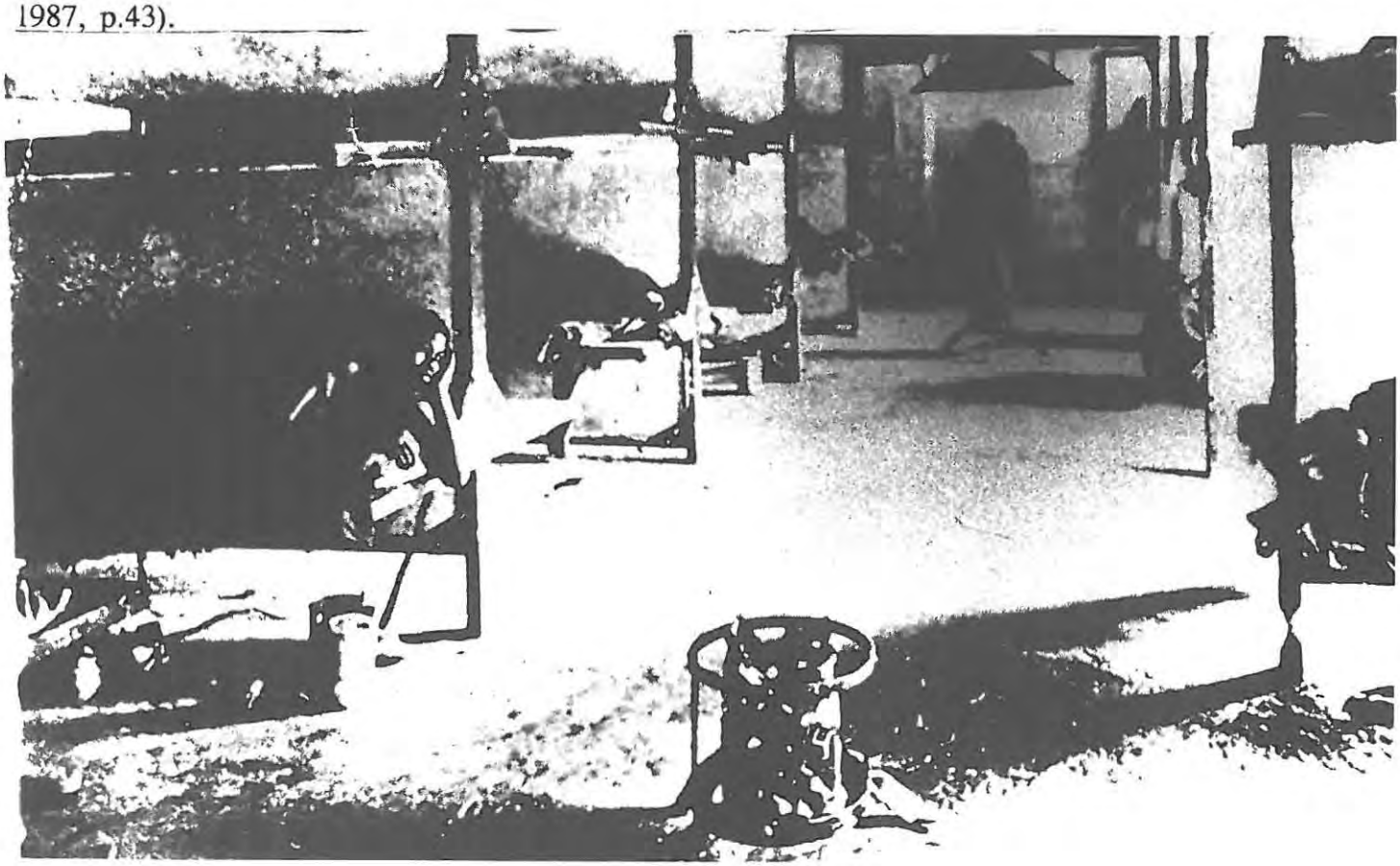
'If I go to the mines, where shall I find the courage to get into the cage?'
(From a Chopi song).

No.5. Miners on the long walk to the compound (Source: Callinicos, 1987, p.121).



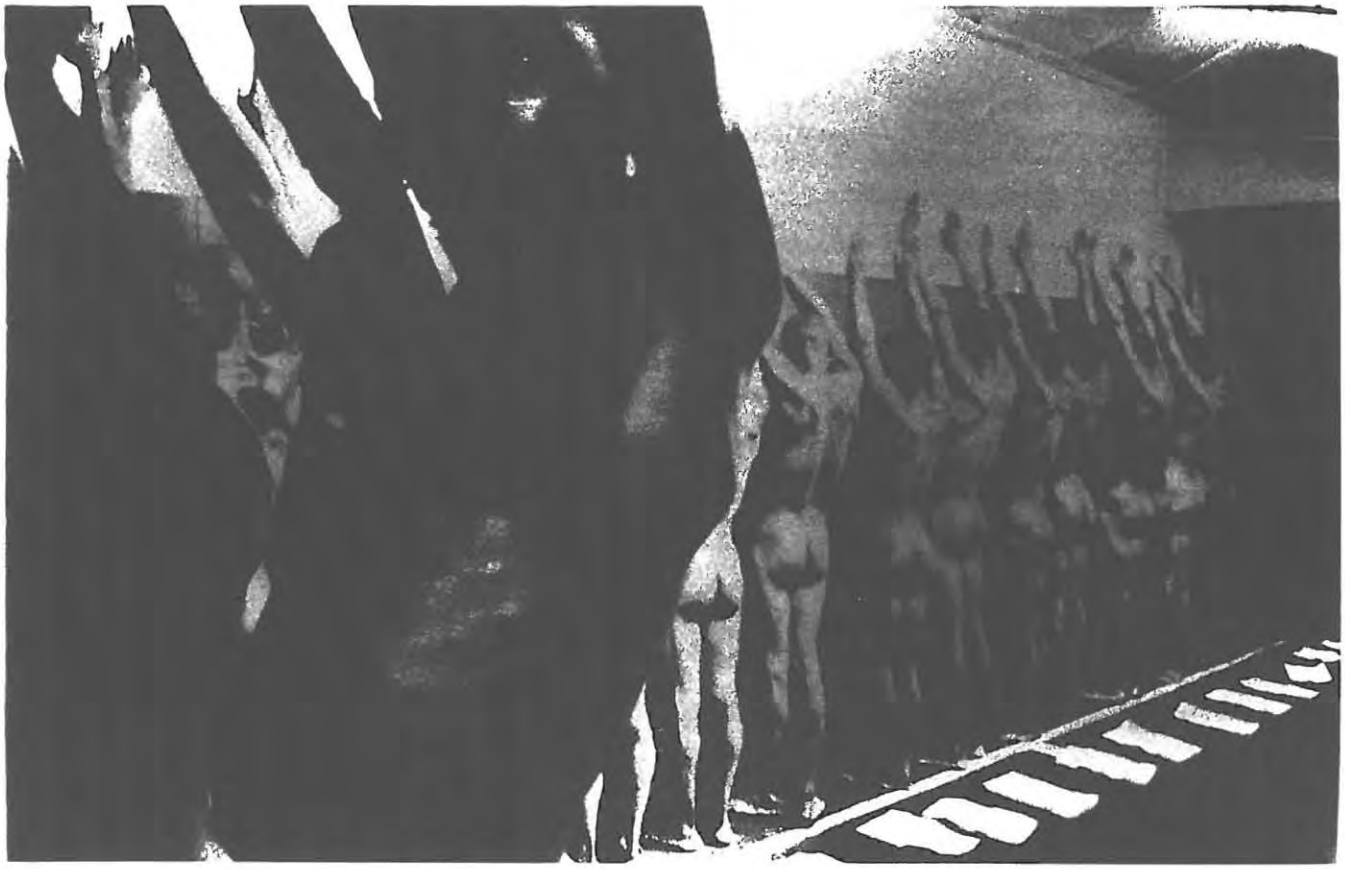
No.6 Inside a mine compound room. Note the cement bunks and the absence of a central stove. The Miner behind the sewing machine was probably supplementing his wages by making and repairing clothes (Sources: Callinicos, 1981, p.102).

No.7. A more "modern" compound room, which had separate bunks (Source: Callinicos, 1987, p.43).



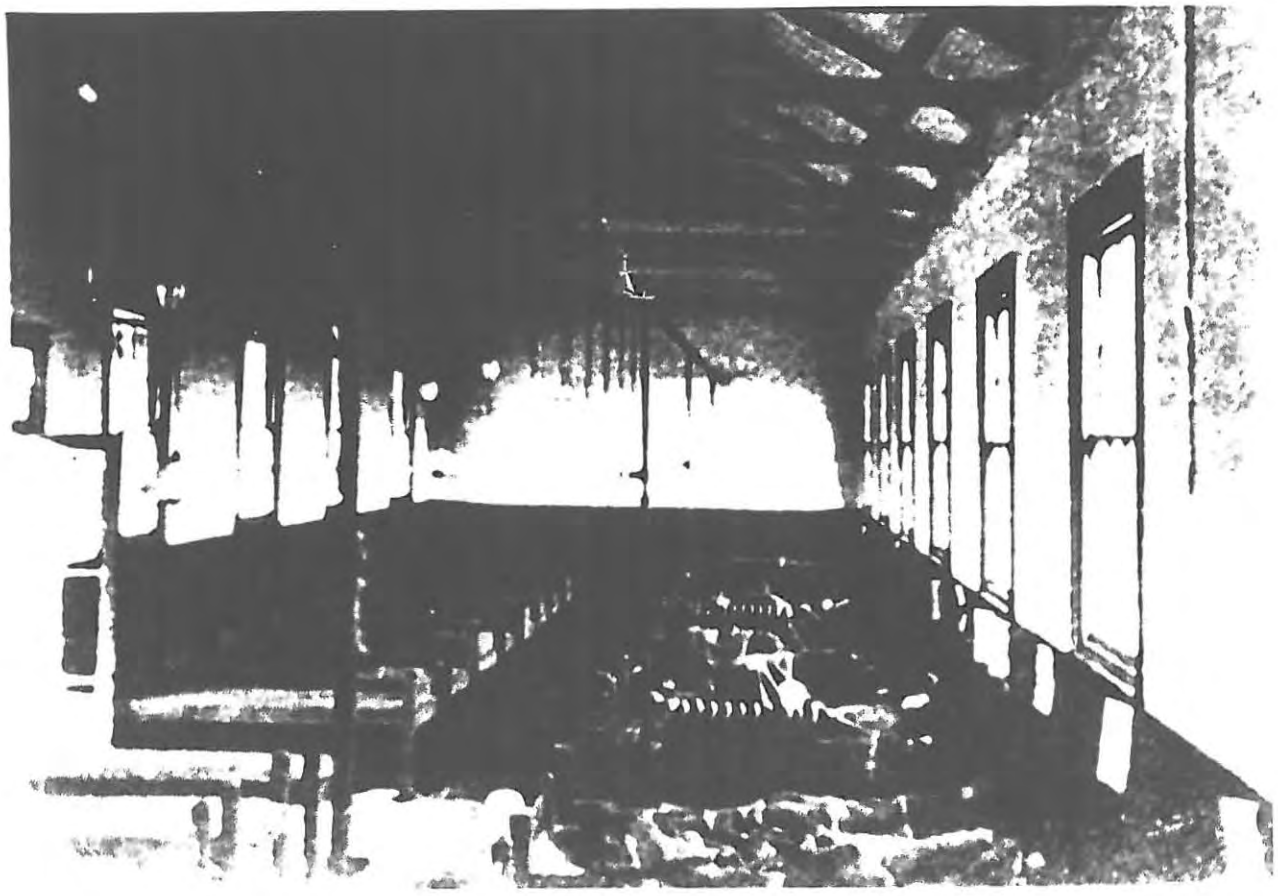
No.8. A miner fixing his boots (Source: Callinicos, 1987, p.96).

No.9. Inside a mine trade store (Source: Goldblatt, D. & Gordimer, N. On The Mines. Cape Town: Struik, 1973. no page numbers.).



No.10. A mass medical checkup (Source: Callinicos, 1981, p.44).

No.11. Inside a mine hospital (Source: Callinicos. 1981, p.49).



Source: UG39-1922 46-49

SCHEDULE "B."

Native Recruiting Corporation, Limited.

Schedule of Rates of Pay and Symbols to be used on Pay Rolls.

UNDERGROUND.

PIECE WORK—MAXIMUM RATE.

Symbol NATIVES EMPLOYED ON HAND DRILLING IN HARD ROCK :—

PROBATIONARY PERIOD.—All Natives on hammer work to be allowed a probationary period of 14 shifts, and during such probationary period to be paid not less than 1s. 6d. per shift irrespective of the amount of work done.

H. No Native employed on hand drilling shall be entitled to cease work before the expiration of the working hours of the mine unless he shall have performed the shovelling work called for in this schedule and in addition have completed 42 inches of drilling as directed. Any Native employed on hand drilling may be required to do shovelling to clear the face after the preceding blast, and in the event of such shovelling exceeding two hours such Native may be required to continue shovelling or to perform any other mine work until the completion of the shift, and in either event he shall be paid 2s. for the shift, provided that when the said Native in addition to shovelling (exceeding two hours) drills more than 36 inches in the same shift, he shall be paid at the rate set forth hereunder. Any shift during which a Native employed on hand drilling fails to do sufficient shovelling (not exceeding two hours) to clear the face after the preceding blast and in addition to drill 24 inches, shall be deemed to be an incomplete shift, and shall not count against the period of service.

HAND DRILLERS (Drilling in Hard Rock).

Shovelling not exceeding two hours and less than six inches drilled, no payment.
Shovelling not exceeding two hours and drilling of six inches and over, paid for as follows :—

H.

6 ins. to 11 ins. ..	9d.	36 ins.	2s.
12 ,, 17 ,, ..	10d.	37 ,, to 41 ins. an additional	
18 ,, 23 ,, ..	11d.	½d. per inch.	
24 ,, 35 ,, ½d. per inch.		42 ,, ...	2s. 6d.

and for every inch over and above 42 inches an additional 1d. per inch.

H. An increase of 20 per cent. in the length drilled shall be allowed in calculating payment for upper holes, *i.e.*, dry holes.

X. Boss Natives, an average of 2s. 3d. per shift.

PROVISIONAL RATE OF PAY FOR NATIVES EMPLOYED ON HAND-DRILLING WITH -INCH STEEL.

½d. per inch. In addition a bonus of 6d. on completion of two holes drilled of 30 inches each and a further bonus of 9d. on completion of each subsequent 30-inch hole drilled in any one shift.

Mines introducing ⅞-inch steel should call for volunteers for the work and pay such natives either the average rate previously earned by them with ⅞-inch steel or at the above provisional rate for ¾-in. steel, whichever may be the greater, during a trial period not to exceed three months.

M. NATIVES EMPLOYED ON MACHINE DRILLING—Day's Pay.

	Maximum Rate.
MACHINES :	
Handles	2s.
Spanners	1s. 9d. to 2s.
M.D. MACHINES : Development (if complete round is drilled during shift).	
Handles	2s. 3d.
Spanners	2s.
A. DRILL CARRIERS (Jumpers)	1s. 6d.
M. Machine Helpers (Handles)	2s.
,, ,, (Spanners)	1s. 9d.

PIECE WORK.

M.R. MACHINES (Reciprocating) feet.	24	26	28	30	32	34	36	38	40	42	48	54	60
Handles : 2/- for first 24 ft. and 1⅓d. per foot thereafter	2/-	2/2⅔	2/5⅓	2/8	2/10⅔	3/1⅓	3/4	3/6⅔	3/9⅓	4/-	4/8	5/4	6/-
Spanners : 1/9 to 2/- for first 24 ft. and 1d. per foot thereafter .. *	2/-	2/2	2/4	2/6	2/8	2/10	3/-	3/2	3/4	3/6	4/-	4/6	5/-
M.W. MACHINES (Water Fed Hammer Drills) feet.	30	32	34	36	38	40	42	44	46	48	54	60	66
Handles : 2/- for first 30 ft. and 1d. per ft. thereafter	2/-	2/2	2/4	2/6	2/8	2/10	3/-	3/2	3/4	3/6	4/-	4/6	5/-
Spanners : 1/9 to 2/- for first 30 ft. and 5-6ths of a penny per ft. thereafter*	2/-	2/1⅔	2/3⅓	2/5	2/6⅔	2/8⅓	2/10	2/11⅔	3/1⅓	3/3	3/8	4/1	4/6

*NOTE.—Spanner Boys may be paid 3d. per shift less than rates given.

STRAIGHT STOPING WITH JACK HAMMERS.

Symbol 1. Only one Native to be allowed per machine.

M.H. 2. The standard for this work to be set between 12 and 15 feet inclusive, and the minimum rate of pay for this work shall be 2s. per shift, except in the case of Natives who through their own fault fail to attain the standard, in which case the pay shall be 1s. 6d. for the shift.

Drilling above the standard to be paid for at the rate of 2d. per foot up to 6 feet above the standard set and 3d. per foot thereafter.

The following tabulation shows the rates to be paid :—

	When standard set is :			
	15 feet.	14 feet.	13 feet.	12 feet.
Under 12 feet ..	1/6	1/6	1/6	1/6
12 ..	1/6	1/6	1/6	2/-
13 ..	1/6	1/6	2/-	2/2
14 ..	1/6	2/-	2/2	2/4
15 ..	2/-	2/2	2/4	2/6
16 ..	2/2	2/4	2/6	2/8
17 ..	2/4	2/6	2/8	2/10
18 ..	2/6	2/8	2/10	3/-
19 ..	2/8	2/10	3/-	3d. per foot thereafter.
20 ..	2/10	3/-	3d. per foot thereafter.	
21 ..	3/- 3d. per foot thereafter.	3d. per foot thereafter.		

NOTE.—The above schedule of rates for Jack Hammers is not a compulsory minimum schedule, and the standard may be raised where necessary.

FOOTWALLING WITH JACK HAMMERS.

M.H. FOOTWALLING : Feet	18	20	22	24	26	28	30	32	34	36	42	48	54
2s. for first 18 ft., and 1d. per foot thereafter.	2/-	2/2	2/4	2/6	2/8	2/10	3/-	3/2	3/4	3/6	4/-	4/6	5/-

P. NATIVES EMPLOYED ON TRAMMING AND SHOVELLING PIECEWORK.

Sliding scale according to the percentage of Tramming and Shovelling Boys employed on Piece Work :—

If percentage of Natives on Piece Work is not more than :	Maximum average earnings per shift :
25 per cent.	2/9
37½ „	2/8
50 „	2/7
62½ „	2/6
75 „	2/5
87½ „	2/4
100 „	2/3

NOTE :—With regard to the rule which imposes a penalty of 4s. for each shift worked by any Native labourer in respect of which he has been paid in excess of the rate prescribed in the Schedule, it has been agreed :—

1. That in the case of Tramming and Shovelling Piecework, a Mine shall not become liable to the penalty unless the rate laid down is on an average exceeded during any two consecutive months. The onus of observing this rule to be upon the Mine.

2. That it shall be competent for any Mine becoming liable to a penalty in the terms of the preceding paragraph to submit to the Corporation complete detailed information as to the length of tram and other conditions under which the Natives engaged in tramming and shovelling on piecework are employed, and the price or prices which are being paid, together with particulars regarding the results which have been accomplished on piecework and on day's pay in that Mine. Such information, together if necessary with a report by the advisory officials of the Corporation, shall be referred to the Advisory Committee of Consulting Engineers for recommendations to the Board, who shall decide :—

   (*a*) Whether the penalty shall be imposed,

   (*b*) Whether the Company shall be required to alter its rates, or

   (*c*) Whether the Company shall be permitted to continue paying the rates.

Symbol.	Class of Work.	Ordinary Natives.	Boss Boys.
S.	Shovelling	1/6 to 2/–	2/3
T.	Tramming	2/–	2/3
T.S.	Tramming and Shovelling	2/–	2/3
A.	Sweepers	1/6	—
F.	Mine Captain	2/3	—
F.	Pumps	2/3	—
E.	Drill Distribution	2/–	2/3
E.	Haulage (Mech.)	2/– to 2/3	—
E.	Hoists, Winch Drivers and Haulage Gears	2/–	2/3
E.	Pipelayers	2/–	2/3
E.	Platelayers	2/–	2/3
E.	Rock Drill Fitters	2/– to 2/3	—
E.	Shift Boss	2/–	—
E.	Skips and Onsetters	2/– to 2/3	2/3
E.	Station	2/–	2/3
E.	Surveyor	2/–	2/3
E.	Timbering	2/–	2/3
E.	Truck Repairing	2/–	2/3
E.	Crushers	2/–	2/3
E.	Ventilation	1/6 to 2/–	—
C.	Electricians	1/9	2/–
E.	Rockwalling	2/–	2/3
C.	Samplers	1/9	2/3
C.	Sand Filling	1/9	2/3
E.	Shaft Cleaning	2/– to 2/3	2/3
E.	Cleaning Sumps	2/– to 2/3	2/3
C.	Wastepacking and Sorting	1/6 to 1/9	2/3
C.	General	1/9	2/3

SURFACE.

Class of Work.	Maximum Rates of Pay. Symbol.	Rate.	Maximum Rate for Boss Boys.
REDUCTION WORKS :			
Sorting	B.	1/8	2/3
Crushers	B.	1/8	2/3
Waste Rock Transport	B.	1/8	2/–
Ore Transport	C.	1/9	2/–
STAMP MILL :			
Cam Floor	E.	2/–	—
Bagging Concentrates	E.	2/–	—
General	B.	1/8	2/–
TUBE MILLS	B.	1/8	2/–
EXTRACTOR HOUSE :			
Zinc Lathe	E.	2/–	—
General	C.	1/8	2/–
TANKS :			
Slimes Vats	C.	1/9	2/–
General	C.	1/9	2/–
SLIMES DAM :			
Return Pump	C.	1/9	—
Filter Press	F.	2/3	—
General	C.	1/9	2/–
SAMPLES AND GENERAL	B.	1/8	—
ASSAYING AND SMELTING	E.	2/–	2/3
ENGINEERING :			
SMITHS :			
Strikers	O.	2/6	—
General	D.	1/10	—
DRILL SHARPENERS (including Underground) :			
Strikers	O.	2/6	—
Drill Heaters	D.	1/10 to 2/–	—
General	D.	1/10	—
Drill Sharpening Machine Operators	Z.	3/– to 4/6	—
Boilermakers and Truck Repairers	E.	2/–	—
Fitters	B.	1/8	2/–
Carpenters and Millwrights	B.	1/8	2/–
Electricians	B.	1/8	2/–
Riggers	E.	1/8 to 2/–	2/3
Masons	B.	1/8	2/–
Fires	E.	2/– to 2/3	—
Ashes	B.	1/8	—
Surface Gangers	B.	1/8	2/–
Platelayers	B.	1/8	2/–
Engine Room Attendants	A.	1/6	—
Boiler and Condenser Cleaners	D.	1/10	2/–
Compressors	A.	1/6	—
Plumbers	B.	1/6 to 1/8	—
Painters	B.	1/6 to 1/8	—
Greasers	B.	1/8	—
Other Classes of Surface Boys	B.	1/8	2/–
COMPOUND :			
Cooks	E.	2/–	2/6
Brewers	E.	2/-	2/6
Whitewashers	B.	1/8	2/–
Sweepers	A.	1/6	2/–
GENERAL :			
Banksmen	B.	1/8	2/–
Change House	B.	1/8	2/-
Headgear	B.	1/8	2/–
Ventilation	B.	1/8	—
Stables	C.	1/9	No fixed rates
Hospital	O.	2/6	3/–
Office and Store	E.	2/–	2/6
Other Classes of Surface Natives	B.	1/8	2/–
UNDER AGE NATIVES	U.	1/6	—

OVERTIME.

Whenever the ordinary length of shift is exceeded, the rate of pay shall be increased *pro rata* to the length of shift. This applies to shifts regularly worked and not to ordinary overtime, for which not less than 3d. and not more than the ordinary rate er hour is to be paid.

Symbols duplicated (B.B.) represent Surface Boss Boys.

CLASSES OF WORK FOR WHICH NO RATES HAVE BEEN FIXED.

Symbol	Class of Work.
N.	Sanitation.
	Filling and Discharging Tailings.
	Dumping Tailings
	Dumping Ashes.
	Dumping Waste Rock (excluding Waste Rock Transport).
	Filling Sand Tanks with Hoses.
	Special Drivers.
	Educated Natives.
	Police.

BONUS TO UNDERGROUND NATIVES WORKING MORE THAN 180 SHIFTS.

All underground natives in receipt of bonus to continue to draw that bonus.

Underground natives who have received a lump sum for a renewal of contract to continue to receive a monthly bonus of 5s. at the expiration of the term of extended contract.

As from 1st January, 1920, all underground natives who have already worked 180 shifts continuously must be granted a bonus of 5s. per month.

It is also permissible to pay the bonus *pro rata* to the shifts worked by any native who obtains his discharge prior to the completion of his current book of tickets; *e.g.* a native entitled to the bonus and drawing pay for 15 shifts should receive a bonus of 2s. 6d., and a native drawing pay for six shifts should receive a bonus of 1s. These bonuses are not to be calculated as part of wages.

Any native who, during a period of continuous service has worked 180 shifts underground is to be informed before leaving the mine that if he returns to work on the same mine within four calendar months he will be re-employed at the same rate of pay and bonus as he was receiving when he left, and if possible he will be given the same class of work.

Should a Company be unable to reinstate a native who had previously been employed on piece-work the native is to be employed on other work until he can be reinstated, and paid :—

(*a*) A minimum of 2s. per shift if his earnings during the last 60 days worked averaged 2s. or over per shift.

(*b*) Not less than his average earnings per shift reckoned over the last 60 shifts worked if these earnings amounted to less than 2s. per shift.

An underground native on discharge will be given a ticket showing his name and identity, class of work and rate of pay at the time he leaves the mine, and the date by which he must return to obtain the re-engagement benefits. This ticket will be handed in when the native returns to his mine.

If the native from some good cause, such as sickness, wishes to overstay his period of absence from the mine an extension may be granted subject to the officials of the N.R.C. satisfying themselves as to the *bona fides* of his case. This extension will not deprive the native of any of the benefits offered to him at the time of his leaving the mine.

In order to provide for the acceptance of previously employed underground natives by Mines whose percentage of complement exceeds by more than five per cent. the average percentage of complement of all members, the following procedure will be observed :—

(*a*) When the percentage of underground complement of a mine exceeds the general average percentage by five per cent., such mines will be debarred from engaging local natives for underground or surface, and further recruiting for such mines will be stopped, except in so far as it affects natives wishing to return to their old mine, and who have not absented themselves for more than four calendar months.

(*b*) All natives who have been absent from their mine for a period not exceeding four calendar months shall be allowed to return to that mine provided the percentage of underground complement of such mine does not exceed 95 per cent.

This scheme is to be made retrospective in so far as it applies to natives already discharged from the mines who return to their old mines within four calendar months of their last discharge and who worked not less than 180 shifts underground continuously during their last engagement on that mine.

Portuguese natives from Chai Chai and Inhambane will be allowed a period of absence up to 4½ months owing to the uncertainty of shipping being available for them.

BONUS AND INCREASE OF PAY TO NATIVES.

On any mine where the average rate of pay for underground natives does not exceed 2s. 3d. per shift the Manager is authorised, if he so desires, to raise the pay of underground natives to such an extent as will produce an average rate of underground pay not exceeding 2s. 3d. per shift.

Under this scheme the Manager of a mine where the average underground pay is 2s. per shift will have at his disposal a sum of money equal to 3d. per underground shift worked. Assuming the number of shifts worked monthly underground to be 60,000 the sum at the manager's disposal would be £750 per month. This amount can be distributed at the discretion of the manager over all classes of underground native labourers in whatever manner it may best suit the conditions of the particular mine.

Surface Labourers.—The average rate of pay of surface labourers may be increased to 2s. per shift. When determining this average the pay of the natives employed on unscheduled classes of labour must be excluded. Classes of labour for which no rates have been fixed are shown on page 3.

In addition to and apart from the above each mine manager has a fixed sum of money at his disposal to enable him to grant bonuses to individual natives or gangs of natives as a reward for efficiency. The sum so available is fixed as follows :—

A Mine may spend monthly a sum not exceeding the amount arrived at by taking five per cent. of its total native labour complement and translating the resulting figure into pounds sterling : *e.g.* a mine having an underground complement of 4,000 natives and a surface complement of 1,000 natives would have £250 per month at the disposal of the manager for distribution in bonuses to his efficient natives, both underground and surface.

The above scheme of increased pay and bonuses should come into force on the 15th January, 1920.

The records on the mines should be kept in such a way as to enable the Corporation's officials thoroughly to investigate the manner in which the scheme is being applied with a view to reporting periodically to the Board of Management.

GENERAL.

Local and Voluntary Natives.—It is not permissible for any Mine to pay rail fares or travelling expenses or to give any other inducement in cash or in kind to voluntary or local natives.

Natives Feeding Themselves.—In cases where it has been agreed that natives shall feed themselves, the Mines shall give to such natives in addition to their ordinary earnings an allowance of 4d. per shift, and also the loaf of bread supplied daily by the Mines to all underground natives.

Developing Mines.—Any rule which may permit mines to pay a percentage of its native labour complement in excess of Schedule rates shall apply to Developing Mines.

Shaft Sinking.—It is permissible to pay natives employed in vertical shafts in process of sinking a rate of pay exceeding the schedule rate of pay for similar natives on ordinary work by not more than 1s. per shift, and natives employed in incline shafts in process of sinking a rate of pay exceeding the schedule rate of pay for similar natives on ordinary work by not more than 6d. per shift.

Construction Work.—Natives on construction work to be paid ordinary surface rates.

Sunday Work.—Work on Sundays should be avoided as far as possible, but where necessary only schedule rates are to be paid.

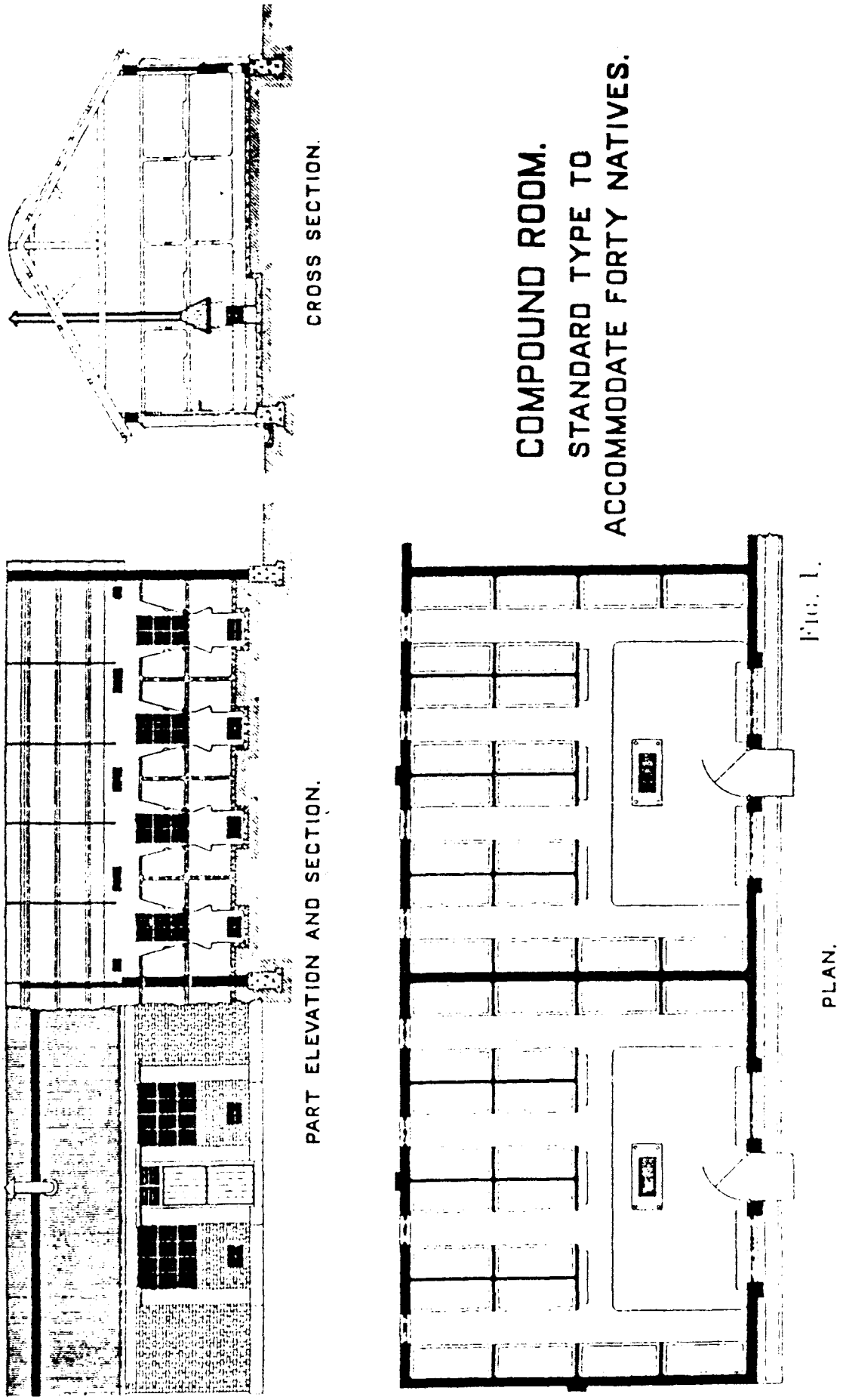
Head Natives.—It is permissible for any Mine to pay not more than three per cent. of its total underground complement up to 3s. per shift.

Pay of Coloured Labourers other than Passport Natives.—It is permissible for Mines to make their own arrangements *re* pay for such labourers.

Johannesburg,
1st February, 1920.

Appendix B

Source: *Tuberculosis in South African Natives with Special Reference to the Disease amongst the Mine Labourers on the Witwatersrand* *(Johannesburg: South African Institute for Medical Research, 1932) 67.*



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