ASPECTS OF AFRICAN HEALTH IN THE MINING INDUSTRY IN COLONIAL ZAMBIA: A CASE STUDY OF ROAN ANTELOPE MINE, 1920-1964.

BY

WALIMA T. KALUSA

A DISSERTATION SUBMITTED TO THE UNIVERSITY OF ZAMBIA IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE DEGREE OF MASTER OF ARTS (HISTORY)

THE UNIVERSITY OF ZAMBIA

LUSAKA

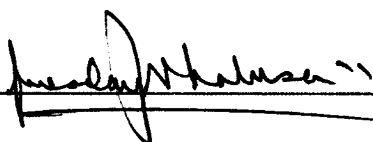
1993

DEDICATION

To my mother and father for stimulating my interest in things that happened in the past; my brothers and sisters still at school for you to emulate; and also to Zambian miners whose history I have tried to recount.

DECLARATION

I **Walima T. Kalusa** do hereby declare that this dissertation represents my own work and that it has not been previously submitted for a degree at this or any other university.

SIGNED 

DATE 07/07/94

APPROVAL

his dissertation of WALIMA T. KALUSA is approved as fulfulling
art of the requirements of the award of the degree of Master of
rts in History at the University of Zambia.

EXAMINERS

.... DATE: 29-12-93

.... DATE 7/07/94

.... DATE 7/7/94

ABSTRACT

The central theme of this study is to highlight the connection between major African health problems on the one hand and, on the other, the conditions under which African miners and their families worked and lived in the mining industry between 1920 and 1964. With specific reference to the Roan Antelope Mine, this study postulates that African ill-health was fundamentally a product of ecologically-determined diseases like malaria and of defective conditions which promoted ailments like pneumonia, dysentery, typhoid and diarrhoea especially in the formative years of the mine (1920-1938).

By the Second World War ecologically-induced diseases were brought under effective control. However, diseases linked to poor conditions on the mine persisted and this reflected the mine management´s reluctance to incur extra costs on African labour. The Second World War also acted as a catalyst in the deterioration of conditions which engendered disease turning the Roan Antelope Mine into a potential and actual disease environment. At the same time, the war precipitated the emergence of pathological diseases notably silicosis and tuberculosis.

In post-war era, the management began to improve labour conditions of the African community on the mine. Great emphasis was, however, put on the amelioration of conditions of the African middle class which emerged as a small fraction of the African population on the mine after the war. The improvement effected in the housing, wages and sanitation for this class largely shielded the middle class from diseases like pneumonia, kwashiorkor and tuberculosis. For the majority of the African population, however, conditions did not change enough to bring about marked improvements

on health. The ordinary poorly paid and inadequately fed and housed class of workers and families thus continued to be exposed to diseases from which African middle class families were largely insulated. It is in this vein that this study extends the Marxist argument on the impact of class on health to the Roan Antelope Mine.

ACKNOWLEDGEMENT

In several respects, this study is a product of invaluable assistance I received from individuals and institutions too many to enumerate. However, I wish to particularly thank Doctors Balam Nyeko and Samuel N. Chipungu who respectively supervised me in the writing up of my research proposal and dissertation. Their constructive criticisms enabled me not only to avoid some pitfalls in presentation of material, but also expand my academic horizon. I an also indebted to Doctors Fay Gadsden and A.C.S. Mushingeh for reading the manuscript of the research proposal and offering many useful suggestions.

My profound gratitude also goes to my fellow post-graduate students Bennett Siamwiza, S. Habeenzu, Sunday Ng'andu, E.K. Chiputa and Fenson Mwape for their companionship and encouragement at times when despair assailed me. To Siamwiza in particular, I say thanks for helping me in finding a suitable title for this study.

I also wish to thank workers and officials at the University of Zambia Library, National Archives of Zambia and Zambia Consolidated Copper Mines Archives in Ndola. Without their cooperation and understanding, I would not have located all the documents I required during my research.

I am also deeply indebted to my employer the Ministry of Education and the Directorate of Manpower Training and Development for awarding me a paid study leave and scholarship respectively.

My thanks furthermore extend to officials at Mukuba Pension House in Lusaka especially Mr. Max Sichula (now retired) who helped me in securing permission to consult ZCCM Archives in Ndola.

To mine officials at Luanshya Division of ZCCM, I can hardly find words with which to thank you for all the assistance you rendered throughout my stay in Luanshya. By accommodating me for two months free of charge, you greatly eased my financial burden. Similarly, by allowing me to make three underground visits, you greatly assisted me in understanding the conditions under which miners operate. In this way, I gained an insight into what underground labour conditions should have been like before Zambia attained her independence in 1964.

I also wish to record my profound thanks to my wife and our children Nsofwa, Bwalya, Chanda and Chama and my brothers and sisters all of whom have borne the burden of my prolonged absence from home; my friends Joyce Kafula Kapampa, Isaac Mumba and Patrick Mwila for the many insightful discussions we have had on a variety of topics including health problems in Zambia today; Ms Patricia Shalala for her almost flawless typing of the dissertation, and Mr. Kabole Chilindi of Luanshya who, in spite of his advanced age, allowed me to interview him for five hours during which I enormously tapped on his vast experience gained as a medical orderly at the African Mine Hospital at Luanshya between 1939 and 1972.

ABBREVIATION

A.M.W.U.	African Mine Workers Union
E.M.W.U.	European Mine Workers Union
M.A.S.A.	Mines African Staff Association
N.A.Z.	National Archives of Zambia
N.I.L.A.B.	Native Industrial Labour Bureau
N.R.C.M.	Northern Rhodesia Chamber of Mines
R.A.C.M.	Roan Antelope Copper Mines
R.S.T.	Rhodesian Selection Trust
U.N.I.P.	United National Independence Party
Z.C.C.M.	Zambia Consolidated Copper Mines

LIST OF MAPS

Map 1: Location of the Copperbelt in Zambia 11

Map 2: Location of Roan Antelope Mine on the Copperbelt . . 11

Map 3: Environment of the Roan Antelope Mine 25

Map 4: Proximity of African Compound to Plant Area 78

LIST OF TABLES

Table I: Mortality and Incidence of Pneumonia among African Miners at Roan Antelope Mine, 1930-1948 38

Table II: Expenditure on African and European Hospital Drugs, Food and Department Issues, 1934-1935 52

Table III: Estimated Cases of Assaults on Africans by Whites at Luanshya Mine, 1939-1950 82

Table IV: Fatal and Serious Accidents at the Roan Antelope Mine, 1946-1961 114

TABLE OF CONTENTS

Abstract v

Acknowledgement vii

Abbreviations ix

List of Maps x

List of Tables xi

Introduction 1

Chapter One: Ecology and Health Conditions in the Formative Years, 1920-1938 22

Chapter Two: Impact of the Second World War, 1939-1945 69

Chapter Three: Class and Health, 1946-1964 103

Chapter Four: Conclusion 130

Bibliography: 134

INTRODUCTION

For many years, the Zambian copper mining industry has been a target of much scholarly attention. The impetus to write about the industry derives from its central position in the country´s economy since 1930.[1] Disappointingly, however, little attention has been given to the health of the African labour force associated with mining. More disappointingly, even less attention has been given to examination of the health of miners´ wives and children whom, from the outset, mining companies in colonial Zambia encouraged to settle in mine compounds.[2] It is partly for this reason that this study seeks to contribute in bridging the gap in the historiography of mining.

The earliest studies on African copper miners were carried out by sociologists and anthropologists before independence.[3] Broadly, their major theme focused on traditional African institutions and how these influenced worker consciousness and behaviour. Sociologists and anthropologists sought to explain the impact of urbanisation on African culture. They were also interested in the involvement of blacks in the political and administrative structures which evolved in mining towns.[4] Generally, these studies make reference to labour conditions which had a bearing on the health of Africans, but health itself received minor attention from scholars of anthropological and sociological training. Only Professor Charles Coulter´s study of conditions on the copper mines in the early days attempts to show the inter-relationship between disease and health conditions.[5] But Coulter´s study is very brief. It also only covers the formative years of industrial mining in the country. In common with other similar studies, Coulter´s

sociological study further lacks a historical perspective and thus falls short of indicating change in disease patterns in the industry.

Another related theme in the literature on the Zambian copper industry focuses on industrial politics. Perhaps the most notable scholars in this area are Elena L. Berger and Ian Henderson.[6] On the strength of oral evidence, company and government records, these authors have separately defended the *laissez faire* attitude the colonial state adopted towards African labour conditions on the Copperbelt. To Berger and Henderson, government neglect of the conditions was not deliberate but arose out of its lack of confidence in the viability of the mining industry, its fiscal problems and its lack of manpower to regulate health conditions in mine compounds. The studies by the two authors are without doubt valuable sources of information on industrial politics involving the state, mining companies and trade unions. One serious limitation of these studies, however, lies in the fact that they only represent the official views of the mine owners and the colonial state. Little effort is made to understand African views on matters relating to labour conditions which influenced the lives of the workers and their dependants. As Charles Van Onselen has rightly argued, Berger's study is in fact devoid of the 'human dimensions'[7] and, in this way, sharply contrasts with the present study.

The third important theme in the existing literature on the copper industry, and colonial African miners in general, emanates from the colonial tradition and has persisted into recent years. Exemplified by colonial historians like Lewis Gann (with or without Peter Duignan) and medical doctors such as Michael Gelfand, this theme depicts African mine workers as beneficiaries of improved

sanitation, diet, water supply, medical care and safety measures.[8] Gann, the chief exponent of this theme, has even argued that great strides were achieved in the improvement of these health conditions due to the paternalistic attitudes of mine companies, colonial state, the Colonial Office in London and white settlers in Central Africa. To Gann, improvements in health facilities constituted a "medical revolution" in the mining industry.[9]

Colonial historians and medical authorities base their arguments on mortality figures. It is true that the death rates of miners in colonial Central Africa declined impressively. If the term "medical revolution" is meant to imply the drastic drop in the mortality of workers in the industry, Gann and other colonial historians are justified. But reliance on death statistics creates a major difficulty in interpreting miners' health in the mining industry. Figures alone cannot and do not indicate what diseases miners died of or at what age. Nor do mortality statistics show changes in disease patterns or changes in health conditions. Finally, figures do not account for chronic diseases and various material conditions or circumstances under which different social groups or classes lived and worked after they emerged within the industry. These varying conditions undoubtedly had different bearing on the classes which, for example, in the colonial Zambian context, emerged after the Second World War.

It is in part due to these limitations in the colonial interpretation of miners' health that Marxist and neo-Marxist scholars interested in the labour history of Central Africa in general and Zambia in particular have challenged the tendency to depict African mine workers as beneficiaries.[10] Van Onselen has, for instance, aptly demonstrated the close link between disease and

the policy of cost minimisation of the owners of mining capital in colonial Zimbabwe. He has convincingly shown that epidemics which claimed thousands of African workers were a result of the mine owners' labour strategy of accumulating profits by reducing labour costs. Together with Ian Phimister, Van Onselen has demystified the interpretation that the colonial state, the Colonial Office and European settlers played a very important role in bringing about improved health conditions.[11]

In a similar manner, Charles Perrings has documented the association between ill-health and labour conditions among miners in colonial Zaire. Although Perrings' study cited here covers the Zambian Copperbelt, it demonstrates no link between African miners' health and the living and working conditions there.[12]

Of more significance to this study are the works of Chipasha Luchembe and Jane L. Parpart.[13] In his attempt to underline the social and economic impact of finance capital on copper miners in Peru and Zambia, Luchembe has documented some diseases among African miners in pre-independence Zambia. Briefly, Luchembe's conclusion is that copper companies on the Copperbelt were reluctant to incur extra cost on African accommodation, sanitation, diet and other similar matters. To Luchembe, this reluctance was calculated to maximise the accumulation of surplus value.

On the other hand, Parpart has, in her endeavour to apply the relevance of class analysis to understand worker consciousness, alluded to the health of miners. Her contention is that the Rhodesian Selection Trust (RST) was compelled to improve labour conditions and medical care in order to attract experienced African employees to the Copperbelt and away from long-established labour markets in colonial Zaire, Zimbabwe, South Africa and Tanzania.

Parpart does not, however, make a detailed study of how these conditions affected the health of miners and their families.

In a broad way, this study shares the views of Parpart and Luchembe. Using the Roan Antelope Mine as a case study, the present work seeks to underpin the interrelationship between disease and living conditions which neither Parpart nor Luchembe discusses in detail. In one respect, this study deviates from the other two works, particularly in its effort to discuss not only the health of miners but also that of their children and wives. The justification for examining the health of miners' children and wives lies in the fact that the Rhodesian Selection Trust which owned the Roan Antelope Mine encouraged its employees to bring their families to the compound right from the inception of mining activity at Roan. This was done in order to promote labour stabilisation, the process then considered critical to the success of the mining enterprise.[14]

This study further differs from Parpart's and Luchembe's in that it seeks to demonstrate that within the mining industry, and at Roan Antelope in particular, emerged after the Second World War, two distinct classes of African employees. These classes, which will be identified in Chapter 3, enjoyed different rates of monetary remunerations and occupied different forms of housing. These and other varying material circumstances had varying impact on the health of the two classes with the African middle class generally enjoying better health than the ordinary lower class.

Basically, the rationale for undertaking this study is two-fold. On the one hand, the health of the African labour force and its dependent population has, as noted earlier, been neglected. The existing literature on this issue is scanty and lacks a micro-

perspective. On the other hand, this study may help in sharpening scholars' understanding of Zambian social history, an area which has not yet received its due attention from academics.

This study seeks to accomplish four interrelated objectives. Firstly, it attempts to investigate changes in disease patterns in the copper industry. The study, secondly, seeks to explain miners' and their families' health in the light of the ecology and environment of the area in which the Roan Antelope Mine stood and African reaction to conditions that engendered ill-health. Thirdly, I shall also attempt to demonstrate the inextricable relationship between ill-health and the mine management's policy of reducing the cost of housing and feeding African labour as well as its reluctance to incur extra expense on matters pertinent to sanitation, water supply and miners' wages. Finally, this study will seek to analyze the role of the Rhodesian Selection Trust and that of the colonial state in health delivery to the African community. In this regard, particular attention will be focused on the three fundamental elements of hospitalisation namely, the availability of suitable hospital buildings, medical equipment and quality and regularity of medical care or attention.

Analysis of the problems investigated here is done in the overall context of colonial political economy. Thus state intervention in and policies on matters that impinged on the health of African miners and their dependants are generally alluded to in the study.

The dissertation itself is divided into four chapters. The first of these deals with the health problems in the formative years (1920-1938) of the Roan Antelope Mine. Briefly, the chapter argues that disease patterns during this period were profoundly influenced

by the ecology and environment in which the Roan Antelope Mine stood and also by the rudimentary conditions under which African miners and their families lived. Such rudimentary conditions were reflected by poor medical services, inadequate housing and diet, insanitary conditions, unsafe water supply and other related aspects. These conditions were directly responsible for the high rate of mortality and morbidity among miners and their dependants as they promoted both air-borne and faecally-related diseases. Such conditions deteriorated during the Great Depression of the 1930s.

The second chapter, which covers the period between 1939 and 1945, concerns itself with health problems that the increase in production of copper during the Second World War engendered. The chapter basically postulates that the phenomenal expansion in production during the war gave birth to structural or pathological diseases among mine workers at Roan and elsewhere on the Copperbelt. The rise in dust level in the mine due to increased production stimulated silicosis which in turn rendered miners susceptible to infection by tuberculosis. Attempt is also made to indicate that the increase in the labour strength to meet production requirements as well as the rise in dependent population in the compounds at Roan led to increase in disease especially amongst miners' wives and children. Overcrowding, insanitary conditions, inadequate diet, and use of communal latrines and bath places persisted and largely accounted for the high rates of mortality and sickness in especially of children whose immunity was naturally lower than in adults.

The third chapter seeks to reconstruct the history of disease between 1946 and 1964. The central focus in this chapter is to relate how the varying social and material conditions of the African middle and lower classes which emerged at the Roan Antelope Mine

after the Second World War affected the health of these two classes. In brief, the chapter demonstrates that the comparatively higher wages, better housing and superior medical facilities which the middle class enjoyed enabled its members to enjoy better health than the lower class whose wages, accommodation and medical care continued to be at substandard level. A short conclusion of this study which appears at the end of chapter 3 marks the fourth and final chapter. It must be stressed that most of the diseases dealt with in this study occurred in parallel to each other. It is therefore not possible to strictly write each chapter chronologically. There is thus some amount of overlap in the presentation of material.

The data which form the core of this study derive from published and unpublished works as well as oral evidence. The data was collected in three phases between December 1991 and April 1992. The initial phase involved consultation of primary and secondary sources in the University of Zambia Library. These ranged from published to unpublished annual reports of various government departments, parliamentary debates, testimonies of African miners to and findings of various government commissions of inquiry to colonial reports. The information obtained from these documents was counter balanced by data from secondary sources which included both published and unpublished articles, books, seminar papers and dissertations stocked in the Special Collections of the University of Zambia Library.

Phase two constituted archival research at the National Archives of Zambia, Lusaka. For one month, I read through government documents at the archives. Letters between government officials and mine managers, extracts from newspapers and hansards,

annual medical reports and relevant books not found at UNZA formed the bulk of the sources consulted. These helped me in understanding government stand in matters which affected African health in the mining industry.

The third phase of the research took place on the Copperbelt. This phase involved extensive reading of mine documents at the Zambia Consolidated Copper Mines Group Archives in Ndola. I spent one month there consulting the files of the formerly Rhodesian Selection Trust and those of the defunct Chamber of Mines. A multitude of these files provided a wealth of information on company policies on labour conditions and the health of the labour force and its dependent population. Some of the files consulted contained letters between mine officials themselves or between them and the Chamber of Mines and government officials. The files also contained minutes of meetings or decisions of the management and various African groups or organisations at the Roan Antelope Mine.

While on the Copperbelt, I also gathered much oral information to supplement written evidence. As I gathered oral data, it became clear that some information lacking in written sources was actually possessed by informants. The process of oral data collection involved recorded formal interviews and unrecorded informal discussions with informants connected with mining at Roan either in the past or in the present days. Most of the interviews were conducted in Bemba and a small number of them in English. Initially, I intended to interview a large number of ex-miners who worked at Roan Antelope Mine before 1964. This, however, was not possible as most of the miners who retired or were dismissed by that date have not settled in Luanshya where most of the interviews occurred. Thus much of the oral evidence gathered emanated from

miners still in employment but all of whom were engaged before independence.

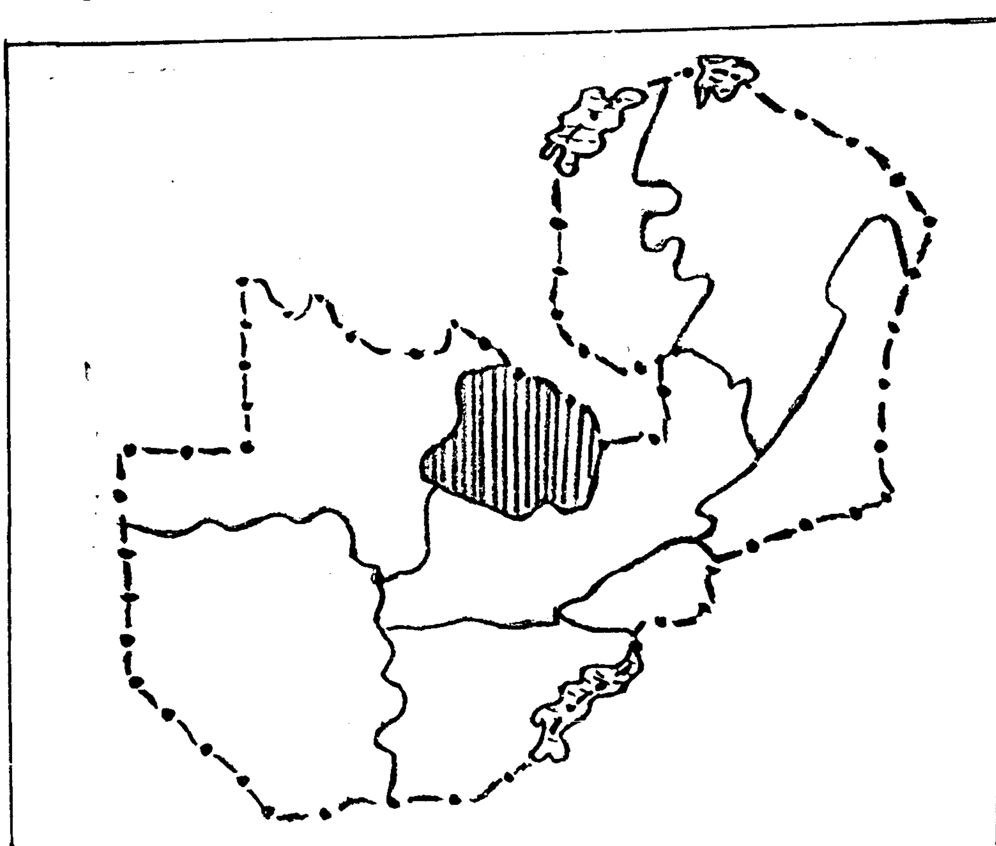
Others interviewed included ex-mine policemen, ex-medical orderlies and ex-nurses. Attempts to find and interview former mine medical officials who worked at the mine in question proved impossible as I was unable to find any. Extensive search could have led to discovery of former mine medical personnel but this was not possible because of financial and time limitations. However, as much as possible, I made an attempt to interview miners of various positions. Those in managerial or supervisory positions shed light on labour conditions which impinged on the health of employees. Data thus collected was counter-checked against information obtained from ordinary workers. I therefore feel that despite the research problems, the data I gathered are sufficient in investigating the problems dealt with in this study.

This study in particular is a contribution to social rather than medical history. As such it does not attempt to offer a technical or clinical analysis of the medicines or diseases mentioned. The term health in this study is defined as the `total physical, emotional, mental and social well-being' of African mine workers and their families.[15]

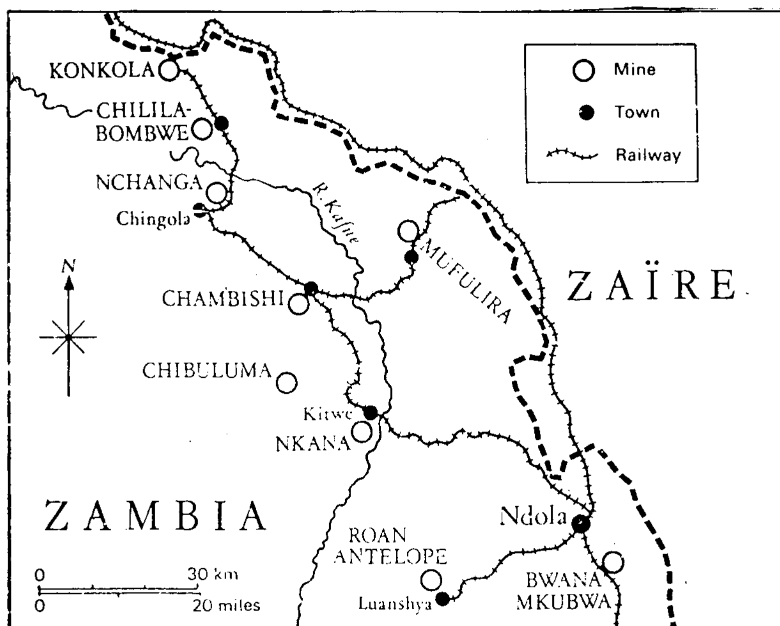
Area of Study and Historical Background

This study focuses on the Roan Antelope Mine. As maps I and II indicate, the mine is located on the Zambian Copperbelt. Specifically, Roan Mine is situated at Luanshya, a small mining town about fifty kilometres south-west of Ndola. It is linked to the latter town by rail and road.

Map 1: Location of the Copperbelt in Zambia



Map 2: Location of Roan Antelope Mine on the Copperbelt



Source: Roberts, History of Zambia, p. 187.

The Roan Antelope Mine presents an ideal case study for a number of reasons. Not only is it the oldest large scale mine in Zambia, but it also recorded the highest rate of mortality of all the mines in the first two decades of industrial mining in Zambia.[16] This mine also right from its outset encouraged miners to bring women and children to Luanshya as a way of fostering labour stabilisation, a policy which meant creating conditions of labour permanence on the Copperbelt. The year 1920 is taken as the point of departure because it was then when leading financiers took interest in the ore deposits at Luanshya and subsequently pumped in capital which enable the opening of the mine. The terminal year, 1964 marks the end of the colonial era and inception of the post colonial period.

Evidence of mining in the Luanshya area predates the advent of Western explorers, concessionaires and mining magnates. Long before the arrival of Europeans, the local Lamba at Luanshya mined, refined and cast copper in bark mounds.[17] Part of the copper was paid as tribute to chiefs and part of it was used as a form of currency as well as making ornaments and tools like anklets, bracelets, hoes and axes.[18] Pre-capitalist mining at Luanshya and elsewhere on the Copperbelt was, however, on a very small scale and was confined to ore outcrops.

For unexplored reasons, precolonial mining in Luanshya area was abandoned before the beginning of colonial rule. This was probably caused by increased warfare and slave trade in the area in the 18th and 19th centuries.[19] It is also likely that the ancient copper workings were abandoned because of the unhealthy environment in which outcrops occurred.[20] Whatever the case, African mining

operations had completely come to an end in the area by the time Europeans arrived.

The origin of modern mining at Luanshya goes back to 1902. In that year William Collier of Bechuanaland Exploration Company discovered the ancient workings and surface ore deposits at what later became Roan Mine.[21] Although the next few years saw a fair amount of work on Collier's findings, work came to a standstill in 1907. For nearly the next twenty years Collier's claims hardly received attention from British leading financiers and politicians. This was probably because Britain had ample sources of copper in better developed parts of her empire. Luanshya, where Collier made his discoveries, was more or less a cinderella of the British empire with neither a rail nor road infrastructure. To develop the early discoveries would have necessitated vast transport investments.[22]

The delay in developing the findings of William Collier was also caused by other factors. The findings occurred in an unhealthy area ridden with diseases, notably malaria, blackwater fever and other deadly tropical diseases. The area was therefore considered not conducive for European settlement.[23] Another factor which prolonged the delay was the lack of the realisation that beneath the surface deposits of copper was an enormous zone of sulphide copper deposits which could be worked profitably on a large scale. Collier's findings were of poor quality averaging only between 3 and 5 percent. They thus attracted less attention from financiers than Katanga deposits which averaged as much as 15 percent.[24]

From the early 1920s, however, Britain and Europe as a whole began to take keen interest in Copperbelt mineral deposits. This followed the depletion of copper reserves during the First World War, the rise in copper prices due to the depression of the early

1920s and the surge in the automobile and electrical industries in Europe which heavily relied on copper products.[25] Coupled with the possibility of defeating malaria, as Malcom Watson a leading malariologist had earlier done in Malaysia, the Luanshya and other deposits on the Copperbelt became a central focus of some of the most leading mining magnates in the world.

When the British South Africa Company began to grant mining concessions to powerful companies in 1922 Alfred Chester Beatty, one of the outstanding financiers, acquired the Luanshya claims for his newly floated Rhodesian Selection Trust. He financed the initial exploration, prospecting and drilling programme between 1923 and 1926 at a cost then considered enormous, estimated in the range of £600,000 to £3,250,000.[26] The drilling programme revealed the rich zone of underground sulphide ore in 1924-25.[27] With this revelation, Chester Beatty interested another notable financier, Otto Sussman, of the American Metal Company and other American concerns in the ore deposits at Luanshya. Between them American interests put up £175,000 required for the early development of the Roan Antelope Mine.[28] This vast outlay of capital coupled with the best mining technology in the world brought in the wake of American involvement enabled the inception of construction of the Roan Antelope Mine towards the end of the 1920s. In 1931 the mine went into production. In the same year the very foundation of the nascent industry was shaken by the Great Depression. Most of the mines on the Copperbelt were closed but the Roan Antelope Mine survived the economic slump by instituting cost reduction measures which, as will be seen later, had serious ramifications on the health of miners, their wives and children. Increased demand for copper in the post depression era especially during the Second World

War led to firm establishment of the Roan Antelope Mine in particular and the copper industry as a whole as one the leading industries in the world.

From the start, the mine workers and the management regarded cheap African labour as the key asset in the success of the Roan Antelope Mine—a view which was also supported by the colonial state.[28] In effect, this view manifested itself in the company's labour strategy aimed at minimising expenditure on African accommodation, diet, wages, sanitation, water supply, medical care and even safety equipment. At the same time, the owners of capital strove to maximise production and in so doing African labour was subjected to massive exploitation. This labour strategy culminated in the creation of a favourable environment both for accumulation of profit and development of various diseases and their subsequent proliferation in the African mining community.

In theory, the colonial state had the responsibility of ensuring or enforcing minimum health conditions in the copper industry. Practically however, the state left the onus in the hands of the cost-conscious mining companies. Like other colonial states in Africa, the colonial state in pre-independent Zambia was too pre-occupied with fostering primitive accumulation.[30] Thus although the state, in corroboration with mining capital, designed labour mobilisation measures and pass laws to ensure the flow of labour to the Copperbelt and other capitalist interests, it did little to ensure that health regulations were observed by employers of African labour.

While mining companies paid little attention to health issues of labourers their profits soared throughout the colonial period. In 1935 for example, RST recorded its first dividends and these

increased during the Second World War when the demand for copper expanded. In the mid 1950s, the RST recorded a net profit of £8 million after paying taxes.[31] The depression of the second half of the 1950s adversely affected the mining operations at Roan but still the mine was able to realise £4.9 million as profit by 1960.[32] The mining industry on the Copperbelt as a whole generated enormous returns for its owners paying out a total sum of £259 million in dividends to the shareholders between June 1954 and June 1964.[33]

.The Rhodesia Selection Trust preferred stabilized married labour to oscillating labour. As Chauncey argues this arose out of the precarious position of the Roan Antelope Mine and other copper mines in the southern Africa regional economy.[34] In common with other mines on the Copperbelt, the Roan Antelope Mine had to compete for African labour with long established labour markets in colonial Zimbabwe, Zaire and South Africa. When mining operations began at Luanshya, labour and health conditions were by far inferior to those obtaining at the already-established labour markets. Encouragement of married labour was seen as one way of meeting the challenge. It was correctly envisaged that women would be an attraction to labour, and more importantly, would maintain their husbands in good health in various ways. These included cleaning huts, cooking and washing for miners and also supplementing company food issued to workers.[35] To this end, the management allowed miners to bring their wives and children to the mine, allocated company plots to the miners' wives, and from the early 1930s permitted women to brew and sell beer in the compound.

At the Roan Antelope, the need to foster married labour was realised between 1929 and 1932 when a study conducted there revealed

that married workers were healthier, more contented, and even more efficient in mining operation which involved considerable risks to life than single labour.[36] The impetus for married stabilized labour also emanated from the fact that married African employees stayed longer in employment and their rate of turnover was lower than among unmarried miners.[37] Thus the value of women to mining capital cannot be emphasised. By rendering their services to miners, women greatly helped in reducing the cost of both the generational and daily labour reproduction for the mining companies. One eminent scholar has aptly analyzed the value of women's labour to mining capital in the following way:

> Women's unpaid labour, performed in the compound, reproduced labour power on a daily basis and increased it's reproductivity more cheaply than could companies directly. Thus ... the ability of capital in Northern Rhodesia to extract greater surplus value depended on its success in relocating women's reproductive labour to the urban area.[38]

That women's role was of much value to capital cannot be disputed. As early as the 1930s, the management at Roan attributed the increasing efficiency and stability of black labour to the presence of women in the compound.[39]

Married labour formed an integral part of the labour strategy of the RST due to the reasons advanced above. Herein lies the justification for the need to examine not only miners' health but also that of their wives and children. This study demonstrates that despite the value of women's labour to the RST, the company considered the health of women, like that of children of miners, as secondary. For several years after the opening of the Roan Antelope Mine, management, as this study shows, provided no medical facilities for workers' dependants. When such facilities began to be offered in the late 1930s they were by no means adequate.

As in matters pertinent to medical care, the management considered the feeding, housing and general welfare of women and children in the compound as insignificant. This study demonstrates that less attention was given by mine management to the feeding and accommodation of the families of African employees even long after the fiscal stand of the mine improved. As medical care, feeding and general well being of the miner himself was considered crucial in physical reproduction of labour power, the management ensured that the worker was comparatively better cared for than his own family.

The discrimination in the provision of medical services as well as feeding bore both positive and negative results. On the one hand, the relative superior services the miner enjoyed made him relatively healthier and in this way increased his productive capacity. On the other hand, the inferior medical care and feeding to which miners´ wives and children were subjected undermined their health. This argument is vindicated by the fact that at the close of the period covered in this study, the rate of mortality among miners themselves had dropped to a mere 2.13 per thousand from 30.9 per thousand in the formative years.[40] Yet no such remarkable record was noted for miners´ wives and children. By 1963, the death rate of miners´ children and their mothers was higher than 30.61 per thousand.[41] Such a glaring discrepancy in mortality rates was clearly a product of managerial indifference *vis-a-vis* the health of miners´ families.

NOTES

1. For the contribution of copper alone to the total value of the country's exports in the 1930s and recent times respectively see Andrew Roberts, A History of Zambia (London: Heinemann, 1976), p. 186; Muna Ndulo, Mining Rights in Zambia (Lusaka: Kenneth Kaunda Foundation, 1987), pp. 5-6; see also Philip Daniel, Africanisation, Nationalisation and Inequality (London: Cambridge University Press, 1979), pp. 4-24.

2. This is in spite of the availability of a few gender studies on women's labour in the mining industry. See George Chauncey, "The Locus of Reproduction: Women's Labour on the Zambian Copperbelt, 1927-1953", Journal of Southern African Studies, 7, 2 (April 1981), pp. 136-164; Jane L. Parpart, "The Household and Mine Shaft: Gender Struggles on the Zambian Copperbelt, 1926-1964", Journal of Southern African Studies, 13, 1 (October 1986), pp.36-56.

3. See Charles W. Coulter, "The Sociological Problem", in J. Merle Davis (ed.), Modern Industry and the African (London: Frank Cass, 1976); A.L. Epstein, Politics in an Urban African Community, (Manchester: Manchester University Press, 1958); J. Clyde Mitchell, "The Kalela Dance: Aspects of Social Relationships Among Urban Africans in Northern Rhodesia", Rhodes-Livingstone Paper, No. 27 (1956); Hortense Powdermaker, Copper Town: Changing Africa (New York: Harper and Row, 1962).

4. See Epstein, Politics.

5. Coulter, "The Sociological Problem".

6. See E.L. Berger, Labour, Race and Colonial State: The Copperbelt from 1924 to Independence (Oxford: Clarendon Press, 1974); Berger, "Government Policy Towards Migrant Labour on the Copperbelt, 1930-1945", Transafrican Journal of History, 2,1 (January 1972), pp. 83-102; Ian Henderson, "Labour and Politics in Northern Rhodesia 1900-1952: A Study in the Limits of the Power of the Colonial State", (Ph. D. Thesis: University of Edinburgh, 1972, on UNZA microfilm).

7. Charles Van Onselen, "Mines, Migrants and Proletariats", Journal of African History, 17, (1976), p. 146.

8. See Lewis Gann, Central Africa: The Former British States (Eaglewood Cliffs: Prentice Hall, 1971); Gann, A History of Southern Rhodesia: Early Days to 1934 (London: Chatto and Windus, 1965); Gann and Peter Duignan, Burden of Empire: An Appraisal of Western Colonisation in Africa South of the Sahara (London: Pall Mall Press, 1968); Michael Gelfand, Northern Rhodesia in the Days of the Charter (Oxford: Basil Blackwell, 1961); Gelfand, "Migration of African Labourers in Rhodesia and Nyasaland 1890-1914", The Central African Journal of Medicine 7, 8 (1961); Gelfand, A Service to the Sick: A History of Health Services for Africans in Southern Rhodesia 1980-1953 (Gwelo: Mambo Press, 1976).

9. See Gann, Central Africa, p. 112.

10. See Henry S. Meebelo, African Proletariats and Colonial Capitalism: The Origin, Growth and Struggles of the Zambian Labour Movement to 1964 (Lusaka: Kenneth Kaunda Foundation, 1986); Charles Perrings, Black Mineworkers in Central Africa (London: Heinemann, 1979); Chipasha Luchembe, "Finance Capital and Mine Labour in Zambia and Peru 1890-1980", (Ph.D. Thesis, University of California, 1982); Jane L. Parpart Labour and Capital on the Copperbelt (Philadephia: Temple University Press, 1983); On Colonial Zimbabwe see Charles Van Onselen, Chibaro: African Mine Labour in Southern Rhodesia 1900-1953 (London: Heinemann, 1979); Van Onselen and Ian Phimister, Studies in the History of Mine Labour in Colonial Zimbabwe (Gwelo: Mambo Press, 1978).

11. See Charles Van Onselen and Ian Phimister, Studies.

12. Perrings, Black Mineworkers.

13. Luchembe, "Finance Capital", Parpart, Labour.

14. See Chauncey, "Locus", p.136; Pim Commission, Report of the Commission Appointed to Enquire into the Financial and Economic Position of Northern Rhodesia Colonial No. 145, (London: His Majesty's Stationery Office, 1938), pp. 41-45.

15. This definition derives from Kabede Tadesse, "Health Problems Resulting from Famine", in A.M. Hussen (ed.) Drought and Famine in Ethiopia (London: International African Institute, 1976), p. 59.

16. Luchembe, "Finance Capital", p. 201.

17. D.D. Irwin, "Early Days on the Copperbelt", Northern Rhodesia Journal of History 1, 6 (1965), p. 112. For details on pre-capitalist mining see Kenneth Bradley, Copper Venture: The Discovery and Development of Roan Antelope and Mufulira (London: Company Publication, 1952), pp. 28-29.

18. Richard Hall, Zambia (London: Pall Mall Press, 1966), p. 249.

19. ZCCM/RACM 12/7/4C/3: E.C. Bromwich, "General Historical Roan", 1962-1963.

20. Ibid..

21. See Bradley, Copper Venture, pp. 64-74; Lewis H. Gann, A History of Northern Rhodesia: Early Days to 1953 (London: Chatto and Windus, 1964), 117; Hall, Zambia, p. 251.

22. ZCCM/RACM 12/7/4C/3; Bromwich.

23. Ibid..

24. See L.H. Gann, "The Northern Rhodesia Copper Industry and the World, 1923-1952", Rhodes-Livingstone Journal 18 (1955), pp. 4-6; Gann, History, p. 204; ZCCM/RACM 12/7/4C/3: Bromwich.

25. Gann, "Northern Rhodesia", p. 4; Gann, History, p. 204.

26. See Bradley, Copper Venture, p. 92.

27. See Northern Rhodesia, Mines Department Annual Report for the Year 1925 (Livingstone: Government Printer, 1926), pp. 1-2.

28. This amount of capital investment derives from RCM Ltd, Zambia´s Mining Industry: The First 50 Years (Ndola: Company Publication, 1978), p 29; Francis L. Coleman, The Northern Rhodesia Copperbelt 1899-1962 (Manchester: Manchester University Press, 1971, p. 49; ZCCM/RACM 12/7/4C/3: Bromwich.

29. See for example NAZ/SEC 1/1293: W. Scrivenor, "Native Labour as Affecting the Copper Industry of Northern Rhodesia", 17 (August 1934).

30. Parpart, Labour, p. 36.

31. Berger, Labour, p. 7.

32. Berger, Labour, p. 7.

33. Berger, Labour, p. 7.

34. Chauncey, "Locus", pp. 135-137; See also Pim Commission, Report, pp. 29-35; Parpart, Labour, pp. 30-33.

35. NAZ/SEC 1/1293: Scrivenor, "Native Labour"; ZCCM/RACM/W(2) HA 62: Report by A.J. Orestein, 1929.

36. Coulter, "Sociological Problem", p. 61; Parpart, Labour, p. 36.

37. C.F. Spearpoint, "The African Native and the Rhodesia Copper Mines", (Supplement), Journal of Royal African Society 36, 115 (July 1937), p. 53; Coulter, "Sociological Problem" p. 61.

38. Chauncey, "Locus", pp. 135-137.

39. See ZCCM 15/1/3B: R.M. Peterson to Inspector of Mines, 19 January 1934; Chauncey, "Locus", p. 139.

40. ZCCM/RACM 12/7/4C/3: Bromwich.

41. ZCCM/RACM 11/6/6B/3: 35th Medical Annual Report 1963.

CHAPTER ONE

ECOLOGY AND HEALTH CONDITIONS IN THE FORMATIVE YEARS, 1920-1938

Between 1920 and 1938, the Roan Antelope Mine witnessed very high rates of mortality and morbidity amongst its African mineworkers and their dependants. The level of mortality reached such an alarming proportion that by 1930 the mine was notoriously known as the "Death Valley".[1] This chapter seeks to explain what forces engendered this situation. The chapter places the causes of death and ill-health against a brief background of the mineowners' and management neglect of the hospitalisation of Africans especially before 1934. The major argument in this chapter is that the high death toll and level of sickness during the formative years must be sought in ecologically determined ailments; faecally-related diseases like typhoid and air-borne diseases such as pneumonia and cerebro spinal meningitis, all of which were inextricably linked to defective living and working conditions on the mine. The defective conditions reflected the management's labour strategy aimed at reducing expenditure on African labour so as to realise surplus value.

Although the colonial state bore the responsibility to ensure good health conditions in the mining industry, it was too preoccupied with rendering African labour cheap to sufficiently protect workers and their families from the defective conditions. In effect, Africans in the mining industry as a whole and at Roan Antelope Mine in particular could not count on state intervention for amelioration in conditions that engendered disease.

The high rate of mortality and morbidity which characterised the Roan Antelope Mine especially between 1920 and 1930 must be seen

against a background of management neglect of matters relating to African hospitalisation and medical care. Throughout the prospective period at Roan, the management failed to build a hospital for blacks even though millions of pounds sterling were pumped into the initial prospecting and drilling programme. Medical care for miners was virtually non-existent. There was only one medical doctor who mostly dealt with European patients or spent his time examining new African recruits.[2] It was thus not uncommon for even "serious cases of illness" not to receive medical attention early and this led to loss of lives which would have otherwise been saved.[3]

When construction of the mine began in the late 1920s, a three-roomed mud and pole hut was built to serve as a hospital for African employees.[4] It was far from being ideal for accommodating the sick. It lacked an operation theatre, a nurses duty room, a storeroom for drug or medical instruments, nor did it have an isolation ward for contagious diseases. According to the mine's first Chief Medical Officer, J.W. Phillips, another hut near the so-called "native hospital" served all these purposes but even this hut was so crudely designed that "any operation would have the sun and the stars as its witnesses".[5]

Modern medical equipment, which, like suitable hospital buildings and regular medical care, constitute a vital element of hospitalisation received little attention from the management. Phillips again noted that:

> ... of equipment, of instruments, of laboratory facilities of any diagnostic or therapeutic aids, there were practically none ... to me it has been a never-ending source of wonder that a diagnosis was ever confidently made or treatment adequately applied.[6]

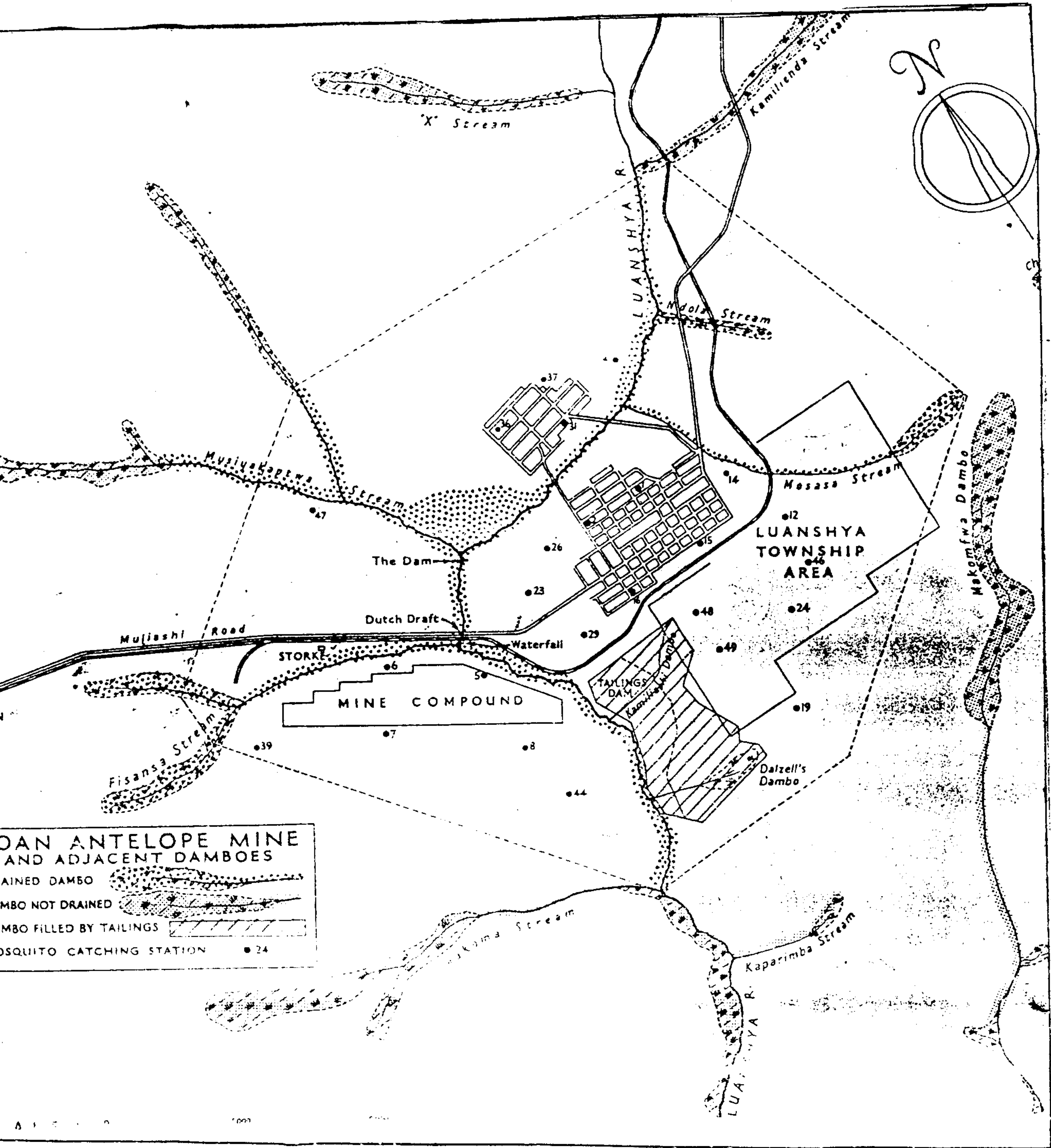
In the absence of medical equipment, diagnosis of disease was largely done by guess work. Ironically, the management made every effort to procure equipment like microscopes for use at the European hospital. That more lives were lost at the African hospital than at the European hospital was partly due to the poorer quality of the diagnostic and therapeutic treatment that African miners were subjected to.[7] It is against this inferior form of hospitalisation of Africans that the killer diseases that cut a wide swathe in the African labour force and left many Africans sick will be examined.

Ecology, Malaria and Blackwater Fever 1920-1930

Among the principal killers of both white and black labour at the Roan Antelope Mine during the first decade were malaria and blackwater fever. Both of these diseases were ecologically-determined. The Roan Antelope Mine stood in an area whose ecology was climatically marked by very wet months between November and April and very hot months in September and October. This type of climate was ideal for the breeding of mosquitoes which are malaria vectors.

The Roan Antelope Mine lay in a particularly unhealthy environment. As map III indicates, the mine stood astride the Luanshya River in a valley with extensive swamps on either side. It was practically hemmed in by unhealthy swamps and streams. The latter included the Masasa to the east, the Musiyakapatwa to the north and the Kalyamishi to the south. The Luanshya river and these streams did not only choke with vegetation, but were also sluggish and their banks were covered with bushes which provided sanctuary to mosquitoes.[8] Aggravating this malaria-prone environment were

Map 3: Environment of the Roan Antelope Mine



Source: Watson, African Highway, between pages 58 and 59.

natural and artificial depressions created during the construction of housing units, the mine itself, as well as the line of rail and road between Ndola and Luanshya in the late 1920s. These depressions formed a perfect breeding ground for mosquitoes in the rainy season when rain water collected in them.

The Luanshya urban ecology and environment were ideal for the multiplication of the deadly malaria vectors—the Anopheles gambiae and Anopheles funestus. The swamps in the vicinity of the mine were conducive to the breeding of the former while the latter freely bred in the depressions on the mine site.[9] Malaria at the Roan Antelope Mine was therefore endemic and the disease largely accounted for very high rates of death and sickness among miners and their families.

It is difficult to state exactly how many lives malaria claimed during the initial prospective and drilling stage of the mine, which roughly lasted between 1920 and 1926. For this period records are non-existent. Until 1927 mines on the Copperbelt were not legally obliged to keep mortality records. Even after that period up to 1937 health records on miners' families are erratic and unreliable because there were no organised medical services for African women and children in the compound. However, figures which began appearing from 1927 onwards indicate that malaria alone killed numerous employees both European and African. The disease was also responsible for the high incidence between the two communities. In 1927 itself, 142 Africans were indisposed with malaria while the incidence of this ailment alone stood at 98.10 per thousand.[10] Malaria also decimated a large number of the white labour force. In the same year, twenty-seven new European miners at Roan died of malaria, some of them within a fortnight of their arrival.[11] At

the same time, the incidence of the disease among white families was 105 per thousand.[12] With such a high level of incidence, it was not unusual for not less than 30 percent of the European labour force to daily absent themselves from work due to malaria.[13]

Associated with malaria was its equally deadly cousin, blackwater fever. With malaria, blackwater fever claimed "one victim in every two it struck".[14] Together blackwater fever and malaria acquired a very bad reputation for Luanshya. European miners who passed through Cape Town were jokingly told not to buy a return ticket to the mine or other mines on the Copperbelt as they would be decimated by malaria and blackwater fever.[15]

Among Africans, rumour spread that the numerous deaths on the mine were caused by Sanguni, a mythical snake believed to dwell in the Luanshya River. According to the legend, Sanguni cast a spell on the miners as they forded the river.[16] This myth was effective in keeping Africans away from the Roan Antelope Mine. Africans who inadvertently found themselves at the mine, deserted in such large numbers that the mining activities in the early years of mining sometimes completely came to a standstill.[17] A vigorous recruitment campaign in the countryside by the mine's recruitment bureau proved as futile as state labour mobilisation measures introduced in 1927 and 1933 to assist the mushrooming mines on the Copperbelt procure the required labour.[18]

The Sanguni myth found recipient minds among the recruited labour almost all of whom came from peasant societies replete with such myths. Given the informal nature of proletarianisation among miners during this period, Africans looked for solutions to their ill-health not from within the industry but from within the peasant society. In this, they shared similar experiences with their

counterparts in the Bolivian tin mines and Peruvian copper mines where similar responses to ill-health have been documented.[19]

At Roan, malaria and blackwater fever thus proved a serious deterrent to mining capital. The maladies lowered the vitality and efficiency of workers, led to a critical shortage of labour and undoubtedly pushed the cost of labour recruitment high. Malcom Watson a malaria control expert who visited the mine in 1929 later reported that malaria and blackwater fever severely hampered construction work.[20] It is in this light that the anti-malaria measures the management employed will be examined, analyzed and their effectiveness assessed.

The earliest measures against malaria and blackwater fever were favoured by the management because they involved little capital outlay. The management encouraged white employees to take five tablets of quinine daily and a custom developed on the mine whereby the drug was taken with large amounts of whisky and gin.[21] This anti-malaria measure was encouraged at a time when health records were hardly kept and it is thus difficult to assess with exactness how effective the medicine was. The post-1927 records, however, indicate that the incidence of malaria among European miners were very high standing at 105 per thousand in 1927 itself and in 1928. It is also clear that instead of curing or preventing ecologically-determined diseases the large amounts of alcohol taken with quinine merely resulted in much violence on the mines. According to Elizabeth Jones, one of the earliest European women to work at Roan, consumption of large quantities of alcohol led to much violence between white miners themselves.[22] It is also likely that this violence also spread on to African employees. It was not until the

Second World War, however, that white-on-black violence assumed epidemic proportions at Roan.

The next measure also taken before 1927 when the mine began to keep its records, was exorcism of the Luanshya River. This was done in the belief that it could appeal to the African psyche. The management, according to the first compound manager at Roan, C.F Spearpoint, invited "Chirupula" Stephenson, a white pioneer renown for cruelty to Africans, who had been living in the colony since the turn of the century to exorcise the Luanshya River of Sanguni. In turn, Stephenson asked a local Lamba family living near the mine to perform an appropriate ceremony. The family sacrificed an ox, a white cockerel and beer to their ancestral spirits in return for the payment of some money and blankets by D.D. Irwin, the first General Manager at Roan.[23]

Like in the case of quinine it is difficult to state how effective this ceremony was in reducing malaria cases and deaths on the mine. But it is clear by post-1927 records that large numbers of black miners and their families continued to succumb to the disease. Nor did any ethnic group other than the Lamba themselves believe in the efficacy of the rituals performed. The Bemba for instance, informed Spearpoint that Lamba ancestral spirits could not be expected to intercede on behalf of the Bemba.[24] Exorcism, which was aimed at ridding the mine of sanguni, was therefore a failure.

The third and most important anti-mosquito step was undertaken in 1929-30. In that year, the management at Luanshya and the directors in London commissioned the Ross Institute of Tropical Hygiene in England to launch an anti-malaria campaign at the Roan Antelope and Mufulira Mines. The President of the Institute, Malcom

Watson, a distinguished malariologist with vast experience in malaria control in Malaya, became the mines' health advisor.[25] After visiting the Roan Antelope Mine in 1929, Watson outlined an anti-malaria programme. It included the canalization of the Luanshya River to increase its velocity, clearing and ditching the nearby streams, draining of swamps near the mine and those extending at least half a mile from the nearest mine building and also weekly oiling of stagnant water in depressions to kill mosquito larvae.

To implement the programme, the Ross Institute sent a three-man expedition towards the end of 1929. It comprised William Simpson, an eminent tropical sanitarian, who headed the expedition; Charles Robert Harrison, an expert in malaria control with enormous experience in swamp drainage in Malaya and finally, Charles Dalzeli who had earlier done special laboratory research in Central America.[26] Between them, these men implemented Watson's recommendations and introduced intensive treatment of malaria using mepacrine—a drug which coupled with other anti-malaria measures seems to have been more successful in treating malaria than quinine.[27]

This anti-malaria campaign proved more successful in controlling mosquitoes. This was particularly the case among whites for whom mosquito-proof houses were built as part of the anti-malaria combat. In the white community, the incidence of malaria and blackwater fever dropped from 105 per thousand in 1929 to 47 per thousand in 1930 while the death rate plummeted by almost half during the same period.[28] The incidence of malaria and blackwater fever, however, remained at this level until the Second World War when the introduction of DDT in the anti-malaria fight reduced the disease to almost a "vanishing point".[29]

Among Africans, malaria continued, to a reduced extent, to be endemic despite the campaign. Unlike Europeans, Africans lived in huts subject to entry by mosquitoes, which as Alfred Charles Fisher, the mine's Chief Medical Officer during the campaign noted, continued to defy the measures taken against them and which proved more difficult to combat than in Malaya.[30] In 1930 alone 444 Africans out of about 5,000 workers at Roan were treated for malaria and in subsequent years large numbers of Africans continued to report for malaria treatment.[31] That many Africans escaped death from malaria was largely because of the introduction of intensive treatment of the ailment with mepacrine and other anti-malaria drugs like chloroquine which were synthesised during the Second World War.[32]

The anti-malaria campaign can thus be said to have been more beneficial to white miners and their families than Africans. The unwillingness by the management to erect mosquito-proof houses meant that Africans continued to be subjected to mosquito bites. It is however also correct to observe that the campaign succeeded in at least making the Roan Antelope Mine relatively safe to both European and African communities. After 1930, the mythical proportion malaria attained in the preceding period seems to have died as no record after that date makes any reference to the myth.

Air-Water-Fly-borne Diseases and Health Conditions to 1930

Alongside malaria and blackwater fever, there were other killer diseases like pneumonia, cerebro spinal meningitis, bacillary dysentery, typhoid and diarrhoea all of which greatly contributed to the high rates of mortality and morbidity amongst Africans at the

Roan Antelope Mine. The first two diseases are air-borne ailments and the rest are faecally-related. All these diseases were inextricably linked to defective conditions on the mine.

The earliest record on pneumonia at the mine under discussion and elsewhere is in the government medical report of 1925-26.[33] Although the report attributes the cause of pneumonia to variations in temperature, it does not state how many miners died of the disease, nor does it examine what conditions on the mine promoted the ailment.

A preventive disease usually spread by breath, pneumonia is characterised by chills, fever, coughing up of sputum, chest pains and severe weakness as well as breathing difficulties.[34] At Luanshya, pneumonia was one of the chief killers of miners. Its level of incidence among African workers in 1927 was more than 63 per thousand; in the same year it claimed 40 lives.[35] Two years later pneumonia incidence dropped to about 38 per thousand but the disease killed 44 African mineworkers in the same year.[36] In 1930, pneumonia assumed epidemic proportions: it afflicted 272 employees, seventy of whom lost their lives.[37]

Undoubtedly, the principal cause of this disease lay in sharp and rapid changes in temperature to which African workers and their families were exposed.[38] These temperatures were exacerbated by inadequate clothing. Poorly paid African employees could not afford to buy warm protective clothing. Thus as late as 1934, mineworkers at Roan reported for work in light cotton trousers, shirts and without underwear even in exceptionally cold seasons.[39]

Pneumonia infection at Roan Antelope Mine was also promoted by poor and inadequate housing. As part of its labour strategy aimed at reducing expenditure on African labour, the management at the

mine housed Africans firstly in one roomed mud-and-pole huts with thatched roofs. From the late 1920s, married workers were housed in Kaytor huts in the compound to the west of the Luanshya River. The huts were made of thatched roofs, sun-dried bricks and without windows. Single labour was accommodated in barrack-like dorms which, like Kaytor huts, were constructed with emphasis on saving building costs.[40] This form of housing, although seemingly akin to the traditional type, was conducive to pneumonia. The huts were subject to rapid degeneration and dampness in the rainy season largely due to marshy surroundings. And although each of these huts was designed to accommodate only three, five to eight miners usually shared one hut.[41] Under such conditions, the spread of pneumonia was faster. In 1927, the annual medical report attributed the presence of pneumonia on the mine and elsewhere to poor housing.[42]

The lack of change houses for African employees was another debilitating cause of pneumonia. It was not until after independence in 1964 that the RST erected change houses for the bulk of the African work force.[43] In practice this meant that underground Africans were exposed to drastic temperature changes after working underground and this rendered them susceptible to infection by pneumonia.

Insufficient and poor diet on which miners lived also played a key role in inducing pneumonia. Africans at Roan Mine lived on meagre rations because of management resolve to reduce the cost of feeding labour and also due to difficulties in obtaining food. Geographically, the mine stood in an area conspicuous in the absence of viable commercial and African peasant agriculture. This phenomenon came about as a result of the neglect of African agriculture by the British South Africa Company and after 1924 the

Northern Rhodesia Government. For many years the local people near the mine were not encouraged to become commodity peasant producers. At Roan, therefore, food could not be obtained locally but came from as far as colonial Zimbabwe, Zaire and South Africa at considerable cost to the profit-conscious management.

Before the construction of the rail line and the road between Luanshya and Ndola in 1929 and 1930, food was transported from Ndola by a company lorry or on ox-drawn wagons. It was not uncommon for the lorry to get bogged in mud for days or weeks during which workers went without food. Oxen also died of tsetse fly bite thus complicating food transportation.[44] The food problem worsened in the late 1920s when importation of cattle from Zimbabwe was banned due to the outbreak of East Coast Fever there. For black workers, the diet became so insufficient that Irwin, the General Manager, complained in a letter to the Rhodesian Selection Trust office in London that "boys" were not being properly nourished, but at the same time were required to do strenuous work.[45]

As regards food, the most adversely affected were single employees. These largely depended on food issues which were not only insufficient but also lacked nourishing nutrients. On the other hand, married workers coulde count on additional nutritious foodstuffs procured by their wives from the market in the compound and surrounding bush. Food deficiencies render people prone to pneumonia infection.[46] At Roan this was evidenced by the fact that single labour which was nutritiously "less well looked after" was more susceptible to pneumonia than married mineworkers.[47]

Underground conditions which promoted pneumonia abounded. Work occurred at 2,500 feet in wet and slippery mud and under very hot temperatures and very poor ventilation.[48] As late as 1940s

the flow of air underground was sluggish as the ventilation system at Roan was designed to operate at low depth. This was compounded by frequent blasting which was partly a result of the desire of the management to increase production and also partly necessitated by the nature of the ore-body at Luanshya.[49]

Other pneumonia-inducing agents underground included inept means of sanitation and arduous work which weakened miners' resistance to the disease. Underground sanitation at Roan Mine was done by pail system. The system, however, lacked official attention and thus buckets filled to capacity while waste remained uncollected for days.[50] At the same time, Africans were subjected to arduous work. This manifested itself in heavy week-long lashing and drilling, including working on Sundays when all workers by law were supposed to rest. Attempts by the colonial state to put an end to "Sunday labour" were successfully resisted by Frank Ayer, the General Manager, who, as late as 1937 bluntly told government officials that "it was his intention to work his mines (i.e. Roan and Mufulira) on Sundays".[51] Africans, therefore, continued to be overworked without state protection.

Given all the debilitating agents underground, African miners there tended to be in a vulnerable position *vis-a-vis* pneumonia. Available evidence suggests that more underground employees whether single or married succumbed to infection by this disease than their counterparts on the surface.[52]

At Luanshya, pneumonia thus created a distinct pattern which indicates that its causes were embedded in the living and working conditions on the mine. As earlier argued, it was more common among single workers whose diet was deficient than among married miners. Single employees also shared more overcrowded accommodation than

married workers. The spread of pneumonia was therefore faster. Secondly, the disease was more prevalent amongst underground workers owing to the deplorable conditions under which they did heavy work for long working hours. Pneumonia was, thirdly, more devastating in new miners. These workers arrived on the mine in an emasculated situation, but were made to do arduous work without sufficient hardening and acclimatization. New recruits were also the least well accommodated and usually arrived at Luanshya in an underfed condition after long journeys usually on foot from the countryside.[53] Nearly all those who died of pneumonia soon after the Great Depression of the early 1930s were new miners.[54]

In contrast, the incidence of and mortality from pneumonia amongst white miners were almost non-existent at the Roan Antelope Mine. Miners of European descent lived in well ventilated houses which in fact were as early as 1930 comparatively superior to even those occupied by most of the working population in Britain.[55] Well paid, white miners could live on nutritious food. They could also afford warm protective clothing. At work they generally did managerial or supervisory jobs as opposed to heavy duties performed by blacks. In this way, white miners and their families were not exposed to pneumonia-promoting agents. The absence of pneumonia among whites and its prevalence in the black community were thus a good measure of the rudimentary conditions under which the latter lived and worked at the Roan Antelope Mine.

Like other colonial employers in Central Africa, the management at the Roan Antelope Mine were aware that pneumonia could be prevented if African clothing, sanitation, housing, diet and general working conditions were improved. The managers in general and the mine medical department in particular were not oblivious of

medical expertise on this ailment. As early as 1914, a prominent British authority on pneumonia had convincingly argued that:

> The way to prevent pneumonia is to increase the resisting power of the individual, hence you should encourage temperature and avoidance of all debilitating agencies, such as undue exposure, over fatigue, and work in insanitary, stagnant, moist atmosphere. There should be an abundant supply of fresh air night and day; the body temperature should be maintained by proper supply of food and there should be suitable external clothing.[56]

Rather than confront pneumonia from this preventive perspective, the cost-conscious management adopted a less expensive albeit unsuccessful approach. In 1930, when seventy African labourers died of pneumonia, the managers at Roan invited Dr. Ordumann of the Institute of Medical Research of South Africa to advise on what vaccines were appropriate.[57] Undoubtedly influenced by the South African labour attitudes towards Africans, Ordumann recommended the use of prophylactic vaccines rather than amelioration of the conditions which induced pneumonia. The vaccines proved ineffective. The death rate of the disease under discussion merely dropped by 5 percent and its level of incidence remained almost intact.[58] The Chief Medical Officer on the mine described the attempt to rid Roan Antelope Mine of pneumonia by use of prophylatic vaccines as a "shot in the dark". He in vain requested the management to carry out full scale investigation into what caused the disease.[59] To the contrary, the management introduced ineffective sulpha drugs whose cost without any doubt was cheaper than it would have required to improve housing, diet, clothing and sanitation for the African community.

Management's resolve to find inexpensive answer to pneumonia continued into the late 1930s. The introduction of a drug called M&B 693 provided a partial answer. The effectiveness of this drug

was noted by the mine's manager who in a letter to the General Manager wrote that:

> A new drug M&B 693 which we just started to use appears to have more beneficial results than the best serum available.[60]

This observation was collaborated by Charles Alfred Fisher, then Chief Medical Officer at Luanshya.[61] The effectiveness of M&B 693 was, however, in curing rather than preventing pneumonia. As Table I indicates, the incidence of pneumonia remained relatively stable among workers after 1939 when the drug was introduced at the Roan Antelope Mine. It is therefore clear that the cost-conscious managers of the mine hardly improved African housing, diet, clothing and working conditions in which what caused the disease was embedded.

Table I: Mortality and Incidence of Pneumonia Among African Miners at Roan Antelope Mine 1930-1949

YEAR	CASES	DEATHS	RATE %
1930	272	70	25.7
1931	234	48	20.0
1932	23	9	13.0
1933	88	12	10.0
1934	297	8	4.4
1935	89	4	8.9
1936	52	14	7.6
1937	164	12	8.5
1938	153	6	7.8
1939	107	4	5.6
1940	70	4	8.5
1941	144	10	7.8
1942	295	10	5.6
1943	271	14	5.8
1944	211	12	6.9
1945	223	9	3.4
1946	164	3	5.1
1947	221	14	5.8
1948	158	8	4.0
1949	185	7	1.8

Source: Adapted from Watson, African Highway, p. 180.

Other Diseases

Besides pneumonia, there were other respiratory air-borne diseases whose causes and method of spread were similar to pneumonia and also brochial-related diseases. These included influenza and cerebro spinal meningitis. Of the two maladies, the latter was the more deadly killer. In 1930, cerebro spinal meningitis alone killed twenty African miners.[62] As a disease, cerebro spinal meningitis is a viral or bacterial inflammation of the membranes of the spinal cord. Its symptoms include severe headache, neck stiffness, fever, vomiting, drowsiness, fear of bright light and loss of consciousness. It is a highly contagious disease which, like pneumonia, is spread by breath.

At the Roan Antelope Mine, the spread of meningitis was facilitated by overcrowding in the sleeping quarters especially among bankungulume (unmarried employees). Until after the Second World War when anti-biotic drugs were introduced in Central Africa, nearly every patient of cerebro meningitis died.[63] As will be argued later, bronchial-related diseases did not, however, constitute a major health problem until the Second World War.

Alongside malaria, blackwater fever, influenza, pneumonia and cerebro spinal meningitis, the African mining community was also plagued by faecally-related diseases which could be linked to insanitary conditions in the black miners' compound. Most notable of these were typhoid, diarrhoea, hookworm and bacillary dysentery. The latter became so rampant at Roan in the early days of mining that it became nicknamed *Roanitis*.[64]

The outbreak of these diseases assumed epidemic proportions at the Roan Antelope Mine. One major source of diarrhoeal ailments on

the mine was contaminated water. Until the installation of a small filtration and chlorination plant on the nearby Kafubu River towards the end of 1929, miners obtained their domestic water from the Luanshya River.[65] This water supply was not protected from faecal contamination especially during the rainy season when drainage from the fouled slopping ground near the African compound and European camp poured into the river. The danger of contamination of water was furthermore not removed with the installation of the purification plant. The health personnel at the mine noted as late as 1939 that the plant was too small and ineffective to purify the amount of water required by the mining community.[66] Infected water therefore continued to find its way into the compound for the ten years that the small water plant remained in use on the mine. The contribution of bacteriologically infected water to the outbreak of typhoid was first recorded in 1929-30. In that period, a serious epidemic of typhoid swept through the compound killing sixteen Africans out of forty-four typhoid patients.[67]

The mine owners' neglect of matters pertinent to sanitation constituted another major source of faecal-oral-route diseases. This neglect manifested itself in the fact that for many years there was no organised system of garbage disposal and in the absence on the mine of efficient means of disposing of night soil. The earliest means of sanitation at Roan comprised Arab pit latrines. These were simply pit latrines around which crude grass shelters were erected. When construction began, Arab pit latrines were replaced by fuming pit latrines which were similar to the former but through which smoke was passed to keep flies away. Both types of latrines were favoured by the management because, like the construction of miners' huts, they too involved considerable

economies of scale as all the material needed could be cheaply obtained locally. The Arab pit latrines and smoke pit latrines, however, posed a serious menace to health. In the case of the former there was no way of preventing or checking the breeding of the common fly. Similarly, unless smoke was continuously fumed into the smoke pit latrines, fly-breeding went on unchecked.[68]

Both forms of sanitation were most unpopular among Africans on the mine. Although these pit latrines were suitable for temporary settlements and for this reason were employed in some German posts in East Africa during the First World War,[69] they were not satisfactory for prolonged use by large numbers of people. They were easily fouled and Africans at the Roan Antelope Mine found it cleaner to accommodate themselves in the surrounding bush near the compound. This practice attracted the attention of government officials. The state however lacked an effective sanitary service as its sanitary inspectors were not only too unqualified but too few to enforce sanitation regulations in the mining towns.[70]

Given state failure to supervise sanitation and company reluctance to incur extra expenses on sanitation in the compound, insanitary conditions prevailed to an extent that they provided an ideal ground for the multiplication of flies. These flies were instrumental in the rapid spread of diarrhoeal diseases in the compound.[71]

The multiplication of the common fly was also encouraged by the unsatisfactory removal of garbage from the African compound. The onus to rid the compound of rubbish fell on the shoulders of the compound administration which also dealt with other equally challenging responsibilities like miners' housing, health, drainage, discipline and the general welfare of the people.[72] Given such

exacting responsibilities, the compound management usually neglected the problem of collecting and discarding refuse from the compound. The collection of refuse itself lacked official supervision and there were no incinerators.[73]

William Simpson, the Head of the three-man anti-malaria expedition discussed earlier, described in 1929 how filthy the mine was after he himself contracted _Roanitis_ and was admitted to hospital:

> While in hospital I have noticed on the screened windows and doors of my room an enormous number of flies especially on the south side some of which gain an entrance when the door is opened.... I inspected the surroundings of the hospital and I found across the road and next to the tailings from one of the shafts a plot of the ground which gave an explanation of the fly nuisance. Under cover of the bush and on the irregular ground all kinds of rubbish have been deposited forming an excellent ground for flies.... On open space, there have been deposited a quantity of rubbish and behind the workshop are several rubbish heaps and in other areas close by rubbish has been thrown in excavations.[74]

The area which Simpson referred to was very close to the compound. In the compound itself rubbish accumulated to such an extent that it posed a health hazard. In 1930, Malcom Watson noted that the large number of flies in the compound was due to the uncollected rubbish.[75] Much of this garbage was found in the single section of the compound. Unmarried employees could hardly sweep away refuse as they were usually too tired to even cook for themselves after work.[76] The married section, on the other hand, was comparatively cleaner as women swept the precincts of the huts and thus kept flies away. The discrepancy in the cleanliness of the two sections reflected itself in the higher number of cases of faecally-related diseases in unmarried workers than married employees. The long standing joke on the mine that anyone who befriended _bankungulume_ or single miners courted diarrhoea

emphasises how susceptible single labour was to diarrhoea and similar ailments.[77]

Available evidence on the prevalence of faecal diseases among single mineworkers suggests food contamination as the principal cause. According to Compound Manager Spearpoint, unmarried employees usually left the meat hanging from roofs as they were too tired to cook after doing arduous work, and also lacked storage facilities. He also observed that the meat was usually covered with flies.[78]

In the light of the above observations, it becomes difficult to extend to the Roan Antelope Mine Gann´s assertion that the introduction of modern means of sewerage disposal and water treatment in colonial Central Africa led to instant major improvements in the health of African workers.[79] As far as the Roan Antelope Mine is concerned, infected water and the inept disposal of human waste and rubbish were a source of ill-health for miners. As will be shown in subsequent chapters the contribution to poor health of unsatisfactory means of garbage and night soil disposal persisted on the mine for many years.

The Impact of Depression on Health Conditions 1931-34

The stock market crash of 1929 which hit the Roan Antelope Mine severely between 1931 and 1934 exacerbated disease generating conditions there. Like other Copperbelt mines, Roan Mine was at that time still in its infancy. In fact the Depression began when the mines´s first concentrator was under construction. The fall in copper prices occasioned by the slump had far reaching consequences on the operations of the mine and on African health. The

construction of the smelter was halted and the concentrates from the mine were "sacked and shipped to the American Metal Company plant at Carteret, New Jersey" as the price of copper dwindled down to a mere four American cents per ton.[80] According to David Dave Irwin, then General Manager at the Roan Antelope Mine:

> Had the metal company at this time not permitted Roan to draw cash against concentrates as they were placed on rail cars at Luanshya, the company in its weakened financial position could not have kept ahead of the sheriff. As soon as a car of concentrates was weighed and loaded, we rushed a cable to London. The payroll was met regularly, but at times it was a pretty near thing.[81]

Under its faltering financial acumen, the management successfully made rigorous use of its cost minimisation strategy with the hope of saving the new mine from closing. It retrenched the African labour force from about 10,000 to about a mere five thousand. At the same time the management of the mine reduced wages from 17 shillings 6 pence per thirty working days for a surface miner to 12 shillings 6 pence while the wages for underground miners declined from 30 shillings to 22 shillings.[82]

For Africans whose dependence on mining was by 1931 becoming pronounced, such measures had serious ramifications on health. The loss of employment created a melancholy state of mind in most of those laid off. As the Government Unemployment Committee appointed during the Depression noted, this melancholy state of mind weakened the victims of retrenchment to disease.[83] Neither the colonial state nor the management however found any tangible solution for those laid off other than repatriating them to villages. It was thus left to Africans on the mines to seek reprieve for themselves. Aware of the connection between the colonial state and mining capital, an ad hoc Bemba association despatched in 1933 a deputation to Livingstone, then the territorial capital, to fight against poor

wages and unemployment. At a meeting with the Secretary for Native Affairs, Henry Chibangwa, the head of the delegation, spoke for the retrenched Africans when he argued that:

> I am a clerk and interpreter. I have been without a post for eighteen months. People like me cannot go home. We have settled in towns, adopted European ways and no longer know village life.[84]

If Chibangwa did not speak for the entire labour force, he at least spoke of the educated Africans working for the mining industry. His sentiments reflect the rising consciousness in Africans and also their increasing dependence on the copper industry.

The cost minimisation measures introduced during the Great Depression were not confined to wages and retrenchment alone. Expenditure on African housing, diet, sanitation and medical care was reduced to a minimum. This led to such a serious deterioration in the health of Africans that the Roan Antelope Mine in 1931 lost more lives than all South African Rand mines and all those owned by the Union Miniere in Upper Katanga.[85]

Housing became a suitable target for reducing expenditure on African labour. To save costs, the management put emphasis on building grass-thatched huts for married labour. Such housing units cost very little and were without windows and with dirt floors and one room only. For single miners the RST erected forty-eight six-roomed barrack-like structures at a cost of £25.13.0 each.[86]

In spite of redundancies on the mine, this form of housing proved inadequate more so because those thrown out of work elected to stay in the compound with relatives still in employment. Overcrowding was thus commonplace and was instrumental in the spread of diseases of overcrowding, namely cerebro spinal meningitis and pneumonia in 1931. These two diseases exacted a heavy toll on African lives especially miners' children on whom there are no

records but whose susceptibility to diseases and epidemics during depression has been noted by Parpart.[87] At Roan the rate of death caused by these diseases was high enough to draw the attention of the Director of Medical Services. In a letter to the Secretary for Native Affairs in 1931, the Director noted that the high rates of mortality were due to pneumonia and meningitis.[88]

Like housing, sanitation received less attention from the management during the economic slump. It is true that during this period, the replacement of smoke pit latrines by communal water-borne latrines was under way. However, given the poor financial position of the mine the pace of replacement was too slow. For a labour force totalling 5,292 and twice that number in dependent population in 1931, there were only three small water-borne latrines with six holes each and three other bigger flushing latrines with six holes each. During the same period there were between thirty to forty smoke pit latrines with seven holes each.[89] Even when the fiscal position of the mine improved after the depression, there remained a large number of fuming latrines.

The gradual replacement of pit latrines by water sewerage did not in itself herald an end to intestinal diseases on the mine. Water-borne toilets had their own shortcomings which impinged on the health of miners and their dependants. Contrary to the recommendation by the colonial state that "sanitation policy should be aimed at family latrines, each family having its own latrine and the household having the entire responsibility for cleanliness and maintenance,"[90] the management at Luanshya found it cheaper to erect communal water-borne latrines at various points in the compound. These, as the Director of Medical Services observed in

1932, were "nobody's responsibility" and because of their limited number, were bound to be overcrowded and fouled.[91]

Hygienically, flushing latrines were not superior to smoke pit latrines. Not only were they badly built but the flushing system usually failed necessitating frequent alterations to the system by the Department of Engineering.[92] Further the new latrines were either without lights or dimly lit with low voltage "screw bulbs" even long after the depression.[93] As users of poorly illuminated and often fouled latrines feared to soil their feet at night, they found it more convenient to ease themselves in the bush or in neighbouring sanitary lanes or gardens.

The new form of sanitation thus brought no relief to diarrhoeal diseases at the Roan Antelope Mine. Like smoke pit latrines, flushing toilets greatly contributed to the outbreak of diarrhoeal epidemics between 1931 and 1933. Of these, the bacillary dysentery epidemic of 1934-35 caused most damage to the health of miners, their wives and children. The connection between this epidemic and flushing latrines was noted in 1935:

> I consider that the present condition of these [water borne] latrines is a menace to the health of the community and that it is a ... factor in the outbreak of dysentery which has occurred.[94]

The role of poor sanitation on the Roan Antelope Mine in promoting other diseases during the economic recession extended to hookworm infection which characterised the workforce and its dependent population throughout the depression period between 1931 and 1934. Nearly all African miners who reported for the monthly hookworm examination showed signs of infection. As this facility did not exist for women and their children it is not possible to estimate the impact of hookworm on them. But it can be safely said that this malady must have been commonplace among miners' wives and

children as they too lived in a faecally-contaminated compound. The extensive use of <u>umuti</u> (traditional herbs) among women and their children during the Great Depression suggests that this disease and other diseases must have been common.[95]

As in the case of housing and sanitation, the management reduced expenditure on feeding African labour during the depression. The quality of food thus deteriorated both in quality and quantity. Michael A Viljoen, a government health inspector who visited the mine in March 1931, found that rotten meat and sheep liver containing flukes were issued to miners. Such food was no doubt responsible for the prevalence of tropical ulcers on the mine.[96]

The quantity of food also reduced to a point that by the end of the Great Depression Africans on Roan Antelope Mine were living on "starvation level".[97] The dissatisfaction that insufficient food issues caused in the African community played a cardinal role in the 1935 strike on the mine. Relief from the poor and insufficient food rations and diseases associated with them could not come from the colonial state which legally was empowered to ensure that all mines observed minimum ration scales. In 1932 when the Luanshya Native Welfare Society eloquently complained about the inadequacy of food issues the response of the colonial government was that:

> If the natives in the Luanshya compound are unable to live on their wages and rations they receive from their employers they can always resign and return to their homes.[98]

The food crisis in the depression era was compounded by the lack of viable commercial and African peasant agriculture on the Copperbelt and in many other parts of the colony. Although the colonial state had been in power for seven years since taking over from the B.S.A. Company in 1924, it did little to stimulate African peasant

agriculture. In fact by passing certain pieces of legislation like the Native Reserve Ordinance of 1929, the state actually undermined peasant commodity production—a topic which has in recent years attracted much scholarly attention.[99]

In the absence of the required foodstuffs and state indifference to the problem of food, Africans at the Roan Antelope, like their counterparts in colonial Zimbabwe were compelled to "make massive investments in time, effort and cash to procure additional food" during the Great Depression.[100] Trading in fish became common in the compound and persisted throughout the colonial period. Miners travelled as far as Lake Bangweulu in the Northern Province and Lukanga swamps and Kafue River in Central Province to buy fish which they later sold in the compound.[101] Less enterprising miners resorted to deserting so that they could fish in the nearby Luanshya River.[102] Women also played a key role in procuring additional foodstuffs. They scoured the bush for frogs, mice, flying ants and bought quantities of fish, pumpkin leaves, cassava and other types of food from the company market. The depression in its wake also led to increased agricultural activity by women on company plots allocated to them. The sale by women of vegetables like tomatoes, green beans, onions, and maize to the administration expanded from the total weight of 40,000 pounds in March 1933 to 169,000 pounds by August the same year.[103]

By supplementing company rations married miners and their families managed to maintain themselves in relatively good health. Many visitors to the mine in the 1930s observed that married families were healthier and more contented than single labourers. Even the compound manager acknowledged that for every married worker admitted to hospital there were always two unmarried patients.[104]

The same lack of mine management concern for the health of the Africans in the period between 1931 and 1934 extended to matters of safety. As the company had no fear of losing labour from an increase in accident rates due to the labour glut engendered by the recession, it underemphasised safety measures.[105] Safety equipment like boots, hand gloves and other protective devices were not supplied partly because of management indifference and partly due to the high prices of these imported safety gadgets. Thus, as one ex-miner recalled:

> In the mines [Africans] were working without proper shoes. We used to wear shoes that looked rather like modern tropical sandals. Later we started to wear shoes which were called imikunki. The material at the bottom was a wooden plank and were covered on top with very tough leather and these shoes were extremely uncomfortable.[106]

Such type of footwear offered no protection against leg and foot accidents. In 1932 alone, foot and leg injuries accounted for 50 percent of all the accidents on the mine.[107] In the same year, the management established safety stations and began to sell boots to miners at a cost of 5 shillings a pair. Because of their poor wages, African workers were unwilling to purchase the boots even though the management awarded a bonus of 9 pence to a worker who bought and wore the boots throughout a given week.[108] The wearing of imikunki (shoes) which offered no protection to feet and legs thus continued.

The increase in accidents at the Roan Antelope Mine was further caused by indiscriminate use of explosives. Alone such accidents accounted for not less than a quarter of all fatal mishaps in the mining industry as a whole.[109] In order to raise production, it appears that the management at Roan allowed unlicensed Africans to handled explosives contrary to existing

regulations. The result was an unprecedented rise in the rate of accidental explosions most of which were fatal.[110]

Compensation for miners who suffered either partial or total disability as a result of accidents was kept to a minimum by the mine owners. As the Chairman of the Native Industrial Labour Advisory Board (NILAB) noted in 1935, this compensation did not take into account the cost of after-treatment or support for the disabled.[111] In conformity with their resolve to reduce expenditure on black labour the managers on the mine used the law which empowered them to fix compensation awards in consultation with district officers to poorly compensate Africans. Compensation awards were based on miners' earning capacity.[112] Since Africans were generally poorly paid this in effect meant that their compensation awards would be low. Disabled miners found life thus extremely difficult. They spent their compensation awards paid in lump sum too "quickly" and became destitute. This, in the opinion of the Chief Medical Officer at Roan, was responsible for their early death.[113]

Recovery and Improvement in Health Services 1935-1939

Most of the health problems dealt with so far were aggravated by deficient medical care. However, the end of the economic slump in 1934, marked the beginning of improvements in health services for African miners. With the increase in copper prices, the financial position of the Roan Antelope Mine began to improve. One year after the Great Depression, the mine even recorded its first dividends. As the financial position of the mine improved, the company increased its expenditure on the anti-malaria campaign from £543.3.9

in 1934 to £749.2.9 in 1935 and to £1,241.8.0 in 1938.[114] Further it erected a modern hundred and eighty bed hospital in the compound equipped with both diagnostic and therapeutic aids like X-Ray and Ultra-Violet plants, a diathermy machine, microscopes and surgical equipment.[115] By 1935, the African hospital had most of the equipment required in diagnosis and treatment of diseases.

Expenditure on hospital drugs, food for patients and department issues also generally improved even though it was, as Table II indicates, much lower than the management incurred in the provision of similar facilities at the European hospital. Expenditure on African hospital drugs and other functions rose from £49 in February 1934 to £66 in June the same year and to £80 in December 1935.

Table II: Expenditure on African and European Hospital Drugs, Food and Department Issues 1934-35.

MONTH	1934		1935	
	AFRICAN	EUROPEAN	AFRICAN	EUROPEAN
January	£34	£152	£69	£297
February	£32	£205	£49	£308
March	£58	£249	£55	£352
April	£38	£178	£57	£293
May	£59	£267	£44	£290
June	£74	£214	£66	£441
July	£55	£172	£64	£251
August	£71	£119	£83	£243
September	£46	£229	£91	£237
October	£72	£165	£47	£264
November	£60	£179	£66	£216
December	£36	£226	£80	£247

Source: Compiled from ZCCM/RACM WHC1-56: General Cost Sheets, Roan Antelope Mine, 1934-35.

The general improvement in health delivery on the mine was mainly designed to benefit African miners whose labour power was of direct value to production. For workers, therefore, drugs, hospital beds and vaccines were rendered available and this led to a

considerable drop in their mortality especially from killer diseases such as pneumonia, malaria and other diseases.

The mine management, however, hardly devised any policy on the hospitalisation of workers' wives and children. The management justified the absence of medical facilities for these two groups of people on the premise that where such facilities existed women and children shunned them. Yet as early as 1929-30 there was mounting evidence throughout colonial Zambia that Africans were increasingly accepting European medicines and even willing to undergo surgical operations with less aversion.[116] The lack of provision of medical services for women was thus a deliberate move by the RST not to incur expenditure on African mineworkers' families.

This stand, however, conflicted with the declared goal of the mine's management to keep the white community in good health. The presence on the mine of numerous unvaccinated African children and women posed a danger to the health of the European community. It is in this view that in the late 1930s the management initiated a welfare scheme half of whose cost was met by the colonial state and the other half by the mine itself.[117] Under this arrangement the latter agreed to render health services not only to miners' wives and children but also to African government employees and their families living at Luanshya.

The welfare scheme was a target of cost minimisation. Instead of building suitable structures in 1937 when the scheme began, the management merely converted two huts in the compound into a "maternity home" and welfare centre to exclusively cater for women and children.[118] The scheme further lacked attention from the management and initially largely depended on beer hall profits to which miners greatly contributed.[119]

At the end of the 1930s, the RST began to build clinics in the compound for women and children. Like the scheme, however, these clinics were dogged with indifference from the mine management. For many years following their inception, compound clinics at Roan lacked full-time attention of a medical doctor and were chiefly manned by under-qualified African medical orderlies and white nursing sisters.[120] Like at the African hospital in the compound, much of the work carried out at these clinics was more of curative rather than preventive nature. Emphasis on hospital-based medicine at the expense of the more costly preventive medicine provided no lasting solution to the ill-health of the African community. The ill-health in the African community manifested itself in abnormally high rate of sickness. In 1936, for example, the incidence of disease in the compound was as high as 235.69 per thousand.[121]

At the centre of such a high level of incidence and deaths which mostly claimed the lives of children were poor and overcrowded housing, insanitary conditions in the compound, and reluctance by mine management to improve diet for Africans and accidents. Overcrowding in the post-depression became endemic as the mine increased its labour force from 1936 onwards to meet production demands. But as the compound manager noted, this increase in labour was not accompanied by expansion in accommodation and this resulted in congestion particularly in the unmarried labour section.[122] This congestion was ideal for the spread of overcrowding-induced diseases like pneumonia, typhus, whooping cough and influenza and spelt disaster in times of epidemics.

The increase in compound population also exacerbated insanitary conditions. To accommodate the increasing labour force and compound population more smoke pit latrines were built in the

compound after the Great Depression even though it was now well established that these were health hazards.[123] During the same time, collection of rubbish from the compound deteriorated especially in rainy season when roads in the compound became impassable.[124] In such seasons garbage accumulated to such an extent that mine officials themselves acknowledged that it became "dangerous to natives".[125]

Given deteriorating insanitary conditions, the outbreak of diarrhoeal ailments in the African compound became rampant. In 1937-38 the compound witnessed a sharp outbreak of bacillary dysentery whose spread was facilitated by flies breeding in the uncollected refuse.[126] Another epidemic, the 1938 typhoid epidemic, had a more devastating effect: it killed at least three out of every four women and children it attacked and left seventy-one patients amongst miners themselves.[127]

As in most other matters pertinent to African health problems the management looked for cheap measures to combat diarrhoeal diseases. In the late 1930s, the compound administration intensified the spraying of pesticides on accumulated rubbish, a measure which proved in vain as it could not eradicate fly-breeding.[128] A more successful measure was the introduction of cinnamon in the treatment of faecally-related diseases especially dysentery in 1939.[129] Deaths from dysentery among miners' families declined in this way. Insanitary conditions, however, persisted and the incidence of the disease did not therefore subside.

The high rate of morbidity amongst Africans in the post-depression era must also be sought in the unwillingness of the mine management to ameliorate African diet. The management's resolve not

to improve diet on the mine became apparent in the late 1930s when the General Manager of the mine deplored the arrangement by the Maize Control Board whereby the mine purchased European grown maize at 11/6d each bag while the Board paid only 6.0d per bag to African farmers. The General Manager asked for a reduction in the cost of maize arguing that:

> We fully believe native maize is acceptable for native consumption and we would like the privilege of purchasing it at the differential of above its cost to which we pay in respect of European maize sold to you.[130]

In subsequent years, all food takings on the mine with the colonial state or any other food suppliers were underlined by this cost-saving approach. The most adversely affected were miners´ wives and children. The management ensured that it spent less on feeding the families of miners. In 1939, the managers at Luanshya only spent 2S.5d per month on feeding the miners´ wife or child while as much as 10S.8d was spent on feeding the worker himself with part of his food given to him at the place of work.[131] This move had both positive and negative consequences. It led to effective reproduction of physical labour manpower but undermined the health of the employees´ families especially children.

Finally, the high rate of morbidity among miners must be examined in terms of accidents which proliferated after the Great Depression. As industrial demand for copper in Europe increased after the slump, the Roan Antelope Mine increased its production. To meet labour requirements, the management lowered the physical health standards and began to use inexperienced African labour even in most dangerous operations.[132] Consequently serious accidents assumed high proportions standing at 148 in 1937, and 125 in 1938 while minor accidents expanded from 800 in 1937 to 1,166 in 1938.

During the same period, at least thirty African workers died of mining accidents on the mine.[133]

The Colonial State and African Mine Health Conditions

From the inception of mining activity at the Roan Antelope Mine, the Northern Rhodesia Government was aware of the poor health conditions under which Africans worked and lived. For example, during the Great Depression the Secretary for Native Affairs, J.M. Thompson, drew the attention of the Chief Secretary to the alarming rates of mortality and morbidity amongst Africans there:

> I would invite your attention to the very high death rate amongst native labourers at the Roan Antelope Mine.... It would appear that the death rate amongst mine workers was 70-75 per thousand and amongst natives employed as [mine] contractors 39-54. The incidence of sickness is also very high.[134]

Government officials were thus aware of the seriousness of the ill-health of the black community at Luanshya. Yet, although the state passed legislation to induce African labour into the copper industry and other capitalist interests, it hardly devised an effective machinery to monitor African health matters.

Elena Berger has eloquently argued that the state's failure to regulate labour conditions on the Copperbelt was due to its fiscal difficulties.[135] While this argument is tenable for the pre-depression period, and during the depression itself, it cannot account for why the state did not establish an effective institution to deal with conditions after the economic slump when government financial position began to improve. It took the 1935 African strike, largely caused by rudimentary conditions of service, for the colonial state to establish the Native Industrial Labour Bureau (NILAB) as a channel through which African labour conditions could

be dealt with. The state also raised Luanshya to a district status and increased the number of government officials near the mine. These two developments, however, led to little improvements in African health conditions. Not only was the NILAB dominated by representatives of mining capital but it lacked executive powers. It therefore could not ameliorate conditions and its role was chiefly an advisory one to the governor.[136]

On the other hand, although the new district status for Luanshya meant the presence of more government officials including a district commissioner near the mine, they had no voice in formulating policy on the mine about the running of the African mine compound. The position of the District Commissioner at Luanshya as late as the 1950s was aptly summed up by a mine official as "tolerated but not welcome" and the mine management tried to everything possible to "keep him out of the picture" on matters relating to miners' health and labour conditions.[137]

In practice, therefore, the colonial state left health issues in the hands of the profit-conscious management. The government itself mostly kept out of front line supervision on matters that required expenditure on African labour. Its own contribution in health delivery to Africans in the mining industry remained marginalised and drew sharp criticisms from some concerned members of the Legislative Council. Thus, in 1939 for example, A.A. Smith, member of the Nkana Electoral Area, in a motion in the Legislative Council criticised the inadequate participation of the government in the malaria combat on the Copperbelt and the territory as a whole. He challenged the state to take steps to increase and co-ordinate anti-malaria measures "and establish a malaria bureau in order to collate the knowledge of the disease, to advise as to the adequacy

of Public Health Act ... and to give advice". Not only was Smith ruthlessly attacked verbally by the Director of Medical Services, but he was forced to withdraw the motion.[138] Thus government contribution to the anti-malaria campaign at the Roan Mine remained at £180 per annum until 1939 when it was completely withdrawn from the Luanshya Management Board.[139]

Like elsewhere in colonial Africa, the colonial state in what was Northern Rhodesia, saw its role as that of providing cheap labour to the industry.[140] Separately, Simons and Parpart have rightly argued that the state's position and attitude towards the mining industry were underlined by the desire to ease primitive accumulation for capitalist interests and also the transfer of profits to the metropole.[141] The colonial state used its monopoly of power to create an enabling environment for foreign capital and making African labour cheap. Clearly one way of doing so was by delegating the provision of medical care, diet, housing, and sanitation to the cost-conscious management. In this way African labour was subordinated to capital and this had serious ramifications on the health of the black community at the Roan Antelope Mine and elsewhere on the Copperbelt.

After the 1935 strike in which six African miners were shot dead and more wounded at the Roan Antelope Mine, government attitude *vis-a-vis* African housing and other related health conditions became even more negative. The state began to oppose improvements in these conditions on the Copperbelt as this would lead to urbanisation, a phenomenon which conflicted with state policy of Indirect Rule.[142] Thus the drive to improve conditions to which diseases were inexonerably linked could not emanate from the colonial state.

Conclusion

To sum up, this chapter has attempted to reconstruct disease patterns and other health problems that characterised the formative years of the Roan Antelope Mine. It has tried to demonstrate that beside ecologically determined diseases, there were faecally-related and respiratory diseases like pneumonia which defective conditions on the mine promoted. In the first ten years these claimed a heavy toll of African lives. During the Great Depression health conditions worsened and so did the rates of mortality and morbidity in the African community on Roan Antelope Mine. The chapter has also noted that although hospitalisation generally improved after the depression, defective health conditions remained intact and therefore there was little improvement in the morbidity of the black mining community at Luanshya.

NOTES

1. Luchembe, "Finance Capital", p. 201.

2. ZCCM/RACM W(2) HA 64: Report on Conditions at Roan, Chambishi and Mufulira Mines by William Simpson, 6 January, 1930.

3. Northern Rhodesia, Medical Report on Health and Sanitary Conditions for the Year 1929 (London: Crown Agents, 1930), p. 20.

4. Malcom Watson, African Highway: The Battle for Health in Central Africa (London: John Murray, 1953), p. 13.

5. Cited in Watson, African Highway, p. 17.

6. Cited in Watson, African Highway, p. 19; See also L.M. Rodger, "The Development of Medical and Health Services at the Roan Antelope Mine, Part I", Northern Rhodesia Journal 5 (1962-64), p. 140.

7. See Watson, African Highway, p. 19.

8. ZCCM/RACM 10/8/2A/1: Report by Watson on his visit to Northern Rhodesia, 2 June 1930; See Watson, African Highway, p. 38.

9. ZCCM/RACM 10/8/2A/1: Report by Watson, 1930; L.H. Gann, A History of Northern Rhodesia: Early Days to 1953 (London: Chatto and Windus, 1964), p. 210.

10. Northern Rhodesia, Medical Report on Health and Sanitation Conditions for the Year 1927 (London: Crown Agents, 1928), p. 19.

11. ZCCM/RACM 10/8/2A/1: Report by Watson, 1930.

12. Charles Fisher, "40 Years of Medicine on the Copperbelt", Horizon 11 (12 December 1969), p. 5; RCM, Zambia´s Mining Industry: The First 50 Years (Ndola: Company Publication, 1978), p. 32.

13. D.D. Irwin, "Early Days on the Copperbelt", Northern Rhodesia Journal 1, 6 (1965), p. 113; See also Luchembe, "Finance Capital", p. 119.

14. Rodger, "Development", p. 136.

15. RACM, Zambia´s Mining, p. 32; Gann, A History, p. 210.

16. Spearpoint, "The African Native", pp. 5-7; See also J.E. "Chirupula" Stephenson, "The Luanshya Snake", Northern Rhodesia Journal 1, 5 (1965) p. 13; Fisher, "40 Years", p. 5; Berger, Labour, p. 13; Irwin, "Early Days", p. 113.

17. Spearpoint, "African Natives", p. 3; Berger, Labour, p. 13.

18. The Roan Antelope Recruitment Bureau carried out an extensive recruitment campaign in villages. It distributed pamphlets among villagers in which food and wages at Roan were exhorted. See NAZ/ZA1/9/18/1: Translation of information in attached notebook about work at Luanshya, 1929. For its part the colonial state

enacted pieces of legislation aimed at directing African labour to the mines. Among these included the creation of reserves in 1929 by which Africans were pushed from fertile land so as to undermine their productive capacity and hence push them into wage employment; the ban on recruitment of Africans by capitalist interests in South Africa, colonial Zimbabwe and Zaire; the introduction Vagrance and Native Registration Ordinances aimed at empowering mine owners to prosecute miners who deserted and binding them to their employers until the expiry of the contract. See Luchembe, "Finance Capital", p. 133; ZCCM/RACM/WMA 3: D.D. Irwin to London Office, 4 January 1930: NAZ/ZA1/9/18/1: Chief Secretary to Secretary for Native Affairs, 5 March, 1930.

19. See Luchembe, "Finance Capital", June Nash, We Eat the Mines and the Mines Eat Us: Dependency and Exploitation in Bolivian Tin Mines (New York: Columbia University Press, 1979).

20. ZCCM/RACM 10/8/2A/4: Report by M. Watson on his visit to Roan Antelope Mine, 1939.

21. Fisher, "40 Years", p. 5.

22. See Anonymous, "Guesthouse Triumvirate", Horizon, 1, 3 (March 1959), p.26; Luchembe, "Finance Capital", p. 259.

23. Stephenson, "Luanshya Snake", pp. 13-16; RCM, Zambia´s Mining, p. 32; Spearpoint, "African Natives", p. 6.

24. Spearpoint, "African Natives", p. 6.

25. Much of this information comes from Fisher, "40 Years", p. 5; RACM, Report of Directors with Balance Sheet at 30 June 1930; Northern Rhodesia, Medical Report on Health and Sanitation Conditions 1931 (London: Crown Agents 1932), pp. 24-25.

26. ZCCM/RACM 10/8/2A/1: Report on Second Meeting of the Ross Institute Industrial Anti-malaria Advisory Committee held in Central Chamber at Rubber Growers Association, 14 November 1929; Gann, A History, p. 210.

27. See Fisher, "40 Years", p. 6; Monica Fisher, Nswana, the Heir: Life and Times of Charles Fisher (Ndola: Mission Press, 1991), pp. 117-118.

28. See Fisher, "40 Years", p. 5.

29. See Fisher, "40 Years", p. 5.

30. See Fisher, "40 Years", p. 5.

31. See ZCCM/RACM 10/8/2A/2: African Employees, Contractors and dependants´ number of malaria cases, 8 August 1934.

32. See Charles Singer and E. Ashworth, A Short History of Medicine (Oxford: Clarendon Press, 1962), pp. 691-692.

33. Northern Rhodesia, Medical Report on Health and Sanitary Conditions for the Year 1925-1926 (London: Crown Agents, 1928), p. 29.

34. Samuel L. Andelman, The New Home Encyclopedia, Vol. 3 (New York: Quadrangle Books, 1973), p. 950.

35. Northern Rhodesia, Medical Report, 1927, p. 19.

36. Northern Rhodesia, Medical Report, 1927, p. 21.

37. See Watson, African Highway, p. 180.

38. Coulter, "Sociological Problem", p. 68; See also Northern Rhodesia, Labour Department Annual Report for the Year 1948 (Lusaka: Government Printer, 1949), p. 8.

39. ZCCM 15/1/3B: C.M. Peterson to Frank Ayer, 24 July 1934.

40. See ZCCM/RACM W(2) HA 64: Report on Conditions at Roan, 1930; Parpart, Labour, p. 41.

41. ZCCM/RACM W(2) HA 64: Report on Conditions at Roan, 1930; ZCCM/WMA 4: D.D Irwin to London Office, 25 October, 1930; Parpart, Labour, p. 41.

42. Northern Rhodesia, Medical Report, 1927, p. 17.

43. Benson Sampa, Senior Training Officer, Interview, Luanshya, 5 March 1992; Bonus Sitembeya, Cage Tender, Interview, Luanshya, 10 March 1992; A.R. Sokoloko, Mine Superintendent, Personal communication, Luanshya, 11 March 1992.

44. Watson, African Highway, p. 13; Irwin, "Early Days", p. 113-114.

45. ZCCM/WMA 1: D.D Irwin to RACM, London, 11 May 1929; Native Labour Association, 27 April 1929.

46. The New Encyclopedia Britannica Vol. 15, 15th Edition (Chicago: William Benton, 1983), p. 856.

47. NAZ/ZA1/9/28/1: E.H. Jalland to Frank Ayer, 9 August 1934; Watson, African Highway, p. 181.

48. See Coulter, "Sociological Problem", p. 68; ZCCM/RACM/0/8/4C: G.E. Mc Elory, Ventilation Engineer, Preliminary Report on Ventilation of Roan Antelope Mine, 19 February 1940; R.A. Flugge-de Smith, Preliminary Report on Ventilation, 26 July 1944; J.E. de Lambrects, Report on an Investigation on the Copper Mines and Broken Hill in Northern Rhodesia with Particular Reference to Silicosis (Lusaka: Government Printer, 1945), p. 13.

49. Charles Perrings, "Consciousness, Conflict and Proletarianisation: An Assessment of the 1935 Mine workers' Strike on the Northern Rhodesia Copperbelt", Journal of Southern African Studies 4, 1 (October 1977), p. 36.

50. See ZCCM/RACM W(2) HA 64: Report on the Conditions 1930; Fabian Chilufya, Mine Shaft Captain, Interview, Luanshya, 5 March 1992.

51. NAZ/SEC1/1295: Notes on a Meeting of the Acting Provincial Commissioner and the General Manager at the General Manager's Office, 20 September 1937; See for details on this issue, Meebelo, African Proletarians, p. 31.

52. See Watson, African Highway, p. 181; NAZ/ZA19/28/1: E.H. Jalland to Ayer, 9 August 1934.

53. Watson, African Highway, p. 181; Spearpoint. "African Native", p. 29.

54. Watson, African Highway, p. 181.

55. ZCCM/RACM WMA: D.D. Irwin to London Office, 20 September 1930.

56. Cited in Van Onselen and Phimister, Studies, p.122.

57. Watson, African Highway, p. 180; NAZ/SEC ZA1/9/28/1: Director of Medical Services to Secretary for Native Affairs, 22 April 1931.

58. See Watson, African Highway, p. 181.

59. Northern Rhodesia, Medical Report on Health and Sanitary Conditions, 1931, p. 16.

60. ZCCm 15/11/3B: Manager to General Manager, 7 February 1939.

61. Fisher, "40 Years", p. 6.

62. Northern Rhodesia, Medical Report on Health and Sanitary Conditions for the Year 1930 (London: Crown Agents, 1932), p. 29.

63. Kabole A. Chilindi, Ex-Medical Orderly, Interview, Luanshya, 12 March 1992; T. Mulasikwanda, Medical Doctor, Personal communication, Lusaka, 14 April 1992.

64. Irwin, "Early Years", p.113.

65. Watson, African Highway, p. 13; ZCCM/RACM W(2) HA 64: Report on Conditions, 1930.

66. ZCCM/RACM 10/8/2A/4: Report by Watson, 1939.

67. Northern Rhodesia, Medical Report on Health, 1930, p. 17.

68. See Spearpoint, "African Native", p. 25.

69. A Pearson and R. Mouchet, The Practical Hygiene of Native Compounds in Tropical Africa (London: Bailliere, Tindall and Cox, 1923), p. 52.

70. Northern Rhodesia, Medical Report, 1927; See also NAZ/ZA1/9/28/1: J.M Thompson to Chief Secretary, 26 August 1929.

71. See ZCCM/RACM 10/8/2A/1: Health Suggest, March 1930.

72. A.L. Epstein, Politics, pp. 14-17; Spearpoint, "African Native", p. 18.

73. ZCCM/RACM W(2) HA 62: Report by Orestein, 1929.

74. ZCCM/RACM 10/7/10C/2: W. Simpson to Evans, 12 November 1929; See also ZCCM/RACM 11/3/4F/1: Concentrator Superintendent to W. Mackenzie, Manager, 9 November 1939.

75. ZCCM/RACM 10/8/2A/1: Report by Watson, 1930.

76. See Spearpoint, "African Native", p. 28.

77. Benjamin Silavwe, former nurse, Interview, Luanshya, 7 March 1992; Kabole Chilindi, Interview.

78. Spearpoint, "African Native", p. 28.

79. Gann. Central Africa, p. 112.

80. RCM, Zambia's Mining, p. 33.

81. Cited in RCM, Zambia's Mining, pp. 33-24.

82. Luchembe, "Finance Capital", p. 185.

83. Northern Rhodesia, Report of Government Unemployment Committee, (Livingstone: Government Printer, 1932), p. 9.

84. Cited in James Ferguson, "Mobile Workers, Modernist Natives: A Critique of the Historiography of Transition on the Zambian Copperbelt", Journal of Southern African Studies 16, 3 (September 1990), p. 398.

85. In 1931 the death rate of African miners at Roan was 17 per thousand on the gold mines in South Africa and 8.01 per thousand on Katanga mines. See Coulter, "Sociological Problems", pp. 66-67.

86. ZCCM/RACM 10/8/2B/1: Frank Ayer to H.T. Dickson, Consulting Engineer, Johannesburg, 27 May 1933.

87. Parpart, Labour, p. 49.

88. NAZ/ZA1/9/28/9: Director of Medical Services to Secretary for Native Affairs, 22 April 1931; See also Northern Rhodesia, Department of Native Affairs Annual Report for the Year 1931, (Livingstone: Government Printer 1932), p. 35.

89. ZCCM/RACM 11/3/4F/1: Compound and General Inspection, 5-7 March 1931.

90. NAZ/ZA1/9/28/1: Director of Medical Services to Chief Secretary, 13 December 1932.

91. Ibid..

92. Spearpoint, "African Native", p. 25.

93. ZCCM 15/1/3B Chief Medical Officer, Memo to Acting General Manager, 30 July 1936; ZCCM/RACM 10/8/2B/2: Notes taken on a visit of African Housing Commission, 7 July 1944; NAZ/SEC1/1338: Luanshya Report, July 1944; F.W Jameson, Report on African Housing in Urban and Rural Areas (South Africa: Northern Housing and Planning Commission, 1945), p. 8.

94. ZCCM 15/1/3B: Chief Medical Officer to General Manager, 20 November 1935.

95. Both the Compound Manager and Charles Coulter noted that there was extensive reliance by children and women on herbs in the early 1930s. See ZCCM/RACM 10/7/10C/2: C.F. Spearpoint, Compound Monthly Report, 31 January 1932; Coulter, "Sociological Problems", p. 69.

96. Northern Rhodesia, Department of Native Affairs Report, 1931 (Livingstone: Government Printer, 1932), p. 35.

97. Ian Henderson, "The Copperbelt Disturbances of 1935 and 1940", Seminar Paper, University of Zambia, May 1969, p. 2.

98. NAZ/ZA1/9/82/8: J.M. Thompson, Secretary for Native Affairs to Chief Secretary, 6 January 1932.

99. See for example, J.C. Momba, "The State, Peasant Differentiation and Rural Class Formation in Zambia: A Case Study of Mazabuka and Monze Districts", (Ph.D. Thesis: University of Toronto, 1982), pp. 92-118; Maud Muntemba, "Thwarted Development: A Case Study of Economic Change in the Kabwe Rural District of Zambia", in Robin Palmer and Neil Parsons, (eds), The Roots of Rural Poverty in Central Africa (London: Heinemann, 1977), pp. 351-361; Samuel N. Chipungu, The State, Technology and Peasant Differentiation in Zambia: A Case Study of the Southern Province 1930-1986 (Lusaka: Historical Association of Zambia, 1988), pp. 34-55.

100. Cited from Van Onselen, Chibaro, p. 45.

101. Kabole Chilindi, Interview; see also W.V. Brelsford, Copperbelt Markets (Lusaka: Government Printer, 1947), pp. 68-80.

102. See Spearpoint, "African Native", p. 28.

103. ZCCM/RACM 10/8/2B/1: Frank Ayer to H.T. Dickson, 27 March 1933; NAZ/ZA1/9/18/1: C.F. Spearpoint to F.Ayer, 28 April 1933.

104. See Spearpoint, "African Native", p. 18.

105. See Parpart, Labour, p. 49.

106. UNZA, Joint Oral History Project, Man/27, 1974; Perrings, "Consciousness", pp. 40-41.

107. ZCCM/RACM 10/2/10C/2: Spearpoint, Compound Monthly Report, 31 May 1932; See also Northern Rhodesia, Medical Report on Health and Sanitary Conditions for the Year 1932 (London: Crown Agents 1933), p. 19.

108. ZCCM/RACM 10/2/2/10C/2: Compound Monthly Report, May 1932.

109. See E.A.G. Robinson, "The Economic Problem", in Davis (ed.) Modern Industry, p. 167.

110. ZCCM 15/1/3B: Report of Mines Department for the Year Ending 31 December 1931.

111. NAZ/SEC1/1327: Chairman's Report on the Meeting of the NILAB, 17 December 1935; See also Report of the Sub-Committee of NILAB, 1936; Northern Rhodesia, Sub-Committee of NILAB (Lusaka: Government Printer, 1936), p. 7.

112. Coulter, "Sociological Problem", p. 69.

113. ZCCM 15/1/3B: A.C. Fisher, Memo to Manager, 17 March 1938.

114. See Watson, African Highway, p. 90.

115. Rodger, "Development", p. 140; See also, Watson, African Highway, pp. 17-19.

116. See Northern Rhodesia, Department of Native Affairs Annual Report for the Year 1929 (Livingstone: Government Printer), p. 19; NAZ/ZA1/1/9/28/1: J.M. Thompson to Chief Secretary, 1 May 1930.

117. Rodger, "Development", p. 136; Watson, African Highway, p. 90.

118. Rodger, "Development", pp. 251-252.

119. Watson, African Highway, p. 112.

120. Kabole Chilindi, Interview; M. Sakala, former male nurse, Interview, Luanshya, 8 March 1992.

121. ZCCm 15/1/3B: A.C. Fisher to General Manager, 20 January 1938.

122. ZCCM/RACM 10/8/2B/1: Spearpoint to F. Ayer, 22 July 1937.

123. ZCCM/RACM 10/7/10C/2: Compound Monthly Report, 31 October 1938.

124. ZCCM/RACM 10/7/10C/2: Compound Monthly Report, 31 March 1939.

125. Ibid..

126. ZCCM/RACM 10/8/2B/3: Report by M. Watson on his visit to Roan Antelope Mine, 1939.

127. Ibid.. Kabole Chilindi, Interview.

128. ZCCM/RACM 10/7/10C/2: Compound Report, 31 March 1939.

129. See ZCCM 15/1/3B: Frank Ayer to Director of Medical Services, Fiji, 24 November 1939.

130. NAZ/SEC1/69: Frank Ayer to Secretary, Maize Control Board, 9 May 1939; Also in Kenneth P. Vickery, "Saving Settlers: Maize Control in Northern Rhodesia", Journal of Southern African Studies 11, 1 (April 1985), pp. 212-234.

131. See Chauncey, "Locus", p. 139; Spearpoint, "African Native", p. 28.

132. ZCCM 15/1/3B: Frank Ayer to Commissioner of Miners, Ndola, 27 August 1938.

133. Accident statistics derive from Northern Rhodesia, Medical Report on Health and Sanitary Conditions for the Years 1937, 1938 and 1939.

134. NAZ/ZA1/928/1: J.M. Thompson to Chief Secretary, 23 October 1930.

135. Berger, Labour, p. 8.

136. NAZ/SEC1/1326: Governor Hubert Young to Malcom MacDonald, Colonial Office, London, 29 August 1935.

137. Epstein, Politics, p. 246.

138. Northern Rhodesia, Legislative Council Debates: Third Session of the Sixth Council, 20 May-5 June 1939 (Lusaka: Government Printer 1939), pp. 346-359.

139. See ZCCM 11/4/1C/31: M.H. Webster, Director of Medical Services to Secretary, NRCM, 1 June 1959.

140. For details on the colonial state in Africa, see John Lonsdale and B. Berman, "Coping with Contradictions: the Development of the Colonial State in Kenya 1894-1914", Journal of African History 20, 4 (1979); Kenneth Good, :Settler Colonialism: Economic Development and Class Formation", Journal of Modern African Studies 14, 4 (1976).

141. J.H. Simons, "Zambia's Urban Situation", in Ben Turok (ed.), Development in Zambia (London: Zed Press 1979), p. 5; Parpart, Labour.

142. For details on Indirect Rule see Kusum Datta, "The Policy of Indirect Rule in Northern Rhodesia (Zambia), 1924-1953", Ph.D. Thesis: University of London, 1976.

CHAPTER TWO

IMPACT OF THE SECOND WORLD WAR, 1939-1945

The Second World War had far reaching ramifications on the health of African miners and their families. This chapter seeks to demonstrate that the war played a key role in the epidemiological changes that occurred at the Roan Antelope Mine between 1939 and 1945. The chapter basically argues that the phenomenal expansion in copper production necessitated by the conflict in Europe led to the emergence of pathological diseases notably silicosis and tuberculosis and also other occupational ailments. The increase in production also created an ideal environment for accidents and white-on-black violence both of which constituted a serious affront to the physical well-being of the black mine workers.

The chapter further notes that the Second World War acted as a catalyst in the deterioration of health conditions such as housing, sanitation and diet. Such health problems like typhoid and typhus epidemics of 1941-1943 and deficiency diseases like kwashiorkor and marasmus were in essence products of deterioration in living conditions during the war. In seeking to grasp the interrelationship between the war and disease, the chapter firstly examines the extent the production of copper at Roan Mine reached in the context of state and management policies relating to the war.

The policy of the colonial state between 1939 and 1945 was shaped by the conflict in Europe and the value of copper to Britain and her Allies. As a base metal, copper was regarded by both the state and Colonial Office in London as an essential war material. Thus early in the war, the Colonial Office instructed Governor John Maybin to do everything possible to intensify copper production even

if this meant resorting to over-working the miners on the Copperbelt.[1] In response, the Northern Rhodesia Government formulated a policy in line with instructions from London to increase copper production. Addressing the Legislative Council in June 1940, Governor Maybin argued that state policy was:

> to increase the output of base metals as an economic contribution to the general war effort. This economic contribution was considered by the Home Government [in Britain] and ourselves as the most valuable aid we could give to the empire.[2]

Throughout the war government decisions relating to African labour in the mining industry were guided by this policy and the desire to help companies maximise production.

For its part, the Rhodesian Selection Trust entered into an agreement with the British Ministry of Supply by which the Roan Antelope Mine was obliged to supply long blister copper to Britain alone.[3] Encouraged by attractive copper prices induced by the Second World War, the mine management expanded production to a phenomenal level so that by June 1945 the Roan Antelope Mine alone sold as much as 363,694 tons of long blister copper to the British Ministry of Supply.[4] It is in the light of this enormous increase in production and all that it entailed that health problems and diseases that plagued miners and their families during the war should be examined.

Pathological Diseases

The expansion in production of copper played an instrumental role in the emergence of pneumoconiotic ailments at Luanshya in particular and in the mining industry in general.[5] Of such pathological diseases, the most important was silicosis. Caused by

inhalation of fine dust particles which contain silica, this disease is:

> Characterised anatomically by generalised fibrotic changes and the development of military nodulation in both lungs, and clinically by shortages of breath, decreased chest expansion, lessened capacity for work, absence of fever, increased susceptibility to tuberculosis and characteristic X-ray findings.[6]

At Luanshya, silicosis was first suspected in the early 1930s but all the early cases of the disease could be traced to South Africa were those found with the ailment worked prior to their engagement at Roan. Also, Frank Ayer, then General Manager on the mine, who knew how costly industrial disease legislation could be to mining capital, kept the suspicion of silicosis and tuberculosis as a mine secret from the colonial administration, arguing that:

> I think it is very important that we sit tight and watch the situation, but never have a meeting or publish or say anything which in any way admits that any of our workmen are subjected to silicosis.[7]

In line with this policy, Frank Ayer sent the Inspector of Mines rock samples which were "principally shale" when the latter asked him in the early 1930s to furnish him with samples in order to investigate the danger of silicosis on the Roan Antelope Mine. In this way, Ayer minimised the risk of giving away the secret. In his own words, by sending the shale samples, it was "doubtful if government will find anything alarming as far as Roan is concerned".[8] Ayer's position on silicosis was endorsed by the RST Head Office in London and when the sample of rocks were examined by the Inspector of Mines no danger of silicosis was discovered.[9]

After the outbreak of the Second World War the belief that silicosis was not being contracted in the mine and Ayer's resolve to "sit tight and watch the situation" were broken. The increase in lashing, drilling and crushing of ore heightened the level of dust

on the mine and thus raised miners´ risk of succumbing to silicosis. Other important sources of silicosis-inducing agents were primary and secondary blasting which increased partly because of the higher demand for copper and also partly because of the nature of the ore body at Luanshya.[10] An expert in industrial dust and mining ventilation who visited the mine during the war observed that blasting constituted a prolific source of harmful dust. He further noted that the danger of getting the disease at Roan was raised by the fact that Africans were made to work in dust-ridden areas soon after secondary blasting. The expert, additionally, observed that miners could also contract the disease in surface occupations in the smelter, concentrator, crusher stations and the coal pulverising plant as the level of dust there was quite considerable.[11]

The risk of contracting silicosis was compounded by poor ventilation which meant that dust could not be effectively removed from the mine. As indicated in chapter 1, the flow of air underground was sluggish because the system of ventilation at Roan was designed for shallow depths but was very impractical at great depths.[12] Under such conditions, cases of silicosis proliferated on the mine much to the surprise of Africans who, coming from peasant societies, had no experience of any industrial ailment. An ex-miner recalled that:

> Filicoshishi [e.i. silicosis] took all of us by surprise. Old miners were particularly susceptible to it especially those employed in underground work. Once contracted, this strange disease incapacitated its victim quickly. He could hardly breathe and quite often the victim died within one or two years following the contraction of the disease.[13]

The information that underground miners were more prone to silicosis than surface workers was corroborated by several respondents. They singled out lashers and drillers as the most vulnerable group.[14]

As the Second World War promoted heavy lashing and drilling, there can be no doubt that these workers carried out their operations in most dust-ridden conditions and thus easily succumbed to silicosis.

Silicosis statistics for the war period are erratic. Until after the war, there existed no effective machinery at Roan for identifying Africans who fell prey to the disease; nor do existing figures of African silicosis represent those in whom silicosis manifested itself after they left employment.[15] These limitations notwithstanding, it is clear that by 1944 "several Africans" were suffering from silicosis at Luanshya, and, out of the examined 853 Africans in the copper industry as a whole with no mining experience outside colonial Zambia, a good number had succumbed to silicosis and tuberculosis by 1945.[16]

Silicosis is incurable. It thus had to be confronted from a preventive view point. But by the time the war broke out in Europe, neither the Northern Rhodesia Government nor the management had put in place any silicosis preventive measures. However, by 1939, there was mounting pressure from the Colonial Office on the Northern Rhodesia Government to enact industrial diseases legislation and compensation of miners who contracted such diseases. This pressure arose out of the need by the British government to avoid the South African experience whereby British miners who worked there before industrial legislation was passed returned to England with broken health and without compensation and thus became a fiscal liability to the government.[17]

It was because of this pressure that a debate in the Northern Rhodesia Legislative Council in 1939 led to the appointment of the Industrial Diseases Committee to gather data on silicosis and other related diseases. Such data was scrutinised by Dr. L.G. Irvine, a

South African industrial disease expert, then the Chairman of Miners' Phthisis Bureau of South Africa.[18] Irvine confirmed that the danger of silicosis existed on the mines on the Copperbelt. He further noted that the risk of the disease at the Roan Antelope Mine was very high as there was 15 percent of the free silica in 97 percent of the mining operations on the mine.[19]

Irvine's discoveries led to the appointment of various committees by the colonial state some of which looked into prevention of silicosis and compensation for silicotics.[20] Consequently, the Silicosis (Temporary Arrangement) Ordinance was passed in 1945 and, under it Mining (Prevention of Silicosis) Regulations were promulgated in 1946. Henceforth the Roan Antelope Mine and other mines were obliged in 1946 to instal underground additional fans, enlarge and extend airways and increase return airways.[21]

Under the Silicosis (Temporary Arrangement) Ordinance, all the mines were obliged to compensate African silicotics in accordance with the Workmen's Compensation Law. Practically, however, most Africans whose health was broken by silicosis were merely repatriated in keeping with management policy of reducing expenditure on African labour. Those who were compensated were usually given meagre awards—a practice which excited a lot of criticism from the Boss Boys Committee at Luanshya. After 1943, this committee began to make "persistent and specific demands to make reforms in the areas such as pneumoconiotic control, rejecting company practice of discharging silicotics and demanding that light work be provided".[22]

Towards the end of the Second World War, mining companies through the chamber of mines began to press for a form of industrial

legislation similar to the one which obtained in South Africa. The chamber of mines, which was formed in 1941 to encourage co-operation between mining interests in the colony, also began to insist that permanent industrial disease legislation should only be put in place two years after the conflict with Germany.[23] Such demands attracted a lot of criticism from Africans and whites alike. In a letter to the editor of Northern News, J.F.C.P. Murray, a white miner, convincingly argued in 1945 that the demand by the Northern Rhodesia chamber of mines (NRCM) to tailor permanent industrial disease legislation after the South Africa patterns was calculated to pay inadequate compensation to victims of occupational diseases.[24] For their part, Africans at the Roan Antelope Mine fought for a fair legislation on compensation for silicotics but "lost the battle because when such legislation was passed after the war white miners´ demands were met but ours (i.e. African demands) were overlooked. We continued to receive inadequate compensation while a lot of African silicotics were merely repatriated to their villages without any compensation at all".[25]

While silicosis attracted so much attention from the Colonial Office in London, the Northern Rhodesia Government and also from mine workers themselves, little attention was paid to other industrial diseases pathological or structural in nature. Tuberculosis was one of these. Miners who contracted silicosis also easily succumbed to infection by tubercle bacillus, the bacteria that causes tuberculosis.[26] Although tuberculosis at Luanshya received minor attention, it was as harmful as silicosis. Miners who contracted tuberculosis did not usually live for "more than a maximum of two years".[27] By the early 1940s, there was increasing evidence in the rise of African tuberculotics on the mine and there

was an urgent need to redress the situation at Luanshya and other mines where tuberculosis also took an upward trend.[28]

The need to redress the tuberculosis situation was in fact a pressing matter that drew little attention from the Northern Rhodesia Government and the mine managements for many years. At the Roan Antelope, there was no control measure for many years; neither was there any organised treatment for African tuberculotics. While management in collaboration with the state ensured that white tuberculotics were sent to South Africa and, later during the Federation, to colonial Zimbabwe for treatment, Africans were sent to Ndola for treatment for few days only after which they were repatriated to their villages.[29] This undoubtedly must have led to the spread of tuberculosis in the countryside.

Unlike silicosis which many informants described as "the disease of the miners" tuberculosis was not confined to workers alone. In the absence of prophylactic measures against this scourge such as nourishing diet, properly ventilated housing and avoidance of overcrowding, the diseases rapidly spread to miners' children and wives. The rapid spread of tuberculosis was complicated when African soldiers who had seen service in the Middle East introduced a more deadly and resistant strain of tuberculosis at Luanshya.[30] Children and infants whose immunity was naturally lower suffered most from the disease. A former nurse at the African hospital on the mine remembered that in households of ex-servicemen who had tuberculosis at least two or three infants or children suffered from the disease. The nurse also relived that tuberculosis was virtually absent among white workers and their families.[31]

At Luanshya, the prevalence of tuberculosis was a good measure of what Mereth Turshen calls "societal ills".[32] The low incidence

of tuberculosis among white families and, after the war, as chapter III suggests, among the new African middle class on the mine. reflects the social inequalities that existed there. Tuberculosis was an evidence of the disregard of the mine owners in providing Africans with the necessary preventive and curative care required of the disease.

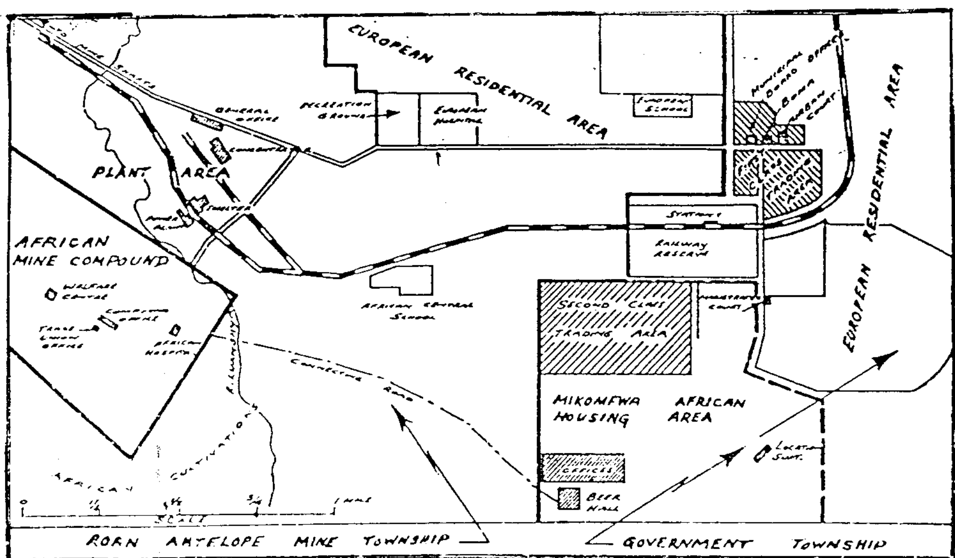
Other Occupational Health Problems

In addition to silicosis and tuberculosis there were other health disabilities which the expansion in mining activities at the Roan Antelope Mine promoted. These included cases of conjunctivitis generally caused by lack of safety devices for eyes; paralysis in legs and arms engendered by heavy lashing and drilling; loss of voice and hearing as a result of the high level of noise in areas like the smelter and concentrator where only sign language was the medium of communication; and also other disabilities whose symptoms included insomnia, coated tongues, depressive insanity, general fatigue and palpation all of which were probably induced by poisoning.[33] There were also several cases of dermatitis and respiratory irritations caused by massive handling of chemicals but which, like tuberculosis, were not compensable and thus were widely discussed among black and white miners alike.

To these occupational health disabilities should be added chronic and asthmatic bronchitis. Evidently, bronchitis was induced in Africans by increase in fumes from the plant area. The rise in cases related to bronchitis was facilitated by the proximity of the African compound to the plant area. The siting of the African compound was done with little regard to the health of the occupants

and closely resembles the siting of the housing units of British industrial workers in the eighteen century which conjures up a "visual image which forces one to think first of the industry and only secondly the people connected with it".[34] As Map IV indicates, the African compound, unlike the European mine township, was situated very close to the plant area. Thus harmful fumes from the concentrator and smelter could be easily inhaled and these were instrumental in causing broncho-related ailments and ultimately in turning the compound and surrounding areas into a lunar landscape. Mostly Africans succumbed to bronchitis in cold winters when the atmosphere in the compound was laden with fumes and dust.[35]

Map 4: Proximity of African Compound to Plant Area



Source: Epstein, Politics, p.7.

Accidents and Assaults

The health hazards the Second World War promoted and aggravated were compounded by mining accidents and white-on-black violence. Together accidents and assaults on blacks by their white counterparts posed a serious threat to the physical well-being of the victims. The rise in accidents and assaults on the mine in the war period must be sought in the framework of the imperatives of capitalist accumulation which promoted increased pressure on shift work, overtime and use of dangerous chemicals.

The main factor behind the numerous accidents at Luanshya between 1939 and 1945 was increased pressure on production. To increase output, the management began to circumvent some mining regulations. African workers complained before a visiting labour officer, "labourers were made to go into dangerous places and on refusal were discharged".[36] This practice of compelling Africans to work in dangerous places which included unsurveyed and fume-laden areas and abandoned workings which were not fenced across the width accounted for many accidents which occurred on the mine.

Another important cause of accidents was the over-bearing nature of gangers. In their hurry to meet production targets, gangers forced Africans to work in hurried manner. As the Compound Manager at Roan Antelope Mine noted in 1942:

> Many accidents are caused by Europeans who impatiently urge natives to hurry up whilst they are performing some job and the new boys particularly are liable through this to do something wrong.[37]

Indeed, new miners were particularly prone to accidents. This was worsened by the fact that their physical fitness demanded by medical examination was lowered to increase labour and, lacking mining experience, they inadvertently went into dangerous places. Out of

every ten new labourers at least three or four miners met their death in this way.[38]

Like in the Great Depression era of the 1930s, the massive handling of explosives during the Second World War also led to fatal accidents. Of the seventeen and 310 Africans who were killed and seriously injured in accidents respectively, on the mine in 1944, the majority of them met their fate due to explosives.[39] The scarcity of rubber material brought about by the Second World War also greatly contributed to accidents involving legs and fingers. Most of these accidents occurred on the surface where workers generally did not wear protective devices. Writing to the mine manager at Roan, the Chief Inspector of Mines in 1944 instructed the former to look into the issue of providing boots and gloves as a way of minimising accidents on the surface.[40] Little effort was however made and the management apparently capitalised on the scarcity of rubber materials to justify the lack of boots and gloves for African miners on the surface. Thus miners continued to lose their limbs.

Victims of accidents during the war found life hard because of the meagre compensation the management awarded them. The amount awarded continued to be pegged to the earning capacity of Africans which was generally very low. In effect this meant that compensation awards were reduced to a minimum. For example, a miner earning £1 annually in the 1940s received only £4 after losing his limbs.[41] Attempts by T.F. Sandford and Gore-Browne, both of whom represented African interests in the Legislative Council to put an end to this injustice by introducing payment of pensions to Africans who left employment due to partial or total disability caused by accidents went unheeded by the profit-conscious mining companies.[42]

At the Roan Antelope Mine, accidents and assaults increased to a level that they began to threaten production itself. In fear of accidents, assaults and rigorous manual labour large numbers of African miners began to desert in spite of Emergency Powers Regulations enacted by the Northern Rhodesia Government to tie Africans to their employers during the war.[43] Desertions among surface miners rose from about 166 in 1939 to 252 in 1944 and from 257 in 1942 to 272 in 1945. Most of the desertions, however, took place amongst underground employees jumping from 305 in 1939 to 549 in 1940 to 493 in 1941 and to 931 in 1944.[44] It was indeed underground where most of the accidents and assaults occurred.

The desertion of labour from employment called for much attention from the Government and the mine owners. It was in this manner that the state and Chamber of Mines formed a Joint Safety Committee on all the copper mines in the early 1940s to study accidents statistics, safety measures, train Africans in safety and to start safety refresher courses. Under its committee the Roan Antelope Mine and other mines began to participate in yearly inter-departmental and inter-mine First Aid Competitions all aimed at reducing mining accidents.[45] Mining accidents consequently were considerably reduced. After 1945 accidents as a cause of desertion were negligible and this was evidenced by the dramatic drop in desertion among underground miners.[46]

It is clear from the foregoing that mining accidents received much attention from the management and state because they threatened production. Physical assaults on Africans did not get as much attention. Increased production pressure created a rise in tension between African and European miners which found expression in white-on-black violence.[47] At the Roan Antelope Mine, this violence was

a manifestation of the growing fears of job competition among white miners as Africans became more proletarianised and began to demand for equal job opportunities. In the majority of cases, assaults were committed by unskilled or semi-skilled miners from South Africa over whom the management exercised very little control.[48] At the same time there was "real understanding between skilled Europeans and black workers" as the former had nothing to fear in terms of job competition with Africans.[49]

Tension created by expansion in copper production coupled with the growing fear of loss of jobs by unskilled whites illustrated itself in numerous instances of verbal and physical assaults on blacks. African miners were degraded, jeered at and called dogs or monkeys or "people without sense".[50] As Table III indicates, physical assaults also proliferated during the Second World War jumping from 19 cases in 1939 to 47 in 1941 and 104 in 1944.

Table III: Estimated Cases of Assaults on Africans by Whites at Luanshya Mine 1939-1950

YEAR	ESTIMATED NUMBER OF ASSAULTS
1939	19
1940	45
1941	47
1942	75
1943	54
1944	104
1945	83
1946	78
1947	195
1948	113
1949	191
1950	106

Source: Compiled by the author from ZCCM/RACM WMA 17/18/19: Assault Cases at Roan Antelope Mine, 1939-1950.

These estimates underestimate the gravity of the problem of violence on the mine under probe. Many accidents which took place during night shifts never reached the compound office where cases of assault were recorded. The problem of assault seems to have been fuelled by two important factors. Firstly, there was no effective vehicle of communication between whites and blacks. The management encouraged the speaking of a mine lingua franca called Chilapalapa, or Chikabanga whose place and date of origin have remained obscure to this day. This lingua franca lacked the finer gradations of intercourse as it was "minimally Bantu in grammatical structure" and heavily drew from languages as diverse as English, Zulu, Xhosa and Afrikaans spoken in South Africa, Nyanja and Bemba spoken in colonial Zambia and Sindebele in what was Southern Rhodesia.[51] Given this form of medium of communication, there were numerous misunderstandings and little communication between whites and blacks. Raw recruits from villages hardly understood instructions uttered in Chikabanga. Failure to carry out such instructions was punished by belting.[52]

Secondly, racial prejudices fuelled racial tensions between African and White miners. As Jane Parpart and Leroy Vail have separately argued, white miners, most of whom came from South Africa, planted on the Copperbelt that country's race attitudes towards blacks.[53] It was believed that Africans were sub-human and could only be productive if subjected to some form of military action or physical assaults. As an ex-miner remembered "beating us [black miners] was one way of goading us to work hard and produce much copper".[54]

Assaults seriously hampered the physical wellbeing of Africans. In assaulting blacks, whites used sticks, rocks, spades,

blows, or "anything within their reach".[55] Immediate causes of assaults included muttering, loafing, malingering, refusal to work in fume-ridden places and, as seen earlier, failure to carry out instructions by white gangers. In many instances, assaults led to serious injuries warranting admission to hospital for several days.[56]

To some extent the proliferation in violence on the mine may be blamed on management and state indifference to the problem. There existed no satisfactory means of curbing violence—a point which J.H. Walace, a government official, brought to the attention of the Secretary of the NRCM in 1943.[57]

State legislation during the Second World War also hardly provided any solution to white-on-black violent acts. Under the Emergency Powers Regulations the only channel through which blacks could complain was the tribunal comprising several white government officials who obviously never lived on or near the mine.[58] It thus took a long time to deal with cases of assault and this encouraged white employees to inflict assaults on their black counterparts. When labour officers visited the mine in the 1940s the most "too common complaint" by African miners was against Europeans who frequently assaulted black employees.[59]

The fact that the mine management and government did nothing to curb acts of violence against Africans, suggests that mining capital with state collaboration helped in institutionalising violence at Roan. Clearly, violence did not threaten production but rather increased it. In this way, no serious attempt was made to redress the situation until after the Second World War. Until then Roan Antelope Mine could be, as one mine superintendent argued, likened to a military camp where white gangers acted like corporals

in beating Africans with the support of senior mine officials.[60] Neither the state nor the management had an answer to the degrading behaviour blacks were subjected to. Indeed, when Africans complained to the mine management about verbal or physical assaults, they risked losing jobs as white provocateurs were always credited with telling the truth in matters concerning attacks on African miners.[61]

In the absence of redress of violence, Africans resorted to the use of umuti (traditional herbs) believed to provide immunity from the violence of white workers. As Chipasha Luchembe argues, these herbs "were believed to charm the wrath of European supervisors, disarm their violence and thereby protect the fortunate miner or bestow upon the miner the enviable status of the preferred `boy´".[62] Umuti came from miners´ relatives in villages or was imported through the postal system from as far as South Africa, or from ing´anga (African traditional healers).[63] The trouble taken to procure medicinal herbs, some of which were rubbed on the body before reporting for work, illustrates how serious white-on-black violence was at the Roan Antelope Mine. It is difficult, however, to assess how effective herbs were in stemming violence. Informants interviewed on the subject had conflicting views. Some maintained that miners who used herbs were immune from assaults, while others asserted that umuti provided no immunity of any kind. Statistical evidence seems to agree with the latter though it is not possible to tell whether those assaulted used herbs or otherwise.

War and Health Conditions

With the exception of tuberculosis, the pattern of diseases and other health problems dealt with so far affected the miner himself. The Second World War, it should be noted, also acted as a catalyst in the deterioration of African housing, compound sanitation and diet. In the wake of such deterioration the incidence of disease afflicting not only miners but also their families took an upswing thrust in the compound.

The Second World War led to a serious deterioration in housing in two main ways. Firstly, the conflict in Europe led to a critical shortage of building materials. The building industry itself was threatened with collapse and procurement of African labour by Roan Antelope Mine building contractors became doubly difficult even though contractors paid higher salaries than the mine.[64] Secondly, in its pre-occupation with raising production during the war, the management at Roan delayed the construction of two-roomed houses for Africans on the premise that the Head Office in London did not sent its approval for erecting such houses.[65]

At the same time there was no change of attitude by the government *vis-a-vis* the accommodation of black mine workers in the industry. When the 1940 commission of inquiry into that year's Copperbelt miners' strikes recommended that there was need to provide suitable and adequate housing for married employees, the Northern Rhodesia Government response was very lukewarm.[66] Although the state accepted the recommendation, it made it crystal clear that its acceptance should not be interpreted as "government commitment to the policy of establishing a permanent industrialised Native labour on the Copperbelt".[67]

serious that often boys attacked by rats failed to run errands for the unmarried workers with whom they lived.[73]

Inadequate housing led to overcrowding which favoured lice-breeding. Like rodents, lice too were instrumental in the spread of typhus.[74] In the early 1940s lice played such a key role in the spread of the disease that mine's health advisor M. Watson, advised the Mine Secretary to order the evacuation of the people from lice-infested huts in order to undertake a delousing exercise.[75] Although this was done it offered no lasting solution to the problem of lice and diseases associated with these disease vectors. By 1944 typhus in the compound "reached the proportions of an epidemic".[76]

A more successful measure against lice and rats should have been provision of sufficient burnt-brick houses, constant disinfection, avoidance of crowding and provision of sleeping arrangements for miners' children. Although some of these observations were noted by a commission appointed in 1945 to inquire into the administration and finance of African housing in urban areas, the Northern Rhodesia Chamber of Mines strongly objected to them as implementation of improved housing would have led to expansion in the cost of African labour in general and housing in particular.[77]

In combating rats and lice and other vectors of diseases, the management employed cheaper, albeit unsuccessful, measures. During the war, the mine imported rat traps from South Africa. Although these could trap as many as a hundred rats a week they could not eradicate rat-breeding.[78] Thus Africans found it necessary to keep cats in their huts to catch rats. This practice, however, met little success in the face of the overcrowded and insanitary nature of the compound.[79]

Overcrowding in compound huts constituted another significant way in which housing militated against good health in the African community. The expansion of the labour force in the war period from 7,086 in 1939 to 8,460 in 1941 and also the rise in the dependent population to about 30,000 people was not paralleled by an increase in accommodation.[80] It thus became not uncommon for five or more married couples to live in a one roomed hut while about eighteen single labourers shared rooms designed for three people.[81] Such overcrowding was ideal for the spread of disease notably pneumonia, typhus, influenza and other diseases associated with overcrowding.

At Luanshya, the problem of overcrowding was aggravated by amalofwa (the unemployed dependants) who were job-seekers the mine could not absorb. The presence of numerous "loafers" at the mine or elsewhere can be best understood in the context of the forces unleashed by the colonial political economy which gave an impetus to wage employment and reduced African capacity to earn a living in the pre-capitalist sector. Among such forces included the imposition of taxation on Africans, the alienation to whites of fertile land near lines of communication, the passing of agricultural marketing policies in favour of European farmers, and the neglect and or absence of transport network in the countryside and also the growing demand for western goods.[82] Under such forces the mining industry offered refuge for Africans but not all could be engaged.

Attempts by the mine management and the government to rid mine compounds of unwanted labour proved futile. At the Roan Antelope Mine, government and mine policemen frequently raided the compound and prosecuted "loafers" but failed to contain the situation.[83] The result was massive overcrowding which spelt disaster when epidemics broke out. The "loafers" posed an added health risk in

that they were not immunised and could, therefore, transmit diseases to miners and their families in the compound.[84]

Coupled with deterioration in other living conditions, overcrowding played a major role in the spread of respiratory diseases especially pneumonia. In the war period during which about 12,000 miners were employed, pneumonia afflicted more than 1,000 African miners out of whom 63 lost their lives. During the same period, pneumonia patients and those the disease killed amongst "loafers" and miners' families more than doubled.[85]

Like housing, sanitation in the compound deteriorated during the Second World War. As the labour force increased, the compound population rose, so did pressure on the existing communal latrines. F.W. Jameson, a housing expert from South Africa noted when he visited the Roan Antelope Mine and other mines during the war that latrines were "too few", too far away from dwelling places, lacked official attendance and there was no provision of latrine facilities for children. Jameson further noted that precincts of the latrines themselves and those of the dwelling places were consequently littered with human excreta and thus the disposal of night soil constituted a health risk.[86]

Poor sanitation was exacerbated by unsatisfactory means of disposal of garbage from the compound. The compound itself became too big and thus heightened the thorny issue of removal of rubbish.[87] Additionally, all mine vehicles intended for collection of refuse were commandeered towards copper production services after the war broke out and henceforth the mine contracted the Luanshya Whitmarch Cartage Company to carry garbage out of the compound. This company, however, failed to do the work satisfactorily due to transport problems chiefly caused by lack of spare parts for its

vehicles. In many letters to the manager of the Luanshya Cartage Company, the Mine Secretary in the 1940s expressed his disappointment at the company's inability to collect rubbish from the compound.[88]

With the deterioration in compound sanitation and falling standards of the disposal of faeces, the mine saw an increase in diarrhoeal diseases. The incidence of typhoid jumped from twenty-six cases in 1943 to forty-one in 1944.[89] During the same period cases of bacillary dysentery soared. After 1943 the Roan Antelope Mine recorded the highest number of cases of bacillary dysentery on the Copperbelt.[90]

That sanitation deteriorated to a level that it became a serious health hazard was largely due to management preoccupation to increase production and its indifference to matters relating to sanitation. The collapse in sanitation went unchecked by the colonial state which as late as 1943 did not extend public health regulations to the mining industry.[91] Attempts to do so were successfully resisted by the Northern Rhodesia Chamber of Mines in the same year as this would have meant increasing expenditure on compound sanitation.[92] As a result no noticeable improvements in sanitation were noted even after the Second World War and therefore diarrhoeal diseases went on afflicting Africans.

In addition to promoting diseases associated with housing and sanitation, the Second World War led to a critical shortage of food and, through this, malnutrition-related health problems especially among miners' wives and children. The critical shortage of food at the Roan Antelope Mine was recorded by the Compound Manager, C.F. Spearpoint. He noted that:

> The effect of the war on native foodstuff became noticeable in March 1942, when beans and nuts were in

> short supply and meat on two occasions had to be substituted. In April the same year part of the cereal issue had to be made up of cassava meal. From this time onward to June 1945 there have been numerous alterations to the food scale, and almost without exception all items of food have been affected at one time or another.[93]

As a matter of fact, the acute scarcity of food at the Roan Antelope Mine began much earlier than Spearpoint observed. The supply of meat, a rich source of protein was interrupted as early as 1940 partly because of the war and partly because of the outbreak of foot and mouth disease in colonial Zimbabwe and various cattle diseases in Barotseland which rendered meat from there unfit for human consumption.[94] The war time drought-induced famine which affected several places in tropical Africa and claimed 300,000 lives in Rwanda, accentuated the food crisis at the Roan Antelope Mine even though the colonial government came to the aid of mining companies by importing maize.[95] Thus the war combined with ecological factors in reducing food supply and inevitably led to a rise in food prices. The cost of meat bought by the RST rose from 31d per pound in March 1942 to 3S.75d per similar weight four months later.[96]

In order to reduce expenses on feeding Africans the mine undercut food issues. Expenditure on feeding miners' children and wives was reduced to a minimum level. A labour officer who visited the mine towards the end of 1942 noted that miners' wives were only issued 81 pounds of mealie meal and offals every week while children received only 31 pounds of mealie meal.[97] For a large part of the war period mealie meal was supplemented by less nutritious foodstuffs like cassava and millet. Cassava contains only 1.5 percent of proteins,[98] and it and other less nutritious food stuffs were instrumental in the spread of kwashiorkor and marasmus in miners' children and wives. According to L.M. Rodger, a mine

medical officer at Luanshya in the 1940s, it came to be recognised by mines' department of health that a large number of miners' children in the nine months to two years age-bracket suffered from kwashiorkor.[99] Kwashiorkor, a disease which retards mental and intellectual development in infants and children who survive it, is caused by a diet deficient in protein. At Luanshya, this disease was invariably fatal in children. Marasmus on the mine seems not to have been as common as kwashiorkor.

In 1943, Lynn Saffery, a labour officer confirmed in a report to the labour department Rodger's argument that several families in the mining industry were suffering from deficiency problems. He attributed these problems to the meagre rations companies issued to Africans and also to low wages paid to black miners. Not only was Saffery's report proscribed but the author himself was soon banished to South Africa by the Northern Rhodesia Government on the instigation of mining companies.[100] His report therefore was never published.

The swiftness with which the Saffery report was suppressed reflects the lackadaisical attitude by mining capital and state *vis-a-vis* the feeding of black labour. Indeed, as early as 1940, both capital and the state objected to the implementation of the "Rokana food experiment" which contained adequate protein in form of animal flesh as well as sufficient fruit and vegetable needed in supplying required vitamins.[101] Although the 1940 Commission, alluded to earlier in this chapter, recommended that this experiment be extended to Roan Antelope Mine and other Copperbelt mines, the recommendation was rejected by the Northern Rhodesia Government because improved diet for Africans would have fostered labour stabilisation and urbanisation.[102] For its part, the RST

rejected the recommendation as it would have led to increased expenditure on feeding African labour.

Denied improved diet, African miners' wives and children continued to be prone to malnutrition-related diseases. Children and women who suffered from kwashiorkor were vulnerable to infection by pneumonia, tuberculosis and typhus continued to attack a lot of ill- fed people in the compound.[103] Health problems engendered by the war were compounded by war-time shortages of drugs and inadequate medical care. While the management ensured that African miners enjoyed full medical attention and had sufficient hospital accommodation, the same cannot be said of women, infants and children. As late as 1945 there was no full time doctor to attend to the numerous patients who sought treatment at compound clinics. These patients were exclusively miners' wives and children and also those of government employees. For these, hospital accommodation was throughout the war merely a quarter of that reserved for miners themselves.[104] Neither the state nor the management tried to improve the hospitalisation of miners' dependants by increasing medical personnel to attend to patients. Although A.C. Fisher, an outstanding Chief Medical Officer at Roan, tried to persuade the management in the 1940s to recruit more African nursing sisters to attend to women and children, he met with no success.[105] When the colonial state began in 1945 to send white girls to Britain to train as nurses, there was no attempt to send African girls, partly because of lack of education among African girls and partly due to opposition from white nurses in Northern Rhodesia who feared competition.[106]

Thus compound clinics tended to rely on semi-illiterate medical orderlies who, without doubt, were cheaper to recruit but

whose nursing competence was described by a former nurse at Luanshya a "nil". The same nurse remembered that the semi-illiterate orderlies were on engagement so raw that they usually failed to read prescriptions and more often than not administered wrong drugs. She further contended that the high rate of mortality among women and children during and after the war was partly due to the deficient medical care they received.[107]

Conclusion

In summary, it can be asserted that the Second World War played a key role in the changes that occurred in the epidemiological landscape at the Roan Antelope Mine. It promoted the surfacing of pathological diseases and also acted as a catalyst in the deterioration of health conditions. The increase in diseases such as typhoid, typhus, kwashiorkor and marasmus was a product of such deterioration.

NOTES

1. NAZ/SEC/1295: Malcom MacDonald, Colonial Office to John Maybin, 11 January 1940.

2. Northern Rhodesia, Legislative Council Debates: Fourth Session of the Sixth Council, Resumed 1-3 June 1940 (Lusaka: Government Printer, 1940), p. 7. Also cited in Chipungu, State, pp. 60-61.

3. ZCCM/RACM WMA 55/3: R.M. Peterson, Summary of Operations for the six years ended 30 June 1945.

4. Ibid.

5. Pneumoconiosis is a general term which refers to pathological conditions of lungs caused by inhalation of dust. Pneumoconiotic diseases are classified according to the main constituents of dust which lead to such conditions. Examples of pneumoconiotic diseases include asbestosis caused by asbestos and silicosis caused by silica. For details see R.R. Sayers and R.R. Jones Silicosis and Similar Dust Diseases: Medical Aspects and Control (Washington: Government Printing Office, 1938), p. 1.

6. Jones, Silicosis, p. 1. See also V. Balashov. "Pneumoconiosis Dust Research in Northern Rhodesia", in G.J. Snowball (ed.), Science and Medicine in Central Africa, Proceedings of the Central African Scientific and Medical Congress held at the College for Further Education, (Lusaka, 26-30 August 1963), pp. 219-220.

7. ZCCM 10/8/2B: Frank Ayer to Secretary RACM, London, 27 December 1933.

8. ZCCM 10/8/2B: Frank Ayer to H.J. Munroe, Consulting Engineer, Rhokana Corporation Ltd., Johannesburg, 25 December 1933.

9. On endorsement of Frank Ayer´s views see ZCCM 10/8/2B: Secretary, London to Frank Ayer, 9 January 1934. On the findings of the Inspector see, ZCCM/RACM 10/8/2B: Inspector of Mines to General Manager, 24 July 1934.

10. Lambrechts, Report, p. 8.

11. Lambrechts, Report, pp. 1-20.

12. For details on the ventilation of the Roan Antelope Mine in the 1940s, see, ZCCM/RACM 10/8/4C: G.E. Mc Elroy, Preliminary report on ventilation of Roan Antelope Mine 9 February 1940.

13. Bwembya Bweupe, Ex-miner, Interview, Luanshya, 6 March 1992.

14. These included Benson Sampa, Interview, cited; Bonus Sitembeya, Cage tender, Interview, Luanshya, 10 March 1992; E. Mulobelwa, Shift Boss, Interview, Luanshya, 11 March 1992.

15. See A Gray, "Pneumoconiosis on the Copper Mines of Northern Rhodesia", in Snowball (ed.), Science and Medicine, p. 774.

16. See NAZ/SEC1/1378: Director of Medical Services to Acting Chief Secretary, 26 June 1944; NAZ/SEC1/1378: Extract from Hansard, 50, 4 July 1945.

17. See ZCCM 10/8/2B: Colonial Office to Representatives in London of Gold Mining Interests in East Africa, 13 November 1925.

18. Gray, "Pneumoconiosis", p. 769; Northern Rhodesia, Mines Department Annual Report for the Year Ended 31 December 1946 with Preface Covering the Year 1939 to 1945 (Lusaka: Government Printer, 1947), p. 8.

19. ZCCM/RACM 10/8/2B: L.G. Irvine to A.J. Orenstein, Johannesburg, 15 July 1939.

20. See for example Northern Rhodesia, Report of the Committee Appointed to Examine Certain Aspects of Silicosis 1943-1944 (Lusaka: Government Printer, 1944).

21. Northern Rhodesia, Mines Department Report, 1946, p. 8.

22. Perrings, Blackworkers, p. 230.

23. NAZ/SEC1/1378: Extract from Hansard, 49, 30 June 1945; NAZ/SEC1/1378 S.S. Taylor and R.L. Prain to Governor, Northern Rhodesia, 4 January 1945.

24. NAZ/SEC1/1379: Extract from Northern News, 15 March 1945.

25. Cassnel Mulenga, Ex-miner, Interview, Luanshya, 10 March 1992.

26. Gray, "Pneumoconiosis", p. 775.

27. Kabole Chilindi, Interview cited; See also Northern Rhodesia, Report of the Commission on Silicosis Legislation (Lusaka: Government Printer, 1949), p. 8.

28. Kabole Chilindi, Interview cited.

29. ZCCM/RACM 12/3/6B/3: Director of Medical Services to Secretary, 7 January 1957; Northern Rhodesia, Report on Commission, 1949, p. 8; See Luchembe, "Finance capital".

30. Pascal Mpundu, former nurse, Interview, Luanshya. A similar experience has been documented in Botswana. See A.C.S. Mushingeh, "A History of Disease and Medicine in Botswana", (Ph.D. Thesis: St. Johns College, 1984), p. 194.

31. Pascal Mpundu, Interview cited.

32. Mereth Turshen, "Review Article on Randall Packard's White Plague", African Economic History 19 (1990-91), p. 208.

33. Fabian Chilufya, Interview cited. See also Luchembe, "Finance Capital", pp. 277-278.

34. E. Thompson, The Making of the English Working Class (London: Grollancy 1965), p. 192.

35. Kabole Chilindi, Interview cited; Pascal Mpundu, Interview cited.

36. NAZ/SEC1/1338: Labour Officer, Report on Visit to Roan Antelope Mine, 29-31 December 1942.

37. ZCCM/RACM 11/4/1C: Spearpoint, Memo to Manager, 27 April 1942.

38. Fabian Chilufya, Mine Shaft Captain, Interview cited.

39. ZCCM/RACM 15/1/3B: Chief Inspector of Mines to Manager, Luanshya, 11 January 1944.

40. Ibid..

41. Northern Rhodesia, Legislative Council Debates. Fifth Session of the Sixth Council, 30 November-16 December 1940 (Lusaka: Government Printer, 1941), pp. 380-389.

42. Ibid..

43. See Northern Rhodesia, Labour Department Annual Report 1944 (Lusaka: Government printer 1945), p. 3.

44. ZCCM/RACM WMA 192/193: Native Labour Association 1939-1945.

45. Northern Rhodesia, Mines Department Annual Report for the Year Ended 31 December 1946 with preface Covering the Years 1939 to 1945 (Lusaka: Government Printer 1947), pp. 7-21.

46. Henry Nkonda, Mine Shaft Captain, Interview, Luanshya, 6 march 1992.

47. See Perrings Black Mine workers, p. 172.

48. NAZ/SEC1/1378: Report on Visit to Roan Antelope Mine 25-28 August 1942.

49. NAZ/SEC1/1378: F.C. Robinson to Chief Secretary, 2 February 1944.

50. See ZCCM/RACM 11/4/1C/1: Notes on meeting between labour officer and a member of the Roan Antelope Mine Tribal Representative, Luanshya 24 March 1942; Unza Joint History Project, 1974, Man/16; P. Lukutati, Crew Boss, Interview, Luanshya, 10 March 1992; ZCCM/RACM 11/4/1C/1: List of matters raised by African Tribal representatives, 1942.

51. See Mubanga E. Kashoki, "Migrations and Language Change: The Intersection of Town and country", in David Parkin (ed.), Town and Country in central and Eastern Africa Studies Presented and Discussed at the Twelfth International African Seminar Lusaka, September 1972 (London: Oxford University Press), pp. 244-245.

52. P. Mubanga, Crew Boss, Interview, Luanshya, 10 March 1992.

53. Parpart, Labour, p. 39; Leroy Vail, "The Political Economy of East-Central Africa", in David Birmingham and Phyllis M. Martin (eds), History of Central Africa Vol. 2 (London: Longman 1983), p. 246.

54. Dominic Mufumpa, Ex-miner, Interview, Luanshya, 7 March 1992. This information was supported by other informants like Biton Silungwe, Crew Boss, Interview, Luanshya, 10 March 1992; Langazi Kaluba, Ex-mine Policeman, Interview, Lusaka, 19 August 1992; Jone Machai, Safety Officer, Interview, Luanshya, 11 March 1992; Period Changwe, Section Boss, Personal Conversation, Luanshya, 9 March 1992.

55. Dominic Mufumpa, Interview, cited.

56. Ibid..; Winter Chola, Safety Officer, Interview, Luanshya, 10 March 1992.

57. ZCCM/RACM WMA 17: J.H. Walace to Secretary, NRCM, 10 December 1943.

58. See ZCCM/RACM 11/4/1C/1: Spearpoint, Memo to Manager, 10 July 1942.

59. NAZ/SEC1/1338: Labour Officer Report on Visit to roan Antelope Mine 25-28 August 1942.

60. A.R. Sokoloko, Superintendent, Interview cited.

61. NAZ/SEC1/1338: Labour Office, Report on visit to Roan Antelope Mine 19-21 November 1942.

62. Luchembe, "Finance Capital", p. 280.

63. Luchembe, "Finance Capital", p. 281.

64. NAZ/SEC1/1338: Labour Officer, Report on Visit to Roan Antelope Mine, 25-28 August 1942.

65. NAZ/SEC1/1338: Report on Visit to Roan Antelope Mine, 7-9 September 1943.

66. See Northern Rhodesia, *Report of the Commission Appointed to Inquire into Disturbances on the Copperbelt* (Lusaka: Government Printer, 1941), p. 32.

67. Northern Rhodesia, *Statement by Government of Northern Rhodesia on Recommendations of the Copperbelt Commission 1940* (Lusaka: Government Printer 1941), p. 3. See also NAZ/SEC1/1378: Provincial Commissioner, Ndola to Secretary for Native Affairs, 19 June 1941.

68. Jameson, *Report*, p. 7.

69. ZCCM 15/1/3B: A.C. Fisher to Assistant Manager, 30 October 1944.

70. *Ibid.*.

71. Anonymous, "Rodents", *Roan Antelope* 6,6 (June 1957), p. 11.

72. Kabole Chilindi, Interview cited. For details on the symptoms of rat-bite fever see Samuel L. Andelman, *The New Home Medical Encyclopedia Vol. 4* (New York: Quadrangle Books, Inc., 1973), pp.1026-1027.

73. Kabole Chilindi, Interview cited.

74. ZCCM 15/1/3B: M. Watson to Mine Secretary, 7 August 1940.

75. *Ibid.*.

76. ZCCM/RACM 10/8/2B/2: Spearpoint and Chief Medical Officer to Assistant manager, 13 November 1944.

77. See Northern Rhodesia, *Report of the Commission Appointed to Enquire into the Administration and Finance of Native Locations in Urban Areas* (Lusaka: Government Printer, 1944); This commission in fact was meant to look into housing of African government employees. Its far reaching recommendations, however, alarmed mining companies which felt that the state might ask mines to also implement the recommendations of the commission. See ZCCM/NRCM 10/8/2B/2: Memo on the Commission Appointed to Enquire into the Administration and Finance of Natives Locations in Urban Areas, 15 March 1945.

78. ZCCM/RACM 10/8/2B/1: Spearpoint to Assistant Manager, 30 September 1943.

79. Henry Kaluba, Lecturer, University of Zambia, Lusaka, 21 October 1991.

80. See ZCCM/RACM 10/8/2B/1: Spearpoint, Memo to Manager, 12 March 1941.

81. Langazi Kaluba, Interview cited.

82. For more details on issues raised here see Vickery, "Saving Settlers"; Perrings, "Consciousness", pp. 38-41; Mbelela Mulobela, "The Consequences of WNLA Closure on Bulozi 1966-86" (M.A. Dissertation: UNZA 1987), p. 22; Parpart, Labour, pp. 26-27.

83. Langazi Kaluba, Interview cited; See also Northern Rhodesia, Labour Department Annual Reports for the Years 1941-1945.

84. D.Y. Mulenga, Ex-nurse, Interview, Luanshya, 10 March 1992.

85. See Table I; Information on pneumonia in non-miners was supplied by Kabole Chilindi, Interview cited.

86. Jameson, Report, p. 8.

87. ZCCM/RACM 11/3/4F/1: Spearpoint Memo to Mine Secretary, 17 March 1945.

88. See ZCCM/RACM 11/3/4F/1: Mine Secretary to Controller of Supplies, Lusaka, 19 April 1944; ZCCM/RACM 11/3/4F/1: Mine Secretary to Luanshya Cartage Company, 5 March 1945.

89. ZCCM 15/1/3B: A.C. Fisher Memo to Assistant Manager, 30 October 1944.

90. Kabole Chilindi, Interview cited.

91. See ZCCM 12/7/5C: Notes on Meeting between H.M. Williams, Representative of NRCM and Deputy Director of Medical Services, Kitwe, 15 June 1943.

92. Ibid..

93. ZCCM/RACM 55/3: Compound Manager to Manager, Luanshya, 30 June 1945.

94. See ZCCm 12/1/3A/2: Business Manager, Memo to Acting Manager, 10 October 1940; ZCCM/RACM 12/1/3A/2: J.F.C. Haslam to Chief Secretary 28 April 1940.

95. See Chipungu, State, p. 64; On the impact of this drought in various parts of Africa see John Iliffe, Famine in Zimbabwe 1890-1960 (Gweru: Mambo Press 1990), p. 89.

96. ZCCM 12/1/3A/2: Business Manager to Messrs Warner and Company, 17 July 1942.

97. NAZ/SEC1/1338: Labour Officer, Report on Visit to Roan Antelope Mine, 19-21 November 1942.

98. See E. Baker Jones, "Some Nutritious Problems in Central Africa", Central African Journal of Medicine, 5 (February 1956), pp. 62-70.

99. Rodger, "Development", p. 252.

100. Parpart, Labour, p. 102; See also NAZ/SEC1/1363: Extract from Confidential Despatch, 12 April 1944.

101. For details on this experiment see ZCCM/RACM 10/8/2A/4: Extract from The Times, 17 February 1940.

102. See Northern Rhodesia, Report of Commission 1940, p. 33; Northern Rhodesia, Statement, p. 3.

103. Kabole Chilindi, Interview; On how malnutrition undermines its victims' resistance to disease see Zbigniev A. Konczacki, "Infant Malnutrition in Sub-Saharan Africa: A Problem in Socio-Economic Development", Canadian Journal of African Studies 6, 3 (1972), pp. 433-449.

104. ZCCM 12/3/6B: H.R. Finn to RACM Secretary, London, 30 May 1945.

105. ZCCM 12/3/6B: Fisher Memo to Assistant Manager, 9 March 1945.

106. ZCCM WMA 57/1: Extract from Bulawayo Chronicle, 9 November 1945. During and after the war the role of the state in providing medical services to Africans was marginalised due to inadequate funding of medical services by the Colonial Office. See Northern Rhodesia, Ten Years Development plan as Approved by Legco, 11 February 1947 (Lusaka: Government Printer 1947), p. 9.

107. Alfred Silutongwe, former mine nurse, Interview, Luanshya, 9 March 1992.

CHAPTER THREE

CLASS AND HEALTH, 1946-1964

After the Second World War, two distinct classes emerged within the African workforce at Luanshya and in the mining industry as a whole. These were a small relatively highly paid middle class of senior African employees and a large class of low income earners, mostly labourers. The latter made up more than half of the entire labour force. Unlike the former who lived in spacious European-like houses; enjoyed cost of living allowances; and did supervisory work, the low-income earners continued to live in overcrowded houses; on inadequate company rations and were subjected to rigorous manual labour. The purpose of this chapter is to demonstrate how these varying working conditions affected the health of the two classes. Firstly, the chapter briefly discusses the origin of class distinctions within the African labour force. It then, secondly, tries to compare the living and working conditions of these classes. Finally, the chapter seeks to indicate that favourable conditions under which the middle class lived and worked largely insulated them from pathological, over-crowding and faecally-related ailments to which the low-income class continued to be exposed.

Rise of the Middle Class

Prior to the Second World War, the Rhodesian Selection Trust and other mining companies in colonial Zambia encouraged ethnic rather than occupational distinctions within the mine compounds. As Parpart argues, this policy was aimed at minimising class differences and in this way hamper the development of class

consciousness.[1] After the war, this policy which had the support of the colonial state was no longer tenable for two reasons. Firstly, the rapid mechanization of the mines in the post-war era, necessitated the rise of a small group of highly skilled Africans.[2] Secondly, worker consciousness itself crystallised in the formation of the African Mineworkers Union in 1948. The skilled Africans formed the backbone of the Union's leadership.[3] To emasculate the union, the RST and other companies gave middle class employees staff status and encouraged them to form the mine African Salaried Staff Association (MASA) in 1955.

The impetus for the emergence of class distinctions also emanated from the imposition of the Federation of Rhodesia and Nyasaland in 1953 and African advancement negotiations of the 1940s and 1950s which tended to categorise African employees in terms of the level of skill, responsibility which attached to a job, level of eduction and length of service. The Federation itself brought hopes of more national stability and of extensive cultural and economic development in the colony.[4] This led to change of attitude by companies and the colonial state vis-a-vis the rise of a small residential African middle class on the Copperbelt.

As pointed out earlier, the middle class consisted of senior black miners. At Luanshya and elsewhere they were designated as "special group" by the management and bamakobo (collaborators) by the rest of the African labour force because they tended to side with the management in industrial disputes. The bamakobo included shift bosses, underground foremen and draw officers all of whom had long working experience and some colonial education. They also were engaged in supervisory work at the lowest level.[5] In this and other aspects, they differed from the low income miners most of whom

had no formal education, and did manual work which exposed them to various occupational health hazards.

Commensurate with their vast experience, education and skills, the new middle class was comparatively very highly remunerated. In the early 1950s, for example, African supervisors and high grade workers who were few in number, received monthly wages ranging between 232 and 405 shillings per thirty ticket days. In contrast the majority of African employees' wages averaged only between 80 and 130 shillings.[6] This wage differential is important in understanding, as will be shown later, the virtual absence of diseases associated with diet among the highly paid miners and their families.

The differential is also important in understanding the form of housing for African mine workers at the Roan Antelope Mine after the Second World War. To placate the highly paid class of workers all of whom could afford to pay rent, special rat-and mosquito-proof houses for staff miners alone were built up out of the compound following negotiations between mining companies, the African Mineworkers Union and the Northern Rhodesia Government in 1949 and 1952.[7] The new staff section stood separately from the rest of the compound and it consisted of European-like houses. These houses were of burnt brick walls with spacious three bedrooms, kitchen store, piped water, electricity and independent toilets inside.[8] Although these houses were only 146 in 1954, their number rose after the erection of Mpatamatu township in 1958 to the north of the old compound so that by 1961 there were about 4,920.[9] Given the relatively small number of senior African employees and high grade workers who occupied these houses, this form of accommodation, towards which in 1954 occupants paid a monthly rental of £2 10S, was

adequate.[10] In the staff section near the old compound and in the new African township in Mpatamatu which was exclusively for African supervisors and high grade employees, there was thus no overcrowding. Indeed, living in the two areas was a symbol of prestige and high status.[11]

For low-income households who were deficient in education, skill and experience housing also improved generally. The one-roomed huts were gradually replaced by two-roomed sun-dried brick and iron-roofed houses even though some of the old huts remained on the mine for occupation by the least skilled. The improvement in housing for the unskilled workers like lashers, "chola boys" or helpers, "spanner boys", sweepers and night soil collectors did not however put an end to overcrowding and diseases like typhus associated with housing. Unlike the African middle class who on top of their high wages enjoyed housing subsidies, these workers could not afford to pay rent and thus improvements in their housing remained marginal up to 1964.[12] Neither were communal latrines replaced by inside sanitation. Thus, as will be demonstrated later, faecal diseases continued to plague the lower class at the Roan Antelope Mine.

Unlike housing, medical attention and care for Africans dramatically improved in the period between 1946 and 1964. Because the government no longer discouraged urbanisation on the Copperbelt, its role in health delivery in the copper industry expanded. In 1951, the Northern Rhodesia Government contributed £24,000 towards the cost of extensions to the mine hospitals.[13] A year later, it contributed £2,419.5S 2d for the building of additional female wards at the Roan Antelope Mine.[14] Eventually, the government even relieved the RST of providing medical treatment to non-mine

patients. In 1958[15] it built its own hospital at Luanshya. Henceforth only African miners and their families were treated at the compound clinics and hospital. The shortage of medical personnel was also resolved by initiating a training programme for African nurses on the mine in 1951 under the auspices of the Northern Rhodesia Chamber of Mines.[15]

Comparatively, these improvements in the provision of hospital accommodation and medical personnel weighed more in favour of the new African middle class than ordinary employees. From the late 1940s not only were senior miners given separate wards, but their wives and children were also given similar wards and received more medical attention from nurses and doctors.[16] By 1963 there were fifteen such wards for African supervisors and nine for their wives and children. Added to these improvements were additional ward services like lockers, beds, knives, forks, spoons and saucers for use by in-patients.[17] These special services, like special accommodation, were calculated to draw the middle class closer to the management. In this way bamakobo began to identify themselves with mining capital and played a key role in weakening the militancy of the African Mine Workers Union.

Although the hospitalisation and medical care for the rank and file improved, low-income miners, children and wives did not enjoy special medical facilities accorded to the middle class. As late as 1958, a medical doctor at the Roan Antelope Mine complained that "we have always been aware that our treatment of African children [in low income families], even though it does represent a great deal of improvement on the past leaves a great deal to be desired".[18] The general increase in hospital accommodation and nurses could not by and large cope with the big compound population estimated in the

1950s around 50,000.[19] In 1958 the hospital lacked 136 hospital beds to accommodate miners' children and wives and thus overcrowding in the hospital wards was common.[20] Also there was a tendency by nurses and doctors to spend more time in the treatment of the privileged patients than the lowly paid miners' wives and children. As late as the mid-1950s there were no whole time services of a medical doctor at any of the three compound clinics then in operation.[21]

The discrepancy in the treatment of middle class patients and the rest of the compound population affected the recuperation rates of the two classes differently. One informant recalled that the <u>bamakobo</u> and their families hardly stayed long in hospital as in-patients.[22] This may be attributed to the special medical attention bestowed on the middle class. On the other hand oral evidence suggests that wards occupied by patients from low income homes in the compound were ever filled with patients. One plausible explanation for this situation is that the level of recuperation was lower than that of the middle class. This situation can also be attributed to relatively inferior medical attention and overcrowding in the hospital wards for ordinary in-patients.

Discrimination in the hospitalisation of Africans of the different classes did not go unnoticed by blacks on the mine. Some few months before independence, the United National Independence Party (UNIP) Roan Branch hospital committee complained to P. Fenn, the African Personnel Manager (formerly Compound Manager) that:

> People with high rank are treated better than a labourer, they are given better food, better plates, cups and they are given separate places where to sleep. Our committee is against this idea of superiority.[23]

It is thus clear that Africans on the mine were aware of the class distinctions that evolved there. They were also aware of the

differences in the living and working conditions under which they lived.

Class and Occupational Health Problems

The different material and working conditions under which Africans lived affected the health of the two classes differently. The nature of the work and the living style of the middle class exposed senior employees and their families less to pathological, overcrowding and diarrhoeal and dietary maladies than the lower labouring class.

Evidence suggests that pathological diseases took an upswing trend at Roan despite improvements in ventilation. In particular silicosis cases expanded as the mine intensified production in the post-war years especially during the Korean war of the 1950s when the copper demand grew. At the Roan Antelope Mine cases of silicosis grew from thirty-six in 1951 to seventy in 1953, eighty-five in 1954 and to eighty-seven in 1956.[24] According to informants nearly all cases of silicosis were detected in the lowest grade of mineworkers and very few senior employees were found with the disease at the Silicosis Bureau after it was established in Kitwe in 1950. Informants further noted that the most susceptible groups of miners were those engaged in dusty operations both on the surface and underground.[25] It is easy to explain why fewer cases of silicosis were found among the privileged workers. Unlike lashers and drillers who were employed to do dusty work, middle class employees only did surveillance work. They were therefore not as much exposed to silicosis inducing dust as were drillers and other workers.

Like silicosis, tuberculosis was virtually absent among the bamakobo and their families but rampant in the old compound. This discrepancy may be explained from two points of view. Firstly, senior workers, like European miners were less vulnerable to silicosis which, as was noted in chapter two, induced tuberculosis. In turn this meant that the rate at which tuberculosis could be imported into middle class homes was low. Secondly, and perhaps more significantly, the bamakobo and their families were relatively more affluent. As noted already, they lived in spacious houses and, because of their high monetary remunerations, could afford to live on balanced diet.[26] These tuberculosis prophylactic measures protected senior African mineworkers and their families from the disease.

The absence of such preventive measures among low income class families heightened their vulnerability to tuberculosis. In 1954, a mine's medical report noted that infection by that disease was on an upward trend notably amongst children and women in the compound.[27] Although medical authorities were not oblivious of the close connection between living conditions and tuberculosis, they recommended large scale inoculations with Vole Bacillus against Africans who reacted negatively to the heaf test.[28] The failure of this measure in curbing tuberculosis amongst the poorly paid households on the mine came to light two years later. In 1956, a miniature radiographic survey carried out on the mine by the Tuberculosis Research Association revealed not less than fifty cases of infectious tuberculosis among Africans.[29] Another survey undertaken in May 1957 revealed ninety-seven cases of tuberculosis among African miners and their family members.[30] What is striking

about these findings is that nearly all the cases were found amongst low income families.[31]

The rise in tuberculosis cases in the African community worried the management at Luanshya. The treatment and accommodation of African tuberculotics constituted a lengthy and costly venture to the company. The management, therefore, urged the NRCM to persuade the colonial state to accommodate and treat tuberculotics arguing that this was state liability.[32]

Government response was essentially negative. Thus a protracted verbal battle over who should bear the cost of the treatment of Africans who contracted TB, as tuberculosis is commonly known, raged between the government and the mine owners. As no solution was forthcoming, the mine continued to repatriate victims of the disease to the countryside well into the late 1950s and early 1960s—a practice which drew sharp criticism from the colonial government.[33]

It is evident from the discussion that neither preventive nor curative measures were organised to deal with tuberculosis effectively. It is also clear that this mainly affected the bulk of the compound population more than the African middle class. This trend extended to other occupational health problems like dermatitis, conjunctivitis, assaults and mining accidents.

In its bias in favour of the African middle class miners, the RST worked tirelessly to normalise working relations between senior African workers and their white counterparts. The government fostered discourse between the two groups of workers. They encouraged whites to attend debates organised by senior black employees on a variety of topics. At the same time educated Africans were encouraged to read English books in the compound

library to improve their English. In this way the language barrier, so instrumental in promoting assaults, was removed between African and European supervisors. In this way violence involving white miners against African supervisors rapidly diminished.[34]

In contrast, white-on-black violence against the unskilled mineworkers went on unabated. In the late 1940s, physical assault cases proliferated because the management was "reluctant to discharge Europeans guilty of unprovoked assaults" against unskilled employees.[35]. It became not uncommon daily practice for whites to gang up in beating Africans or encourage black supervisors to beat up their fellow blacks.[36] Complaints raised by assault victims were dismissed without proper hearing by concerned parties such as the police, the labour department and management. This *laissez faire* approach raised much discontent among the unskilled workers. In a letter to the Labour Commissioner in 1947, R.Philpott, a resident labour officer at Luanshya warned that unless ways were found to arrest the situation, violence against low income employees would lead to serious repercussions on the white community on the mine.[37]

The general dissatisfaction assaults engendered after the Second World War was serious enough to draw the attention of government officials. Towards the end of the 1940s, the colony's acting governor was alarmed by the "serious and dangerous" level of assaults perpetrated against unskilled African miners at Roan. He instructed the Provincial Commissioner in Lusaka to work out measures with the General Manager at the Roan Antelope Mine to end violence.[38] The governor's concern was even shared by the European Mineworkers Union which began to urge courts of law to impose stiffer penalties on whites found guilty of unprovoked

assaults against Africans. The EMWU based its argument on the fact that "assaults were almost always due to Europeans".[39]

Neither state intervention nor the white union's concern resolved the problem of assaults. The intensification of nationalist struggle after the imposition of the Federation, however, had a "sobering effect on white violence against Africans".[40] Not only did the African National Congress, formed in the early 1950s, and later UNIP vigorously campaign against European brutality, black miners themselves began to increasingly retaliate. Several informants recollected that hitting back against European provocateurs became common-place after 1953. They also remembered that notorious white provocateurs were usually waylaid at night and pounced on as they left their drinking places.[41] As the struggle for independence intensified, acts of revenge against white miners increased. Eventually, only very few whites belted their African subordinates. Violent acts virtually ended after 1962 when the first black government came to power.

Apart from silicosis, tuberculosis and violence which for so long was an affront to the physical wellbeing of African miners, mining accidents were influenced by the nature of work done as well as experience. Available evidence suggests that although fatal accidents generally declined, those involving serious injuries remained very high between 1946 and 1961 and thereafter. Indeed as Table IV shows, accidents involving serious injuries jumped from 385 in 1946 to 405 in 1947 and from 275 in 1930 to 269 in 1951.

Table IV: Fatal and Serious Accidents at the Roan Antelope Mine 1946-1961

YEAR	FATAL	RATE PER 1,000	S.I	RATE PER 1,000
1946	6	0.65	385	41.64
1947	13	1.29	405	40.88
1948	22	1.95	295	26.10
1949	21	1.96	344	32.70
1950	20	1.73	275	23.81
1951	19	1.75	269	24.76
1952	16	1.33	232	19.32
1953	20	1.76	273	24.04
1954	6	0.56	219	18.83
1955	10	1.06	204	21.72
1956	13	1.35	172	71.83
1957	14	1.56	172	1.91
1958	3	0.39	215	15.11
1959	7	0.39	187	22.08
1960	10	1.70	166	19.90
1961	6	0.74	167	20.60

Source: Compiled from Northern Rhodesia, Mines Department Annual Reports for the Years 1946-1961.

Note: S.I. = Seriously Injured.

The most vulnerable group of miners to mining mishaps in the post-war period were the unskilled workers with little mining experience. The nature of their work exposed this group of workers more to accidents particularly between 1947 and 1953 when production pressure mounted at the Roan Antelope Mine in response to increased world copper demand. During this period, about 130 Africans were killed in accidents involving gassing, blasting, explosions and falls in raises. Out of this number of accidents only about twelve African senior miners died and the rest were unskilled or semi-skilled workers.[42] Clearly skilled workers were less susceptible to accidents. This situation arose because of at least three main

factors. Firstly, skilled African middle class employees were not engaged in manual labour like drilling and lashing. In this way they were largely insulated from accident risks attendant with physical labour. Secondly, the senior workers were not subjected to deliberate fluctuations in standards of health required of labourers. While labourers' standards of physical health were lowered or increased depending on labour demand at the mine, this practice was not extended to the middle class workers.

The third factor in the discrepancy in accidents involving skilled and unskilled miners lies in the lower level of safety consciousness in the latter. To maximise production, the management trained unskilled workers for only one week in safety.[43] The training programme itself was haphazardly carried out. It was not only overloaded as it involved instruction in mining regulations, and acclimatization, but such instruction was done in Chikabanga, a mine language which new miners hardly understood. Part of the training merely involved watching English films on accident prevention. Due to their low level of education such films, like safety instructions in Chikabanga, played no marked role in inducing safety awareness.[44]

The lack of safety behaviour among the unskilled labourers manifested itself in a number of dangerous practices among that class of workers which rendered them prone to mining accidents. Alastair Heron, an accident expert who carried out a study into accidents in the 1960s, noted some of these dangerous practices. According to Heron, they ranged from "failure to use safety chains, descending or ascending a ladder with one hand not free to failing to remove dangling pipes in narrow raises at approximately face height".[45] The safety programme for the unskilled miners did not

therefore visibly influence accident prevention consciousness in the people it was intended for. The RST and other companies were however reluctant to improve the safety programme as doing this was going to be costly "both in terms of qualified instructors and of the time taken away from production".[46] Nor did the colonial state intervene to improve safety training programmes at the Roan Antelope Mine or elsewhere. This was reflected in the absence of uniformity in training programmes on various mines on the Copperbelt up to as late as 1967.

Ironically, the type of safety training programme for the African middle class and high grade workers lasted longer and was more comprehensive. For this category of miners, the period of training averaged three to four weeks during which some days were set aside to learn about some important aspects of prevention of accidents. Because of its comprehensiveness and length of time, the safety programme aroused a considerable degree of safety behaviour unnoticed in unskilled employees.[47] As Heron observed, it was largely this discrepancy in awareness which accounted for the lower rate of accidents among high grade and senior African mineworkers.[48]

It is thus possible that accidents would have been greatly reduced by extending the training programmes of the unskilled workers. In this way, the safety behaviour of unskilled miners would have improved like that of their African supervisors and other skilled miners. But improvement in training would have been, as already noted, costly to the RST which believed in limited expenditure on black labour. The company thus averted effecting improvements in safety programmes. Accidents thus continued to be considerably high. In 1961, fifty-six fatal accidents which would

have been avoided occurred and three years later the Roan Antelope Mine lost 20,293 shifts due to accidents alone.[49]

Class, Living Conditions and Diseases

Just as variety in skill, experience, type of work and length of safety training influenced the rate of occurrence of occupational health problems between the two classes of employees under review, differences in income, housing and sanitation differently affected the distribution of ill-health and diseases associated with living conditions. The occurrence of dietary, overcrowding and insanitary ailments was thus in the post-Second World War era to a large extent affected by class.

In the post-Second World War period diseases associated with dietary deficiencies like kwashiorkor proliferated in low income families in the compound. Such diseases were, however, virtually absent in the staff section of the old compound and after 1959 in Mpatamatu township which housed only high grade and middle class miners and their families. The near absence of kwashiorkor amongst middle class miners and its high incidence among low income households should be seen against a background of wage differentials earlier discussed. Unlike the emergent middle class, low income miners were paid meagre wages calculated "on the basis of the unattached worker" even though most of them were married.[50] Although the company continued to issue them with rations, the families could not subsist on such food and a larger number of miners found it necessary to use their niggardly wage remunerations to supplement compound food issues. In this way they met obstacles because of the high cost of living of the post-war period which

"increased to a greater extent than their cash wages".[51] The cost of living was so high after the war that African miners and some government workers at Luanshya organised a 14 weeks boycott of stores in 1946 and another in 1950 to protest against the high cost of food and other items.[52]

Under this high cost of living, poorly paid families could not afford to live on balanced diet. Thus cases of kwashiorkor increased as from the late 1940s. The situation was aggravated by crop failure in Central and Southern Africa which led to austere cuts in food issues to miners on the mine.[53] These cuts in ration issues persisted into the 1950s leading to more cases of kwashiorkor. In 1954, eighty-two miners´s children died of that disease or diseases induced by it like pneumonia or typhoid.[54] A year later cases of kwashiorkor and marasmus among low income families were said to be "distressingly frequent".[55] These cases of malnutrition occurred in spite of the establishment of feeding centres in the compound where African mothers were taught lessons in nutrition.

Health problems linked to poor diet were not confined to miners´children alone. Their mothers were also equally affected. Poor and insufficient diet weakened women´s resistance to various diseases and was invariably responsible for the high incidence of disease among low income miners´spouses. The high incidence of disease was reflected by non ante-natal cases treated in the compound. Among women such cases jumped from 3,238 in 1948 to 4,777 in 1951 and 5,211 in 1956.[56] A former nurse attributed these cases mainly to dietary deficiencies.[57]

Inadequate and poor diet was also the main factor behind the high rate of mortality amongst low income families of the Roan

Antelope Mine. The level of mortality of miners' wives jumped from 24 per thousand in 1955 to 27 per thousand in 1956 while the corresponding figures of infant and children's mortality were in these two years 372 per thousand and 380 per thousand respectively.[58]

Towards the end of the 1950s, not less than 3,039 cases of kwashiorkor in the miners' families were treated at compound clinics.[59] The irony of these cases of kwashiorkor and, those which were detected earlier, is that they did not as much affect families in the staff section of the compound as those in the rest of the compound. In 1959, not a single case of kwashiorkor was attended to at Mpatamatu clinic which catered for only high grade and middle class families.[60] As a former shift boss at the Roan Antelope Mine relieved, the virtual absence of kwashiorkor among these families was a result of balanced diet.[61] Since high grade and middle class families were highly paid, they could afford to live on nshima, milk, meat, bread, fish and tea. These families were also cushioned against the high cost of living because they received a cost of living allowance. From the early 1950s onwards, they all were given money in lieu of food. The payment of cash in the place of rations was extended to the rest of the workforce after the rolling strikes of the mid-1950s but wages for the bulk of the miners did not rise enough to rid the compound of malnutrition. As late as 1963, cases of marasmus and kwashiorkor were still being treated at the clinics.[62]

The preferential treatment given to well paid African miners and their families in terms of housing also minimised the spread of overcrowding diseases such as typhus, pneumonia, small pox and influenza. Of about 200 cases of pneumonia treated at the hospital

and clinics in 1955, only ten cases were noted in senior African employees and their families.[63] The rest of the cases were detected in people who lived in overcrowded housing. This reinforces the argument that the spread of pneumonia was facilitated by inadequate housing, poor diet and other health conditions.

Smallpox, another ailment associated with overcrowding and insanitary conditions, became rampant among low income families. Spread either by nose droplets or contact with crusts from dried skin lesions, smallpox first appeared at the Roan Antelope in 1946. At that time all Africans lived in the same compound and the smallpox epidemic affected families irrespective of class. A large number of families were affected but neither the state nor the management took long term control measures against the disease. Thus an exceptionally serious outbreak of smallpox occurred again in 1947 and 1948 in which thirty-four people lost their lives and the African hospital on the mine filled to capacity with smallpox patients.[64] Not a single miner contracted the smallpox as workers were all inoculated on engagement. To curb the spread of the epidemic, the management with government support, quarantined Africans in the compound and carried out between 30,000 to 50,000 vaccinations.[65]

What is striking about these smallpox outbreaks is that they affected almost all households. In 1955, however, this pattern was not discerned. In that year an epidemic of smallpox attacked 460 people killing seventy-eight women and children at the Roan Antelope Mine.[66] Several informants recalled that this epidemic did not affect the <u>bamakobo</u> and their families. This was corroborated by the mine's medical report in 1955:

> A serious epidemic of smallpox swept through the compound. A study carried out revealed that the epidemic

> largely affected people living in two-roomed houses and those still occupying one-roomed houses.... Smallpox, however, did not affect people in the staff section.[67]

These sentiments were again noted in 1963 when a similar outbreak of smallpox occurred.[68] It is thus clear that housing played a significant role in the spread of the disease. That smallpox did not affect people in the staff section was a result of the sanitary condition of the section and avoidance of overcrowding there.

On the other hand, insufficient housing coupled with use of communal facilities like latrines and bathing houses rendered the majority of the black community prone to smallpox. This observation may be extended to the spread of the globe epidemic of Asiatic influenza which, in 1957, afflicted 3,587 Africans at the Roan Antelope Mine.[69] According to an ex-medical orderly:

> Asiatic flu of that year sent panic in the compound among the rank and file. The epidemic largely spared those living in staff houses but was most devastating amongst ordinary families where overcrowding was endemic. The management tried to allay fears created by flu by distributing pamphlets in which the symptoms of the diseases were elaborated and Africans urged to immediately report cases of flu to clinics and hospital.[70]

The pattern whereby the incidence of influenza, smallpox and other overcrowding diseases tended to be higher among the bulk of the compound population than the African middle class also influenced diarrhoeal diseases. Insanitary conditions which promoted faecal diseases persisted in the old compound up to 1964. In fact as late as 1966, the majority of people in the compound were still using communal latrines described by the year's commission of inquiry into the copper industry as:

> Squalid, humiliating and overcrowded. A single block which may accommodate between sixty and a hundred people, generally consists of six separate lavatory units and two or three showers. The lavatories are built with partitions but without doors.[71]

Because of such "squalid" conditions the spread of hookworm, dysentery, diarrhoea and typhoid was rampant amongst low income families. By 1952, so prevalent was the spread of hookworm that nearly all Africans living in the main compound tested positive in hookworm examinations done every six months. So common was the hookworm infection that miners and their families shared their specimen so that even those free of the disease would have a chance to be treated.[72]

While every effort was made in the 1950s and 1960s to rid Mpatamatu township and the staff section near the old compound of garbage, refuse remained uncollected for weeks in the compound inhabited by low income families. The improvement in the collection of garbage from African staff residential areas which was calculated to reinforce class identity became noticeable after 1954 when sanitary services were unified on the mine and the contract with the Cartage Company was withdrawn.[73] The newly created department of sanitation ensured that refuse was removed from areas occupied by MASA members but did little to improve rubbish disposal from the rest of the compound.[74]

The sanitary conditions of the residential areas occupied by the bamakobo, coupled with the fact that they had independent latrines, largely protected them from diarrhoeal diseases. For instance, a study carried out on the mine on serious outbreak of typhoid in 1957 noted that:

> The high incidence of typhoid during the year was very disquieting. Certain facts have emerged from a study of the epidemic; firstly, the only area without typhoid was the one in which they were household latrines, one to each family. The areas worst affected were those around communal latrines.[75]

It is thus evident that African middle class families were less prone to diarrhoeal and other similar diseases because of good

sanitation and independent latrines. To the contrary, most of the families at Luanshya continued to suffer from faecal diseases whose rapid spread in the compound was facilitated by communal facilities.

At Luanshya, the pattern of diseases was completed by new diseases which first appeared on a large scale in the late 1950s. These included poliomyelitis and bilharziasis. Both written and oral evidence is scanty on these two ailments. It is therefore difficult to analyze the impact of these diseases on the African classes. However, it is clear bilharziasis was associated with infected water in the Kafubu and Luanshya rivers and that its incidence jumped from 50 cases in 1960 to 353 patients in 1961.[76] By 1964 the rate of infection of especially African miners' children who swam in the two rivers "reached alarming level".[77]

Evidence on polio, as poliomyelitis is commonly known, is also insufficient to permit analysis of its impact on classes on the mine. This notwithstanding, it is known that the most vulnerable group to this disease were pregnant women, and children aged between one and five years. According to an ex-medical orderly and ex-nurse, the most common type of polio on the mine in the late 1950s and 1960s was paralytic polio.[78]

Conclusion

This chapter has shown that the bulk of health problems at the Roan Antelope Mine in the post-war era were largely influenced by the varying working conditions of the two classes that emerged there. As the small African middle class enjoyed better working and living conditions, they were to a large extent insulated from most of the diseases discussed. In contrast, a host of diseases

afflicted the majority of Africans on the mine owing to the defective living and working conditions.

The irony of the diseases afflicting most of the compound population lies in the fact that in European countries like Britain these disease had been eradicated or brought under effective control many decades before mining began at Luanshya and Copperbelt as a whole. In Britain the eradication or control of such diseases was a result of advances in agriculture, public health and improvement in workers' income and social organisation.[79] At Luanshya these advances were applied to a limited level to the African middle class and the result was that the distribution of ill-health was offset on to the shoulders of the majority of the black community to which such advances were not extended because of the cost-conscious and profit-seeking management's labour strategy. Thus more than half of the entire African labour strength continued to suffer from health problems of which white miners and their families were largely free. It is in the light of the foregoing, that the Marxist argument that classes enjoying different levels of remuneration, housing and types of work, experience different rates of mortality and morbidity may be extended to the Roan Antelope Mine.[80]

NOTES

1. Parpart, Labour, p. 140; See also her article, "Household", p. 139.

2. For more details on this aspect see Charles Perrings, "A Movement in the 'Proletarinisation' of the New Middle Class: Race, Values and Division of Labour on the Copperbelt, 1946-1960", Journal of Southern African Studies, 6, 2 (April 1980), pp. 183-213.

3. Parpart, Labour, p. 140.

4. J.F. Holleman and S. Biesheuval, White Mine Workers in Northern Rhodesia, African Social Research Documents Vol. 6 (Leiden: African Studies Centre, 1973), p. 99.

5. See Perrings, "Movement".

6. For details on wages see Parpart, Labour, pp. 169-170; Epstein, Politics, p. 97; Powdermaker, Copper Town, pp. 89-98.

7. See Parpart, Labour, p. 49.

8. Northern Rhodesia, Labour Department Annual Report for the Year 1950 (Lusaka: Government Printer 1951), p.15.

9. Powdermaker, Copper Town, p. 5.

10. Epstein, Politics, p. 16.

11. E. Mulobela, Interview cited. See also Parpart, Labour, p. 152.

12. On housing subsidies for African senior workers see Michael Tandeo, "Wage Differentials as a Factor in Urban Housing, 1924-1953: The Case of Mufulira Town", in Shimwayi Muntemba (ed.), Zambian Land and Labour Studies, 4 (1983), pp. 44-53.

13. NAZ/SEC1/1082: Extract from Hansard, 72, (26 November 1952).

14. Northern Rhodesia, Report of the Development Authority (Lusaka: Government Printer, 1952), p. 13.

15. Rodger, "Development", p. 254; ZCCM/RACM 11/3/3D: Medical Services Annual Report, 1951.

16. Kabole Chilindi, Interview cited.

17. ZCCM/RACM 11/3/4F: Notes of discussion to consider special facilities for senior employers, Roan Hospital, 21 February 1963.

18. ZCCM/RACM 12/3/6D: Cited in a letter by W.M. Kenny to H.R. Finn, RACM, Salisbury, 13 April 1958.

19. B. Chimfwembe, Safety Officer, Interview, Luanshya, 9 March 1992.

20. ZCCM 12/3/6B: African Medical Services at Roan, 15 July 1958.

21. ZCCM 12/3/6B: Chief Medical Officer to the General manager, 28 April 1954.

22. Kabole Chilindi, Interview cited.

23. ZCCM/RACM 11/3/4F: UNIP Hospital Committee, Roan Branch to P. Fenn, 30 May 1964.

24. See ZCCM 11/3/6B/15: A. Meiklejohn, Report to NRCM, 31 December 1956.

25. F. Chilufya, Interview cited.

26. See Northern Rhodesia, Report of the Commission of Inquiry into the Cost of Living (Lusaka: Government Printer 1950), p. 219.

27. ZCCM/RACM 11/3/3D/1: Annual Report on Public Health, 1954.

28. Ibid..

29. ZCCM 12/3/6D/3: Extract from minutes of the 7th meeting of 1956 of the Mine Medical Officers' Committee, Kitwe, 26 October 1956.

30. ZCCM 12/3/6B/3: NRCM, Confidential despatch to Roselite and Amerco, Salisbury, 7 May 1957.

31. P. Malama, Interview cited.

32. ZCCM 12/3/6B/3: Extract from record of decisions of the NRCM executive committee reached at the fifteenth meeting, Kitwe, 11 June 1957.

33. ZCCM 12/3/6B/3: P.R. Stephens, Office of the Director of Medical Services to Secretary for native Affairs, 26 August 1957; Extract from record of decision reached at the 39th meeting 1957 of the NRCM executive committee, Kitwe, 12 November 1957.

34. W. Komena, Interview, cited.

35. NAZ/SEC1/1378: Secretary for Native Affairs to registrar of High Courts, 15 September 1947.

36. Z. Kasalama, Cleaner, Interview, Luanshya, 9 March 1992; P. Malama, ex-nurse, Interview, Luanshya 7 March 1992.

37. NAZ/SEC1/1338: R. Philpott to Labour Commissioner, 24 October 1947.

38. See NAZ/SEC1/1378: Acting Governor to Acting Chief Justice, 17 November 1947.

39. NAZ/SEC1/1378: Labour Commissioner to Chief Justice, 18 December 1947.

40. E. Rocky Elisala, Safety Officer, Interview, Luanshya, 11 March 1992.

41. Ibid.; B. Sampa, Interview cited; F. Chilufya, Interview cited.

42. E.R. Elisala, Interview cited.

43. Northern Rhodesia, Report of the Commission Appointed to Inquire into the Mining Industry in Northern Rhodesia (Lusaka: Government Printer, 1962), p. 14.

44. In 1962, 55.9 percent of the labour force at Roan had no formal education and only 0.4 of blacks had form two secondary school level of education. See Northern Rhodesia, Report to Commission 1962, p.44.

45. Alastair Heron, Accidents in the Zambian Mining Industry (Lusaka: Government Printer, 1967), p. 4.

46. Heron, Accidents, p. 6.

47. See Northern Rhodesia, Report of the Commission, 1962, p. 14.

48. Heron, Accidents.

49. Anonymous, "Achievements of Safety Year", Horizon 6, 2 (March 1964), p. 12; See also ZCCM, Luanshya Division, Accidents Statistics Book 1943-1991; ZCCM/RACM 10/8/9B: Minutes of the General Safety Committee, 3 November 1964.

50. See Northern Rhodesia, Interim Report of the Commission into the Cost of Living (Lusaka:; Government Printer, 1947), p. 6.

51. Northern Rhodesia, Interim Report, p. 6.

52. See Parpart, Labour, p. 109; Northern Rhodesia, Labour Department Annual Report for the Year 1946; Northern Rhodesia, Final Report 1950, p. 219.

53. NAZ/SEC1/1338: R. Philpott to Labour Commissioner, 23 January 1948; NAZ/SEC1/1367: Note for Executive, 20 January 1947. On crop failure in Central Africa, see

NAZ/SEC1/1367: Extract from Bulawayo Chronicle, 18 April 1947.

54. ZCCM/RACM 11/3/3D/1: Annual Report on Public Health, 1954.

55. Northern Rhodesia, Department of African Affairs Annual Report for the Year 1955 (Lusaka: Government Printer, 1951), p. 5.

56. ZCCM/RACM 11/3/3D/1: Medical Services Annual Reports, 1946 to 1956.

57. Mary Bwembya, ex-nurse, Interview, Luanshya, 9 March 1992.

58. ZCCM/RACM 11/3/3D/1: Annual Reports for the years 1955 to 1956.

59. ZCCM/RACM 12/7/3B/4: Cases of Kwashiorkor, Compound Clinics, 1959.

60. See ZCCM/RACM 12/7/3B/4; Federation of Rhodesia and Nyasaland Ministry of health, Mpatamatu Clinic, December 1959.

61. Benson Sinyangwe, ex-Shift Boss, Interview, Luanshya, 8 March 1992.

62. Boniface Koloko, "Its my Job", Horizon 5, 4 (April 1963), pp. 19-20.

63. ZCCM/RACM 11/3/3D/1: Annual Report 1955; Paul Musonda, ex-mine nurse, Interview, Luanshya, 10 March 1992.

64. Northern Rhodesia, Health Department Annual Report for the Year 1947 (Lusaka: Government Printer, 1948), p. 8; ZCCM 15/1/3B: L.M. Rodger to General Manager, 2 January 1948.

65. Ibid..

66. Northern Rhodesia, Department of African Affairs Annual Report for the Year 1955 (Lusaka: Government Printer, 1956), p. 5.

67. ZCCM/RACM 11/3/3D/1: Annual Report on Public health, 1955.

68. Kabole Chilindi, Interview cited.

69. ZCCM/RACM 11/3/3D/1: Medical Services, 28th Annual Report, 1957.

70. Kabole Chilindi, Interview cited.

71. Republic of Zambia, Report of the Commission of Inquiry into the Mining Industry (Lusaka: Government Printer, 1966), p. 60.

72. ZCCM 12/3/6B: A.C. Fisher, Memo to Acting General Manager, 16 April 1952.

73. ZCCM/RACM 11/3/4F/1: Medical Officer of Health to Mine Secretary, 29 December 1954.

74. Assan Lifa, Section Boss, Interview, Luanshya, 9 March 1992.

75. ZCCM/RACM 11/3/3D/1: Medical Services 28th Annual Report, 1957.

76. ZCCM 12/3/6B: NRCM to General Manager, 20 January 1962.

77. Kabole Chilindi, Interview cited.

78. Ibid..; Paul Musonda, Interview cited; Kabole Chilindi, Interview cited.

79. See Stacy May, "Economic Aspects of Health in Tropical Africa", Industry and Health 4, Proceedings of the 5th Conference of the Industrial Council for Tropical Health, Havard School of Medicine, October 29-31, 1963, (Boston: School of Medicine, 1964), p. 17; C. Fraser Brockington, Short History of Public Health (London: Churchill, 1956). For details on health problems associated with working conditions amongst British miners and other workers see Thompson, The Making of English Working Class; E.J. Hobsbawn, Labouring Men: Studies in Labour (London: Weidenfeld and Nicolson, 1964); Karl Marx and F. Engels, On Britain (Moscow: Foreign Languages Publishing House, 1951).

80. See Lesly Doyal and Imogen Pennell, The Political Economy of Health (Boston: South End Press, 1981), p. 51.

CHAPTER FOUR

CONCLUSION

This study has, *inter alia*, tried to highlight the connection between major health problems and diseases that beset African miners and their families and the conditions under which Africans lived and worked in colonial Zambia between 1920 and 1964. The study argues that ecology as well as living and working conditions were instrumental in the generation and aggravation of diseases and other health problems in the mining industry. In testing this assumption, the Roan Antelope Mine has been used as a case study for a number of reasons. The mine stood in a hostile environment with an equally hostile ecology which promoted tropical diseases such as malaria. Further, the Roan Antelope Mine not only recorded the highest rates of mortality and morbidity on the copperbelt, but also its owners encouraged African miners to bring their families to the mine right from its inception.

A number of significant conclusions may be drawn out of this study. The first of these is that the hostile ecology of the Roan Antelope Mine promoted ecologically-related ailments notably blackwater fever and malaria. Together, the two tropical diseases claimed a heavy toll of African lives especially during the first decade of mining at Luanshya. These diseases also continued to greatly contribute to high incidence of disease in the African community until the Second World War when the introduction of DDT led to eradication of mosquitoes on the mine.

The second conclusion of this study is that there was an inexorable link between disease and the policy of cost minimisation and profit maximization pursued by the RST which owned the Roan

Antelope Mine. This policy was calculated to minimise production costs by reducing expenditure on African medical care, housing, diet, safety, water supply and sanitation. Thus African living and working conditions were rudimentary, and this largely explains why preventable diseases like pneumonia, dysentery, typhoid, kwashiorkor and tuberculosis were so prevalent amongst the bulk of the African population at the Roan Antelope Mine up to the end of the colonial period.

Undoubtedly, poor health was detrimental to production. Sick miners could not be expected to be productive. With this realisation in mind, the RST initiated improvement in medical care after the Great Depression. In connection with this development, it should be stressed that the Northern Rhodesia Government hardly played any significant role. It largely left the onus of providing medical services and care to Africans in the hands of the cost conscious mine management. It should further be noted that improvement in medical services and facilities was closely tied to the policy of cost minimisation. Thus much emphasis was placed on curative or hospital-based medicine. In practice, this approach entailed provision of a modern hospital, clinics and drugs at the expense of improvement of African labour living and working conditions in which disease proliferated. It is true that this approach culminated in reduction of mortality especially amongst miners. However, the high incidence of disease remained relatively stable because conditions which induced disease did not improve enough for the bulk of the African community at Luanshya. A good example which underlines this argument is that of pneumonia. The introduction of M&B 693 in the 1930s led to the decline in pneumonia induced mortality, but high incidence of pneumonia characterised the

mine for the many years thereafter because the defective living and working conditions persisted on the mine.

In connection with the provision of medical facilities, it is also important to emphasise that the management discriminated against miners' wives and children. Until 1937, there were virtually no hospital facilities for miners' families. In the post-1937 period, the mine management began to provide medical facilities for African women and children in the mine residential areas, but even then these were inferior to those provided for African miners whose labour was of direct significance to copper production. This partly explains why both the rates of mortality and morbidity amongst miners were lower than those recorded for their wives and children.

In the post-Second World War period, discrimination in the provision of medical services assumed class proportions. Henceforth, the mine management put emphasis on the amelioration of medical attention, care and facilities for the small group of African supervisors and other educated and skilled miners and their families. For this group adequate medical attention and special facilities were rendered available. Such facilities, however, were denied to the labourers and other unskilled employees. The discrepancy in the mortality rates between the middle class comprising African supervisors and the labouring class of underground and surface workers should be sought in this discrimination.

Besides favouring the middle class in terms of medical care, the management in the post-Second World War period also improved labour conditions for African supervisors. Far-reaching improvements were effected in the housing, wages and type of work

done by the middle class. The result was that the bamakobo and their families were largely insulated from diseases like pneumonia, tuberculosis, silicosis, influenza and even mining accidents. The incidence of these health problems amongst the labouring class of African families at Roan Antelope Mine, however, continued to be very high because the cost-conscious management avoided incurring heavy costs on improvement of African housing, diet, wages and safety training for the bulk of the labour force. It is in this manner that it may be argued that the incidence of ill-health reflected class distinctions amongst the African miners and their families after the Second World War.

The final conclusion of this study is that the pattern of disease, like the conditions which created them, were dynamic. The first two decades of mining at Luanshya witnessed high rates of death and sickness among Africans mainly because of malaria, blackwater fever and diseases linked to defective living and working conditions. By the Second World War, however, the threat posed by ecologically-related diseases was contained through a vigorous anti-malaria campaign. Diseases associated with living conditions persisted during the war. These were reinforced by new ailments notably occupational maladies like silicosis, dermatitis, tuberculosis and broncho-related diseases. All these ailments and physical assaults on blacks were stimulated by phenomenal expansion in copper production. At the same time, the general decline in living conditions amongst Africans during the war gave an impetus to diseases like typhus, kwashiorkor and pneumonia. The pattern of diseases at Luanshya was completed in the post-Second World War era when other new diseases like smallpox, polio and bilharziasis appeared on the epidemiological landscape.

B I B L I O G R A P H Y

PRIMARY SOURCES

A. **National Archives of Zambia (NAZ):** Chronologically Arranged.

(i) **SEC Series**

NAZ/SEC1/1367: Food shortages, general measures 1932-1947.

NAZ/SEC1/1293: Native Labour as affecting the copper industry of Northern Rhodesia, 1935-1948.

NAZ/SEC1/1326: Labour Industry Board on Native Labour in Northern Rhodesia, 1935-1939.

NAZ/SEC1/1337: Native Industrial Labour Advisory Board Minutes of Meetings, 1935-1948.

NAZ/SEC1/1295: Sunday Labour on the Mines, 1937-1942.

NAZ/SEC1/1379: European Labour Committees on Industrial Diseases on the Mines Including Silicosis, 1938-1949.

NAZ/SEC1/69: Report on Maize Control by Secretary of Maize Control Board, 1939-1945.

NAZ/SEC1/1338: Labour Department Monthly Reports, 1940-1949.

NAZ/SEC1/1363: Report by A.L. Saffrey on Cost of Living, 1943-1949.

NAZ/SEC1/1295: Sunday Labour on the Mines, 1937-1947.

NAZ/SEC1/1378: European Labour Committee on Industrial Diseases on the Mines Including Silicosis, 1943-1949.

NAZ/SEC1/1082: Non-Government Medical Facilities, Mine Hospital Fees, 1943-1949.

(ii) **ZA Series**

ZA1/9/28/1: Epidemics and Diseases, 1926-1934.

ZA1/9/18/28: Roan Antelope Mines Ltd., 1927-1934.

ZA1/28/9: Health and Mortality on the mines, 1930-1934.

ZA1/9/82/8: Luanshya, 1932-1933.

B. **Zambia Consolidated Copper Mines Group Archives:** Chronologically Arranged.

(i) In recent years all old and new documents of the mining companies have been centralised and are kept at ZCCM Group Archives in Ndola at what was formerly Rhodesian Selection

(ii) Trust Archives. In this study all documents directly pertinent to the Roan Antelope Mine begin with ZCCM/RACM.

ZCCM/RACM WMA 1-4: General Manager to RACM, London, 1928-1930.

ZCCM/RACM W (2) HA 62: Report on Compound Conditions by Dr. A.J. Orestein, December 1929.

ZCCM/RACM 10/8/2A 1-4: Malaria Control, Prevention and Treatment 1929-1939.

ZCCM/RACM 10/7/10C/1-2: Compound Monthly and Annual Reports of Operations, 1929-1496.

ZCCM/RACM W(2) HA 64: Report on Conditions at Roan, Chambishi and Mufulira Mines, 6 January 1930.

ZCCM/RACM WMA 17/18/19: Cases of Assault, 1931-1950.

ZCCM/RACM 11/3/4F/1: Refuse Removal and Sanitation, Control of Rubbish in Town, 1931-1955.

ZCCM/RACM 10/8/2B/1-2: Native Housing, 1932-1945.

ZCCM/RACM WHC 1-56: General Cost Sheets, 1934-1935.

ZCCM/RACM WMA 192/193: Native Labour Association Returns, Roan, 1939-1949.

ZCCM/RACM 10/8/4C: Safety, Ventilation and Dust Control, Report on Roan Ventilation by Consultants, 1940-1947.

ZCCM/RACM 11/4/1C/1: African Township Advisory and Welfare Committee (ex-tribal representatives) Minutes, 1941 -1960.

ZCCM/RACM WMA 55/3: R.M. Peterson, Summary of Operations for the Six Years Ended 30 June 1945.

ZCCM/RACM 11/3/3D/1: Roan Medical Annual Reports, 1951-1957.

ZCCM/RACM 12/7/3B/4: African Medical, Welfare Clinic Reports, 1958-1962.

ZCCM/RACM 11/3/4F (No file number): Medical Services, African, Operations of Roan Antelope Mine Hospital, General Industrial Equipment, 1959-1965.

ZCCM/RACM 11/6/3B/3: Roan Medical Annual Reports, 1962-1965.

ZCCM/RACM 12/7/4C/3: E.M. Bromwich, "General Historical Roan", 1962-1963.

ZCCM/RACM 10/8/9B/4: Safety, General Safety Committee Minutes, Roan, 1963-1969.

(ii) **Miscellaneous (files).**

ZCCM 12/7/5C: Health and Sanitation, 1917-1958.

ZCCM 15/1/3B: Northern Rhodesia Mines Department Annual Reports, 1931-1949.

ZCCM 10/8/2B (No file number): Industrial Diseases Interim Report on Silicosis, 1933-1940.

ZCCM 15/1/3B (Index): Medical, Diseases, Treatment and Prevention, 1937-1950.

ZCCM 12/1/3A/2: Foodstuffs, Meat and Fish, 1939-1952.

ZCCM 12/3/6B/1: Medical Services, Operations of African Hospitals, 1941-1959.

ZCCM WMA 57/1: Medical Training, 1945-1952.

ZCCM 12/3/6B/3-4: Disease, Diagnosis and Prevention, 1956-62.

ZCCM 11/6/6B/15: Industrial Diseases, Silicosis, Pulmonary Disability, etc. 1957.

C **Government Documents**

(i) **Annual Series**

Northern Rhodesia, Annual Reports of the Department of African Affairs.

__________, Annual Reports of the Department of Labour.

__________, Annual Reports of the Department of Mines .

__________, Annual Medical Reports of the Health Department.

__________, Legislative Council Debates.

(ii) **Other Government and Company Documents**

Brelsford, W.V., Copperbelt Markets Lusaka: Government Printer, 1947.

De Lambrects, J.E. Report on an Investigation on the Copper Mines and Broken Hill with Particular Reference to Silicosis (Lusaka: Government Printer).

Heron, A. Accidents in the Zambian Mining Industry, (Lusaka: Government Printer, 1957).

Jameson, F.W. Report on African Housing in Urban and Rural Areas and Other Allied Matters: South Africa (National Housing and Planning Commission, 1945).

Northern Rhodesia, Report of the Government Unemployment Committee (Livingstone: Government Printer, 1932).

__________, Sub Committee of NILAB (Lusaka: Government Printer, 1936).

__________, Report of the Commission Appointed to Inquire into the Disturbances on the Copperbelt (Lusaka; Government Printer, 1941.

__________, Statement by Government of Northern Rhodesia on Recommendation of the Copperbelt Commission, 1940 (Lusaka: Government Printer, 1941).

__________, Report of the Committee Appointed to Examine Certain Aspects of Silicosis (Lusaka: Government Printer, 1944).

__________, Report of the Commission Appointed to Inquire into the Administration and Finance of Native Locations in Urban Areas (Lusaka: Government Printer, 1944).

__________, Interim Report of the Commission Appointed to Inquire into the Cost of Living (Lusaka: Government Printer, 1947).

__________, Ten Years Development Plan as Approved by Legco, 11 February 1947 (Lusaka: Government Printer, 1947).

__________, Report of the Commission of Inquiry into the Cost of Living (Lusaka: Government Printer, 1950).

__________, Report of the Development Authority (Lusaka: Government Printer, 1952).

__________, Report of the Commission Appointed to Inquire into the Mining Industry of Northern Rhodesia (Lusaka: Government Printer, 1962).

Pim Commission, Report of the Commission Appointed to Inquire into the Finance and Economic Position of Northern Rhodesia Colonial No. 145 (London: His Majesty´s Stationery Office, 1939).

RACM, Report of Director with Balance Sheet 30 June 1930.

Republic of Zambia, Report of the Commission Appointed to Inquire into the Mining Industry (Lusaka: Government Printer, 1966).

Sayer, R.R. and Jones R.R. Silicosis and Similar Dust Diseases (Washington: Government Printing Office, 1938).

D. **Magazines**

Horizon

Roan Antelope

E. **Oral Evidence:** Occupations of interviewees, dates and towns of interviews are indicated in the notes.

Bwembya, M.
Bweupe, B.
Changwe, P.
Chilindi, A.K.
Chilufya, F.
Chimfwembe, B.
Chola, W.
Elisala, R.E.
Kaluba, H.
Kaluba, I.
Kasalama, Z.
Komena, W.
Lifa, A.
Lukutati,
Machai, J.
Malama, P.
Mpundu, P.
Mubanga, P.
Mulasikwanda, T.
Mulenga, C.
Mulenga, D.Y.
Mulobelwa, E.
Musonda, P.
Mufumpa, D.
Nkonda, H.
Sakala, M.
Sampa, B.
Silavwe, B.
Silungwe, B.M.
Silutongwe, A.
Sinyangwe, B.
Sitembeya, B.
Sokoloko, A.R.
Unza Joint History Project.

SECONDARY SOURCES

A. **Books and Articles**

Berger, E.L. *Labour, Race and the Colonial State: The Copperbelt from 1924 to independence* (Oxford: Clarendon Press, 1974).

__________, "Government Policy Towards Migrant Labour in the Copperbelt, 1930-1945", *Transafrican Journal of History* 2, 1 (January 1972), pp. 83-102.

Bradley, K. *Copper Venture: The Discovery of the Roan Antelope and Mufulira Mines* (London: Company Publication, 1952).

Brockington, C.F. *A Short History of Public Health* (London: Churchill, 1964).

Chauncey, G. "The Locus of Reproduction: Women's Labour in the Zambian Copperbelt, 1927-1953", *Journal of Southern African Studies* 7, 2 (April 1981), pp. 135-164.

Chipungu, S.N. *The State, Technology and Peasant Differentiation in Zambia: A Case Study of the Southern Province, 1930-1986* (Lusaka: Historical Association of Zambia, 1988).

Coleman, F. The Northern Rhodesian Copperbelt, 1899-1962 (Manchester: Manchester University Press, 1971).

Coulter, C.W. "The Sociological Problem", in Davis M.J. (ed.), Modern Industry and the African (London: Frank Cass, 1976), pp. 31-127.

Daniel, P. Africanisation, Nationalism and Inequality (London: Cambridge University Press, 1979).

Doyal, L. and Pennel, I. The Political Economy of Health, (Boston: South End Press, 1981).

Epstein, A.L. Politics in an Urban African Community (Manchester: Manchester University Press, 1958).

Ferguson, J. "Mobile Workers, Modernist Natives: A Critique of the Historiography of Transition on the Zambian Copperbelt", Journal of Southern African Studies 16, 3 (September 1990), pp. 385-412.

Fisher, A.C. "40 Years of Medicine on the Copperbelt", Horizon 11, 12 (December 1969).

Fisher, M. Nswana the Heir: A Story of the Life and Work of Charles Fisher (Ndola: Mission Press, 1990).

Gann, L. "The Northern Rhodesia Copper Industry and the World, 1923-1952", Rhodes Livingstone Journal 18 (1955), pp. 1-18.

__________, A History of Northern Rhodesia: Early Days to 1953 (London: Chatto and Windus, 1964).

__________, A History of Southern Rhodesia: Early Days to 1934 (London: Chatto and Windus, 1965).

__________, Central Africa: The Former British States (Eaglewood Cliffs: Prentice Hall, 1971).

__________ and Duignan, P. Burden of Empire (London: Pall Mall Press, 1968).

Gelfand, M. "Migrations of African Labourers in Rhodesia and Nyasaland, 1890-1914", The Central African Journal of Medicine 7, 8 (1961), pp. 292-300.

__________, Northern Rhodesia in the Days of the Charter (Oxford: Basil Blackwell, 1961).

__________, A Service to the Sick: A History of Health Services for Africans in Southern Rhodesia 1890-1953 (Gwelo: Mambo Press, 1976).

Hall, R. Zambia (London: Pall Mall, 1966).

Hobsbawn, E.J. Labouring Men: Studies in Labour (London: Weidenfeld and Nicolson, 1964).

Holleman, J. and Bresheuvel, S. White Mine Workers in Northern Rhodesia (Leiden: Africa Studiecentrum, 1973).

Illife, J. Famine in Southern Rhodesia (Gwelo: Mambo Press, 1990).

Irwin, D.D. "Early Days on the Copperbelt", Northern Rhodesia Journal 1, 6 (1965), pp. 112-114.

Jones, E.B. "Some Nutrition Problems in Central Africa", Central African Journal of Medicine 2 (February 1956), pp. 62-70.

Konczacki, Z.A. "Infant Malnutrition in Sub-Saharan Africa: A Problem in Socio-Economic Development", Canadian Journal of African Studies 6, 3 (1972), pp. 433-449.

Lonsdale, J. and Berman, B. "Coping with Contradictions: The Development of the Colonial State in Kenya, 1894-1914", Journal of African History 7, 4 (1979), pp. 487-505.

Marx, K. and Engels, F. On Britain (Moscow: Foreign Languages Publishing House, 1951.

Meebelo, H.S. African Proletariats and Colonial Capitalism (Lusaka: Kenneth Kaunda Foundation, 1986).

Muntemba, M. "Thwarted Development: A Case Study of Economic Development in Kabwe Rural District of Zambia", in Palmer, R. and Neil, P. (Eds), The Roots of Rural Poverty in Central Africa (London: Heinemann, 1977), pp. 345-364.

Nash, J. We Eat the Mines and the Mines Eats Us (New York: Columbia University Press, 1979).

Ndulo, M. Mining Rights in Zambia (Lusaka: Kenneth Kaunda Foundation, 1987).

Parpart, J.L. Labour and Capital on the Copperbelt (Philadephia: Temple University Press, 1983).

__________, "The Household and the Mine Shaft: Gender Struggles on the Zambian Copperbelt 1926-1964", Journal of Southern African Studies 13, 1 (October 1986), pp. 36-56.

Pearson, A. and Mouchet, T. The Practical Hygiene of Native Compounds in Tropical Africa (London: Boillier, Tindall and Cox, 1923).

Perrings, C. Black Mineworkers in Central Africa (London: Heinemann, 1979).

__________, "Consciousness, Conflict and Proletarianization", Journal of Southern African Studies 4, 1 (October 1977), pp. 31-51.

__________, "A Moment in the `Proletarianization´ of the New Middle Class: Race, Value and Division of Labour in the Copperbelt, 1946-1966", Journal of Southern African Studies, 6, 2 (April 1980), pp. 183-213.

Powdermaker, H. Copper Town (New York: Harper and Row, 1962).

Robert, A. A History of Zambia (London: Heinemann, 1976).

Robinson, E.A.G. "The Economic Problem", in Davis, J. (ed.) Modern Industry, pp. 131-224.

Rodger, L.M. "The Development of Medical and Health Services at the Roan Antelope Mine, Parts I and II", Northern Rhodesia Journal 5 (1962-1964), pp. 135-141 and pp. 251-254.

Simon, H.J. "Zambia´s Urban Situation" in Turok, B. (ed.), Development in Zambia (London: Zed Press, 1979), pp. 1-25.

Singer, C. and Ashworth, E. A Short History of Medicine (Oxford: Clarendon Press, 1962).

Spearpoint, F.C. "The African Native and the Rhodesia Copper Mines", (Supplement) Journal of Royal African Society 36, 115 (July 1937).

Stephen, J.E.C. "The Luanshya Snake", Northern Rhodesia Journal 1, 4 (1965), pp. 13-16.

Tadesse, K. "Health Problems Resulting from Famine", in Hussein , A.M. (ed.), Drought and Famine in Ethiopia (London: International African Institute, 1976), pp. 59-63.

Tandeo, M. "Wages Differentials as a Factor in Urban Housing: A Case Study of Mufulira Town, 1924-1953", in Muntemba, S. (ed.), Zambia Land and Labour Studies 4 (1983), pp. 44-53.

Thompson, E.P. The Making of the English Working Class (London: Gollancz Ltd., 1965).

Turshen, M. "Review Article on Randall Packard´s White Plague", African Economic History 19 (19990-1991), pp. 208-209.

Vail, L. "The Political Economy of East-Central Africa", in Birmingham, D, and Martin, M. (eds), History of Central Africa Vol. 2 (London: Longman, 1983), pp. 200-250.

Van Onselen, C. "Chibaro: African Mine Labour in Colonial Zimbabwe, 1900-1953 (London: Heinemann, 1977).

__________, "Mines, Migrants and Proletariats", Journal of African History 17 (1976), pp. 146-147.

__________, and Phimister, I. Studies in the History of Mine Labour in Colonial Zimbabwe (Gwelo: Mambo Press, 1978).

Vickery, K.P. "Saving Settlers: Maize Control in Northern Rhodesia", Journal of Southern African Studies 11, 2 (April 1985), pp. 212-234.

Watson, M. African Highway: The Battle for Health in Central Africa (London: John Murray, 1953).

B. **Theses (Unpublished)**

Data, K. "The Policy of Indirect Rule in Northern Rhodesia (Zambia), 1924-1953", Ph.D. Thesis: University of London, 1976.

Henderson, I. "Labour and Politics in Northern Rhodesia, 1900-1953: A Study in the Limits of Colonial Power", Ph.D. Thesis: University of Edinburgh, 1972.

Luchembe, C. "Finance Capital and Mine Labour in Zambia and Peru, 1890-1980", Ph. D. Thesis: University of California, 1982.

Momba, J.C. "The State, Peasant Differentiation and Rural Class Formation in Zambia: A Case Study of Mazabuka and Monze Districts", Ph.D. Thesis: University of Toronto, 1982.

Mulobela, M. "The Consequences of WNLA Closure on Bulozi, 1966-1986", M.A. Dissertation: University of Zambia, 1987.

Mushingeh, A.C.S. "A History of Disease and Medicine in Botswana", Ph.D. Thesis: St. Johns College, 1984.

C. **Miscellaneous Sources**

Andelman, S.L. The New Encyclopedia Vols. 1-3 (New York: Quadrangle Books, 1973.

Balashov, V. "Pneumoconiosis Dust Research in Northern Rhodesia", in Snowball, G.J. (ed.) Science and Medicine in Central Africa Proceedings of the Central African Scientific and Medical Congress at the College for Further Education, Lusaka: 26-30 August 1963, pp. 215-221.

Gray, A. "Pneumoconiosis on the Copper Mines in Northern Rhodesia", in Snowball, G.J. (ed.), Science and Medicine, pp. 769-776.

Henderson, I. "The Copperbelt Disturbances of the 1935 and 1940", Seminar Paper, University of Zambia, May 1969.

Kashoki, M.E. "Migrations and Language Change", in Parkin, D. (ed.), Town and Country in Central and Eastern Africa Studies Presented and Discussed at the Twelfth International Conference, Lusaka, September 1972. London: Oxford University Press, 1975, pp. 228-249.

May, S. "Economic Aspects of Health in Tropical Africa", Industry and Health, Vol 4 Proceedings of the 5th Conference of the Industrial Council for Tropical Health, 29-31 October 1964. Boston: Havard School of Medicine, 1964.

Mitchell, J.C. "The Kalela Dance: Aspects of Social Relationships Among Africans in Northern Rhodesia", Rhodes-Livingstone Paper, No. 27, 1956.

RACM, Zambia's Mining Industry: The First 50 Years Unpublished. Ndola: Company Pamphlet, 1978.

__________, Accidents Statistics Book, 1943-1991 Unpublished, Luanshya Division, 1991.

The New Encyclopedia Britannica Vol. 15, 15th Edition, Chicago: William Benton, 1983.