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Labour time in South African gold mines: 1886-2006.

Paul Finlay Stewart

A thesis submitted to the University of the Witwatersrand in fulfillment of the requirements of the degree of Doctor of Philosophy

University of the Witwatersrand
January 2012

Dedicated

To whoever worked underground

and

To the memory of an unsung hero

The Reverend Canon Dale St John White

who initiated the re-unionisation of black mineworkers in the 1970's

and

To the memory of my father

The Reverend Canon Dennis Finlay Stewart

whose pastoral labour time knew no bounds.

Declaration

I declare that this thesis is entirely my own work except where otherwise indicated. It is submitted for the degree of Doctor in Philosophy in Sociology to the University of the Witwatersrand.

This thesis has not previously been submitted for any other degree or examination to any other university or seat of learning.

Approximate number of words: 120 000 (excluding Footnotes, Bibliography and Appendices)

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Paul Finlay Stewart

25th January 2012

Abstract

The core question of this thesis is why working time in South African gold mining has been so stable and addresses the significance of this fact. The working or labour time of miners and mineworkers is shown to have been remarkably stable for a century since 1911. By construing the length of the migrant labour contract as a measure of labour time, which systematically lengthens over the same period until it aligns with the annual rhythm of industrial working time, the evidence is provided for the argument that labour time constitutes the hitherto unrecognised foundation for the exploitation of mine labour in the South African gold mines. The phenomena - and importance for value-creation - of both relatively long, stable industrial working hours and the ever-longer migrant labour contracts over a century, are explained in terms of the value labour power creates in the mining labour process, as well as how the sheer expenditure of extended periods of labour time create the necessary skills mining requires. The fortunes of the platinum mining sector largely follow suit. Whereas the revisionist literature focused on the ***acquisition*** *of a mine labour supply, this thesis argues that the* ***retention*** *of mine labour, by way of extending, intensifying and sustaining labour time in mining production, completes our understanding of its exploitation. It does so by employing a value-theoretic analysis which reveals the* ***genesis of value creation*** *in productive social class-based relationships. It shows how a series of qualitative, socially constructive effects, intra-working class occupational differentiation for example, emanate from the very expenditure of labour time underground when measured as a quantitative amount of labour time. It is argued that the substantive study of labour time has been surprisingly ignored in Marxist theory within which it plays a central role in the labour theory of value. A range of research methodologies have been employed to make this case. An ethnographic participant observation research method was aimed at articulating an agent-sensitive approach. The candidate lived in the hostel compounds and worked underground with mining personnel and has been both subject to the working time regimes on the mines as well as having actively participated, via various forms of research, in dealing with restructuring and changing working time schedules. The thesis goes on to show in close empirical detail, informed by actual experience and adopting a triangulated research methodology, how working time arrangements within which labour time is expended, remains immured in complexity. Why capital and labour, for instance, adopt competing stances regarding the restructuring of working time arrangements is explained. I conclude that workers' production demands need to be taken seriously when working time is restructured in mining.*

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I know I have invariably left out more than one person who deserves my thanks. I do apologise.

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1 Labour time in South African gold mines

> *Time ceases to be the measure of life and becomes life by being textured into the web of productive relations.*
> Irena Boca on Antonio Negri's conception of time (2008:136)

The core argument of this thesis is that, both historically and in contemporary society, labour time - the time spent at work - is foundational to, structures and dominates social life. The expenditure of labour time is necessary for satisfying basic needs and is responsible for the artifactual production of all societies. All societies must, in addition, through the collective expenditure of labour time, produce an economic surplus in order to survive. Labour time, it will be shown, consequently reveals itself as the archetypal socially constructive force, powerfully structuring human society. Changes in the very conception of life, the experience of time itself, the shape of social practices and orders, as well as the formation of social classes, each fulfilling various temporally bound social duties and obligations, took shape around the expenditure of labour time.

These bold claims are justified and illustrated by examining one specific exemplar over an extended period of time. The time mineworkers have spent labouring, ever since gold was discovered in South Africa, is examined in detail. It is hence the value and surplus value-creating capacity of the labour power of mineworkers, expended over time, which is the topic of this thesis. In the historical literature on mining in Southern Africa, there is, importantly, 'almost universal consent' regarding the remarkable stability of labour policies (Yudelman & Jeeves 1986:103). By outlining labour's struggle over time spent working on the mines and the mining industry's policy and practice regarding working time arrangements, what follows below will confirm this generally accepted dictum in the literature. Yet the stability, in labour policy overall and with regard to working hours in particular, has been merely noted, not explained (see Lundall 1990; Lewis 2001). The focus on labour time aims at filling this explanatory gap in our historical understanding of value -creation in gold mining, widely accepted as the economic foundation of industrialisation in South Africa (Fine & Rustomjee 1996). The core question of this

thesis then is why working time in South African gold mining has been so stable. Its aim is to address this fact and explain its significance.

The analysis to be presented is confirmed by and further illuminates the case of platinum mining, which is set to be the central extractive industry over the century to come, with significant economic and social consequences for Southern Africa and its peoples (Bonner & Stewart 2007). In this mining sector, working time arrangements have recently been in contention between company management and organised labour, with labour unions now organisationally united across the historic racial divide. The explanation for this solidarity at the organisational level in a racially divided working class on the mines, it will be suggested, finds its material and foundational basis in the temporal structuring of labour time expenditure.

There are two immediate reasons which structurally frame the extraordinary stability of working time arrangements in gold mining. Firstly, the geological features of the hard quartzite rock in South African deep-level gold mining constitute an often noted ecological given (Johnstone 1976). Full mechanisation at the rock face in gold mining has consistently failed to prove practically feasible. Geological formations have powerfully constrained and limited the technological development of one of the primary technical forces of production, which remains driven by direct human labour-power. In the geo-physical and socio-technical environment of the stoping[1] rock face, in the gold and platinum mining sectors, production continues to rely on the hand-held machine rock drill. With full mechanisation held back, the mining industry sees the continuation of aspects of 'primitive'[2], absolute forms of surplus value extraction (Marx 1977:299) and the consequent sustained maintenance of relatively long working hours. (This was, it should immediately be noted, not the case on the collieries which were mechanised in the 1920's and both continuous operations and regular five-day working weeks can currently

[1] The stope is the name for the working area where mining the ore-bearing reef takes place.

[2] Primitive forms of accumulation, it has been argued, are a permanent feature of capitalism (Bonefeld 2001; De Angelis 2001).

be found. Open-cast platinum mines invariably run continuous shift systems seven days a week).

The recently established democratic government, moreover, has proved unable definitively to print its rights-based promulgations over the force of the arguments regarding the geological and technological constraints defining the economics of mining production and the challenge of transforming racialised social relations. The new dispensation has not always been able to enforce legislation reducing working hours in mining, with many mineworkers still often spending 48 (instead of 45) hours a week, underground. Social contestation over the length and configuration of working time consequently continues. It has proved more difficult for organised labour to reduce working hours than to improve wages for nigh on a century. Given that real wages for labouring black mineworkers did not rise from 1911 to 1969 (Wilson 1972), the significance of this fact is taken as self-evident.

Secondly, working time proved to be the single critical issue directly under the control of the mining industry. Neither the vicissitudes of its ore-body, the price of its commodities, particularly gold, nor its ever fractious labour supply - despite early control over 'compounded labour', the central plank in a raft of political and administrative mechanisms under colonialism, segregation and apartheid - was ever satisfactorily under the industry's direct command. Even 'working costs' were 'determined by social and economic forces' which 'often lay only marginally' under the control of the mineowners (Jeeves 1975:6). Since 1911, when legislation for the 48 hour working week was promulgated, there have been negligible changes in the distribution and configuration of working hours. The 48 hour working week this legislation introduced remained in place until the Basic Conditions of Employment Acts of 1997 and 2002, which reduced the working week to 45 hours. While this reduction in working hours applied equally to the mining industry, many workers remain underground for 48 hours a week. Currently the platinum mining sector follows suit in denying reduced hours in working time schedules acceptable to the majority of the mining workforce.

These two structural features, difficult geological conditions and the only aspect of mining directly under the mineowners control - working hours or labour time in other words - occurred within the specific social context and the broader social conditions in which mining took place. Under these conditions, initially colonialism and then later segregation and apartheid, the subaltern character of these societies permitted the untrammelled exploitation at low wages of those of Southern Africa's indigenous people who ended up working in the mines. While things have improved over a century, low wages and long working hours continue even after the advent of democratisation in 1994. What is extraordinary is the extent of the length and stability of the labour time, not only these African workers, but all workers, spent working on the mines. Even the original, skilled, white European craft workers - and white miners who later organised themselves into trade unions - worked long hours by way of a seven-day week until well after the promulgation of the Mines and Works Act of 1911 which stipulated a six-day, 48 hour working week. Since then, working hours for underground mining personnel have not meaningfully changed.

Historically, in a racially structured society, the industry's main reason for consistently rebuffing the demands of organised white labour for shorter working hours was that reduced working time would have a significant impact on the productivity of African labour. These workers have always spent inordinately long working hours underground. It will also be seen that they have, in addition, consistently served increasingly long migrant labour contracts over the decades. With the gradual dissolution of the labour contract served by African workers, their new contracts eventually aligned with traditional annual industrial working time cycles negotiated by white trade unions with mine management. Currently, for instance, 93% of National Union of Mineworkers (NUM) members, are on 'permanent contracts of employment' (Buhlungu & Bezuidenhout 2008:17).

A further major reason for long working hours in mining is the extensive porosity of the working day. Not all time can be spent working, travelling time underground, for instance, increasingly consumes and erodes time for production within the working day. This factor too materially frames the long working hour regime. In addition to this, both

avoidable and unavoidable delays result in wasted time spent underground. Rock falls and rock bursts, labour shortages, problems with machinery and a range of other dysfunctions in the social organisation of production, often largely due to managerial inefficiencies, further contribute to mining requiring and maintaining a relatively long working hour regime.

As a result of this clutch of factors, the noting of which recur throughout this thesis, the industry has advanced numerous arguments, which echo over the century, in order to maintain long working hours. Recently, arguments regarding the necessity of increasing production time, in order to maintain both labour and capital productivity, were again rehearsed on the platinum mines and will be discussed in Chapters seven and eight. Further, reducing working hours will be shown to have a direct, though complex and not unambiguous bearing on the critical matter of poor occupational injury and safety statistics which have long plagued the industry.

I will attempt to show, *in lieu* of the complete re-organisation of production, as mooted by the mining industry in the late 1970s, why reducing labour's working hours has not been possible. To use Marx's classic formulations (1977:476-485), co-terminous with relative forms of surplus labour extraction (by introducing machinery and intensifying work), absolute surplus value extraction (extending working time and maintaining low wages) remains foundational for generating an economic surplus and remains to this day, at least at the rock face, the primary source of wealth creation and profits. The uniquely qualitative, value-producing capacity of labour-power under capitalism and the role labour time specifically plays in mining production explain, I argue, the vigorous defence, by successive mine managements, of maintaining a stable and relatively long working hour regime.[4]

[4] In Australia 'long working hours' has been defined as '45 hours a week or more' (van Wanrooy and Wilson 2006:350). Another source cites 'above 40' as defining 'long hours' (Campbell 2005:2).

Much more broadly, from a scholarly perspective, the significance of labour time in South African mining, as well as the impact of the working time arrangements attending its expenditure, has been little understood. This has resulted in the social significance of labour time being largely ignored in academic work, both at home and abroad. It is, importantly for instance, still widely accepted that the maintenance of low wages[5] is the key indicator of the exploitation of labour in South African mining. In fact, without 'large numbers of low-wage, unskilled migrant workers', 'there would never have been a deep level gold-mining industry in South Africa' (Crush *et al* 1991:1). This view is eclipsed, however, by foregrounding labour time as both foundational to profitable mining and a key explanatory concept in understanding the developmental trajectory of mining in Southern Africa, both historically and in the contemporary period.[6] This view focuses analysis back to the production of surplus value in the context of a harsh geology, stalled mechanisation at the mining rock face and the recognition of working or labour time as the sole matter under the industry's direct command in an ever-fraught social organisation of production. This production-orientated view stands in contrast to the traditional focus on the realm of reproduction and the 'subsidisation' of wages due to African mineworkers' access to the countryside. The consequences for scholarly analyses of South African gold mining are potentially significant.

The study of labour time, it will be argued, has suffered neglect. The interrogation of the concept of labour time and the examination of the working time arrangements that instantiate it, will contribute to completing our hitherto only partial analysis and explanation of the simultaneous exploitation of mineral resources and mining labour.[7] By

[5] Harold Wolpe's 'cheap labour thesis' (1972), the original and much-quoted source foundational to the Marxist revisionist tradition, has again (see Crush 1992:50) been criticised for a different set of reasons (see Alexander 2006). It retains much of its cogency, with wages for black mineworkers still being low.

[6] Labour time is often ignored. Roediger and Foner decry the tendency of historians to treat the American 'shorter hours movement' as a 'secondary adjunct of wage disputes' (1989:vii).

[7] I follow Allen Wood's interpretation of Marx's construal of exploitation (of labour) as expressed in his entry in Ted Honderich's *The Oxford Companion to Philosophy* and which is devoid of moral content: *'Marx conceives the justice of economic transactions as their correspondence to or*

the same token, our understanding of the significance of the source of South and Southern Africa's industrially created wealth will be deepened. In order to do this, what follows traces and links only the high points of the hitherto unwritten history of working time arrangements in the South African mining industry[8] in order to explain the historic significance and contemporary importance of the extraordinary stability of working hours.

The explanation for the morphology of labour time (measured in terms of hours, days, weeks, months and years) stands in close relation to the three factors of difficult geology, the stalled rock-breaking technology in the labour process and the industry's control over working time. South African gold mining currently involves the socio-technical challenge of delivering - by hoist - the entirety of human and physical resources often down to considerable depths - currently to over 3,5km and sometimes 4km underground in gold mines. This was the singular challenge underlying making the South African gold mines profitable from the very earliest days. The working time arrangements under the industry's control this production scenario currently requires, often effectively a 48-hour working week, provides its key producers - workers, operational supervisors and even many underground managers - with minimal temporal flexibility. Many mineworkers, sub-contracted workers especially, work considerably longer hours. The complexities attending the social organisation of work and the restructuring of working time schedules in particular, continually recur, despite changing broader societal and political conditions and result in a series of contradictory effects. Shorter hours implemented in experimental pilot projects have often resulted in greater productivity, but not always resulted in safer mining and have always been discontinued. Where an important occupational group of

functionality for the prevailing mode of production.' To clarify, in order to distinguish between the technical definition of exploitation held by Marx, as opposed to the commonly held moral sense in which it is often employed, Wood explains: *'Given this conception of justice, Marx very consistently (if rather surprisingly) concluded that the inhuman exploitation practiced by capitalism is not unjust, and does not violate the workers' rights: this conclusion constitutes no defence of capitalism, only an attack on the use of moral conceptions within the proletarian movement'* (Honderich 1995:526).

[8] Lundall's note almost two decades ago, for instance, that 'the history of campaigns for shorter working hours in South Africa still remains to be written,' still applies (1990:64).

workers exercised increased autonomy and control over the labour process and proved their capacity to increase production by improving labour productivity to win more 'leisure', or - to use Marx's terms - disposable or 'free' time (1973:711), their desperate efforts resulted in more injuries until they adjusted to the new regime. In short, the central role of labour time, not only as a socially available resource under given societal formations, but rather especially within production, is uncovered as the previously occluded independent variable, around which a more adequate understanding of gold and platinum mining in South Africa crucially turns, not only in the workplace, but also beyond it.

In order to realise these contentions, this thesis analytically disaggregates the concept of labour time within the mining labour process. It does so by applying Eric Olin Wright's value-theoretic analysis (1981) of the working day in the conceptual light of a sociological perspective, initially presented by II Rubin (1972) and discussed in a different register by Pitirim Sorokin (1943), but which is elaborated in detail by a controversial reinterpreter of Marx's basic conceptual categories, Moishe Postone (1993). While Rubin does not discuss labour time *per se* and Sorokin contrasts time construed qualitatively and quantitatively and argues that considering time solely in its modern guise as quantitative is inadequate for examining sociocultural phenomena, Postone explicitly points to the *qualitative* effects of the *quantitative* expenditure of time. In other words, time, even where it is construed as linear and measured in quantitative terms - hours, days, months, years and labour contracts - results in qualitative, social effects. This insight is central to this thesis. The sheer (quantitatively measured) amount of time some workers spent on the mines, for instance, had the social effect of differentiating those workers from others by virtue of the skills they learned while on the mines. For Postone, the *qualitative* effect of the *quantitative* expenditure of time refers particularly to labour time (1993:186ff). As critics have pointed out, however, in a complex work couched at a high level of abstraction, Postone refers to the labour time of *people* in society in general, and not specifically to a working class whose labour time is the focus of this work (Arthur 1994:152; *Aufheben* 2007:31). By drawing on specific, contemporary Marxist debates around the notion of *value* - the measure of which under capitalism is taken to be labour

time - I further delve into Marx's notion of 'socially necessary labour time' in seeking an explanation for maintaining long hours in the local mining industry.

This work consequently tracks working time arrangements in mining over the past twelve decades and subjects the length of the working day to a value-theoretic analysis. This analysis reveals the origin of surplus value extraction in the mining labour process in the context of the geological constraints of South African mining, stalled mechanisation at the rock-face, the changing organisation of the labour process and the racialised character of its social relations (which mirrored the shape of successive societal forms on the surface above it). In this context, the industry exercised its control over working time, thereby explaining the necessity of sustaining long working hours over a century.

I explain how the contested organisation of the labour process and its rock-breaking technology implicates both capital and labour productivity and has been dependent on labour time expenditure and a stable, relatively long working time regime. Existing accounts of the mining labour process illustrate how the social relations attending it have historically been powerfully shaped, from the earliest days, whether it was by coercion and violence from the late 19th century until the 1960s (Breckenridge 1998; Moodie with Ndatshe 1994, 2005); with motivational incentive and bonus schemes, especially from the late 1950s to the 1980s (de Vletter 1981:112; COMRO)[9] or attempts since the 1990s focusing on co-operation and team work (Davies & Head 1995; Webster *et al* 2001; Phakathi 2001, 2011). None of these initiatives yielded to reducing working hours as an option. When continuous working arrangements were attempted in the 1990s to boost productivity and save jobs, they did not, moreover, achieve their desired effect, a matter which receives attention in Chapter seven.

[9] Numerous reports - of the Human Sciences Laboratory of the Chamber of Mines Research Organisation (COMRO) attest to the extent of the research conducted in these fields, noted also by de Vletter (1981:112). The following COMRO reports are of particular interest: Jensen 1965, 1969; Glass 1967; Lawrence 1969; Lawrence & de Ru 1970; Mauer 1972, 1975; Momberg & Pheta 1975; Rodenwoldt 1982.

This thesis consequently seeks to foreground both the fact and reasons for the stability of working time by rooting an explanation in an analysis of the temporal components of the mining working day. The analytic categories corresponding to these temporal components reveal the relation between (surplus) value creation and these temporal components to which specific forms of social contestation are linked (Wright 1981). I aim to draw out a number of the implications emanating from this analysis for both our historical and contemporary understanding of social relations in the mining industry.

The scholarly tradition, both liberal and Marxist or Neo-Marxist, has attempted to explain the exploitation of mining labour under capitalism largely in terms of the intersection of race and class and which manifested itself in specific configurations of political formation at the level of reproduction and the patently unequal distribution of mining wealth. I propose to deepen such explanations by bringing the valorising imperatives of capital accumulation within mining production and the role of labour time into focus. More specifically, I wish at least to begin to fill the gap identified by Legassick in his criticism of Wolpe (1972) when he argues that:

> With much of Wolpe's criticism I concur, though his analysis seems to pass over some crucial issues.... assuming that the prime imperative is the reproduction of a cheap labour-force, while true at some general level, is an over-simplification of Marx's understanding of the dynamic process by which surplus-value is created under conditions of increasing productivity of labour (1974b:9).

The role of labour time in the genesis of the creation of surplus value will constitute the focus.

***

Two quotations from very different theoretical traditions explicitly stress the crucial importance of the category of time for understanding society in general and capitalist society in particular.

> Few factors in a culture express the essential nature of its world picture as clearly as its way of reckoning time: for it has a determining influence on

> the way people behave, the way they think, the rhythm of their lives and the relationship between them and things (Gurevich 1972:94).
>
> The only form of wealth that constitutes capital is one based upon direct labour time expenditure (Postone1993:34).

These are strong claims for the significance of time and labour time. The paucity of research on working time is consequently surprising. For working time issues were historically the impetus to the first trade unions, the first labour legislation and the celebration of May Day. The experience of American labour, for instance, boasts an impressive number of 'firsts' regarding the importance of a reduction in working hours.

> The reduction of working hours constituted the prime demand in the class conflicts that spawned America's first industrial strike, its first citywide trade union councils, its first labor party, its first general strikes, its first organization uniting skilled and unskilled workers, its first strike by females and its first attempts at regional and national labor organization (Roediger & Foner 1989:vii).

While struggles over working time were prominent in the early history of the labour movement here at home, in the largest strike in the history of South African mining in 1987, working time issues were raised neither by the unions as a demand, nor by the industry by way of offers to negotiate an end to the strike. This was despite the fact that the real sticking point and trigger of the power struggle that ensued between capital and the recently emergent independent black, mass-based trade union movement was how the holiday leave allowance - a pre-eminently labour time matter - was treated during the negotiations (see Baskin 1991:225ff).

The extent, magnitude and *prima facie* importance of the issue at hand - the quantity of labour power expended historically in South African mining - is illustrated by two brute calculations of human labour in terms of labour time. Specifically referring to the labour time expended on the South African gold mines, Ernest Mandel calculated that over a century ago, in 1907, the number of working years, representing the total quantity of the labour time expended by the mining workforce, stood at 183 000 years, to rise to 400 000

years by 1940 (Mandel 1978:422-3). Francis Wilson calculated, after interruptions in mining during the Second World War, that between 1946 and 1975, 'the number of man-years worked by black mineworkers was approximately 10,7 million. In gold mines alone the totals were '10,4m black and 1,3m white, man-years' (Wilson, 1976:37).

Recently, organised workers have again challenged the unequal appropriation of the economic surplus, created in production through the mechanisms of both working long hours and continuous working time schedules, by arguing for more positively efficient ways of doing their jobs to save time *at* work, in order to win time *away* from it. Increasing numbers of sub-contracted workers, moreover, spend even longer hours underground, are unprotected and poorly positioned to challenge exploitative relations at work (see Bezuidenhout 1999; Crush *et al* 2001).

The significance of one particular statistically representative research finding - unusually not contested by management and labour - that safety on a platinum mine (in a fatality and injury prone industry) improved by over 50% by reducing working hours, fully justifies in the mind of this writer the need for careful exploratory theoretical and empirical scrutiny of a moment in the clearly definable object of social scientific study under review here.

The thesis consequently entertains a series of both practical and theoretical questions clustered around the following core research question: *Why has working time in South African mining been so stable and what is the significance of this fact?*

The central themes treated in formulating a response to this question relate to the manner in which labour time been expended underground; the factors necessitating relatively long hours worked in South African mines; the preferences expressed for particular working time arrangements by workers, supervisors and managers; and the changes organised labour has proposed and the productivity improvements they have actually achieved in certain instances in the quest to reduce working hours and why such preferred options (and increased productivity) have been resisted by mine management.

The thesis further notes the way in which the working time of the increasing numbers of sub-contracted mineworkers is currently being ignored - by not being measured, monitored and controlled - and thus needs further research. It suggests, following Marx and a number of contemporary writers, that absolute surplus value extraction - the extensive prolongation of the working day - remains at the heart of mining production. This signals the reintroduction of aspects of pre-industrial patterns of industrial organisation which are out of kilter with the global expansion of modern, rights-based democratic dispensations.

The question arises whether mining under current managerial systems is destined to remain 'primitive' and characterised by long, but regular working hours, or whether the currently contested 'continuous operations' working time regime and shorter, but irregular hours for the individual worker, will prevail. Answering this question has implications for understanding the long-term prospects of profitable deep-level mining in South Africa, the role and value of labour, the conceptual characterisation of workplace regimes and the critical matter of safety in mining. Going beyond the confines of this work, this last issue is increasingly a requirement of international equity investors in the South African mining industry.

It is an explicit assumption that this thesis raises considerably more questions than it provides answers. Indeed, this thesis arguably potentially opens up a new research programme devoted to exploring the manifold theoretical and empirical ramifications issuing from an understanding of the importance of labour time expenditure.

The concept of labour time is prominent in classical economics, yet attains its definition and fuller articulation in the critical political economy of Marx. From this tradition, therefore, a range of theoretical issues are addressed and the beginning of an integration is articulated in what follows.

This thesis shows how, in the literature devoted to 'the sociology of time', time itself is shown to be both historically and socially constituted and to have socially constructive

and causal capacity. More pointedly, in order to provide theoretical foundations for explaining the stability of working hours and the role of labour time, Marx's theory of value is interrogated insofar as the measure of value and the role of labour time is a matter again on the agenda of Marx scholarship (see Bonefeld 2010).

If, for instance, a very different kind of theorist such as Moishe Postone (1993), whose political orientation and work is hotly debated (Arthur 2004; Bonefeld 2004; *Aufheben* 2007), is correct insofar as he construes direct labour time as the pre-eminent quantitative and qualitative measure of value, the genesis of economic value creation must be seen as rooted in production. However, by Postone's own admission, there is in his work no further advance into analysing actual labour time expenditure in production, despite the highly suggestive final chapter in his core text entitled 'The trajectory of production' (1993:307-384). A focus on production will show how his own arguments lead to what his major work ignores, as his critics have strongly pointed out, namely the continuing centrality of class struggle under capitalism,. This is most particularly the case, I argue, when the time which labour-power is directly expended in production falls under the spotlight.

A fresh analysis of the core mining production process is enabled when the concept of labour time is disaggregated into its various conceptual categories and value components, via Wright's conceptual model (1981:67). I attempt to locate a production-centred reading of value in the seemingly interminable debate around Marx's value theory - the thesis, expressed as a social law, that the expropriation of the productive use of human labour power, central to the creation of material wealth, fundamentally structures the contours and substantive content of capitalist society. The historical and empirical grounding of this analysis sheds light on a range of issues.

In order to reveal the epistemic adequacy of this approach, the stability of working time, the value-creating capacity of labour-power expended over time, the logic behind workers' and individual managers' preferences for particular working time arrangements (and the nature of work and the social relations such work presumes and entrenches), as

well as the complexity of changing working time schedules as demanded by organised labour, will come into focus as pertinent issues. By disaggregating the different elements of labour time, time *per se* will also come into greater focus, much in the same way as time lost part of its socially invisible character when timed-labour made time itself 'visualisable' by making it 'increasingly reified, standardised, stabilised and rationalised' under industrial conditions (Doane 2002:5). For, generally speaking, 'capital hides "its genesis" and thereby 'makes its human content invisible' (Bonefeld 2004:111). The point is to uncover what lies beneath this mask.

For as soon as timed-labour is analysed in terms of its temporal components and related to forms of social contestation and which temporal components are responsible for the creation of surplus *value*, the necessity of maintaining the stability of labour time and its regulation and the nature of the social relations attending such, come more clearly into view. It matters not whether the struggles over value-theoretic categories of the working day are analysed as intrinsic to maintaining capitalism or as challenging its very foundations. Simply put, the *internal* dynamics of exploitation (and the ways in which this is contested) need to be seen in the '*specific way* in which exploitation occurs' (my emphasis) (Bottomore 1983:157). I take this specificity to mean *within* capitalist production relations and not to refer to the broader macro-political and social mechanisms under capitalism - which may be logically and historically prior to and create the social and political conditions for the actual creation of economic value in production. (For instance, the Chamber of Mines regulation standardising hours in 1896 will be shown to constitute a foundational condition for the exploitation of labour). Both the social conditions for and the *effects* of this specificity have dominated historiographic work regarding mining in South Africa and assumed the focus of much analysis. The conceptual grinding of a new temporal lens permits the viewing of the internal dynamics and genesis of exploitation within capitalist production, its attendant social relations and the emerging shapes of resulting social effects. This is not to adopt a crude mechanical, 'productivist' or 'vulgar' economically deterministic viewpoint. On the contrary, it is to show how the expenditure of labour time, the struggle over its regulation and organisation, and the socially structuring institutional shapes it assumes, frame the

experience of labour time, shape contestation over it and define important aspects of social relations within the mining industry and beyond.

Moishe Postone contends that the 'essential structuring of social forms of capitalist society' is explained by 'their temporal dimension and quantifiability' (1993:186). While I want to pick up and explore this claim, I specifically note that Postone has couched his analysis at a high level of theoretical abstraction, repeatedly admits as such and concedes that it needs to be 'more fully developed' (1993:21). One collective group of critics, while recognising 'its erudition', ' all its cogent arguments' and that his work is 'somehow in accord with our theoretical and political project', correctly stresses that any theory 'needs to confront reality to sustain its feasibility' (*Aufheben* 2007:1,2). This Postone has not yet done. He admits his analysis is the 'initial stage' of a reinterpretation of Marx, not even a full exposition of a critique, 'much less … a developed theory of contemporary capitalism', let alone one which engages with empirical reality (Postone 1993:21).

With this noted, by applying insights from Postone's analysis to the labour process in terms of Wright's schema, this thesis empirically applies key insights of his abstract theoretical 'reconstruction of Marx's core categories' in a historical and contemporary conjuncture. It shows, moreover, that key aspects of Postone's abstract analysis can be instantiated by a classical rendering of Marxist class analysis more adequately than the generalised view he espouses of the importance of the labour time of society at large which is ostensibly responsible for how labour 'mediates' social relations in capitalist society.

If labour time is important in understanding social relations under capitalism, it has further been suggested the organisation of 'socially necessary labour time' is *the* question (Thompson 1983:41). Yet, while foundational to valorisation and Marx's analysis of capital, if labour time, *qua* concept, has remained conceptually undeveloped, particularly with regard to theorisations of the capitalist labour process, the complex notion of 'socially necessary labour time' has also suffered this fate. I explore this contention, and suggest that much of the detailed empirical research inspired by the largely defunct body

of labour process theory might be revisited in relation to the central matter of labour time in general and socially necessary labour time in particular.

Marx's well-worn distinction between absolute and relative surplus value extraction is central to any discussion of value and the expenditure of labour time. In the South African context, Eddie Webster usefully employs this distinction to frame his grounding study on the labour process and analysis of deskilling in manufacturing (1985). This distinction is the starting point for developing an explanation for the stability of labour time and working time arrangements in gold and platinum mining. Applying and developing this distinction further potentially provides a more complete explanation for the current trend of sub-contracting (see Bezuidenhout 1999; Bezuidenhout & Kenny 1999; Bezuidenhout 2006; Bezuidenhout & Buhlungu 2006). These scholars are particularly concerned about the impact and effect on the organised labour movement of flexible or casualised labour - sub-contracting especially - in the context of globalisation. The social necessity of the precarious forms of labour they treat, in terms of their location in production, however, is not explained, but merely described. It is well-established that sub-contracted mineworkers work for less pay and under worse conditions, and lack the usual benefits, as well as working longer hours than permanent miners (Crush *et al* 2001). But the point is this. Unable to mechanise, and introduce significantly new technologies in the core business of stoping[10], profitability does not depend simply on minimising costs generally and improving productivity by reorganising organisational systems and production relations. Profitability in mining is, rather, at a more fundamental level, explained in terms of decreasing socially necessary labour time. This is done in especially two ways, both associated with absolute forms of surplus value extraction where relative forms of surplus value such as mechanisation are not readily at hand: the depression of wages (and wage reductions) and maintaining long working hours. Capital can only implement such strategies where working class organisation is weak, or, in too many instances, where it is virtually non-existent insofar as extending the frontiers of control over the labour process underground is concerned.

[10] As Moodie correctly avers, stoping is 'the most difficult and labour-intensive part of South African mining' (1994:50).

Furthermore, continuity and change in the arrangement and organisation of working hours is absent from sociological analyses of the workplace regime in South Africa. The recognition and importance of the unbroken passing of collective labour time as fundamental to the mode of exploitation rooted in production in the mining workplace is not adequately captured, if at all, in the conceptual characterisations of primarily manufacturing labour processes. These conceptualisations have strongly implied, or have at least been taken as having general applicability beyond the sites out of which they emerged.

Southern African workplace regimes and their attendant social relations have been variously described as 'colonial despotism' (Burawoy 1985), as 'racial capitalism' (Webster 1985), the 'Apartheid' and 'Post-Apartheid' workplace regimes, (von Holdt 2000) and the 'post colonial' workplace regime (Bezuidenhout 2004). While Bezuidenhout (2004:37), following Burawoy (1985:235ff), acknowledges continuity in despotic practices across differentially characterised (post-colonial) historical periods, the matter of labour time and its implications for conceptualising, explaining and understanding the nature of workplace regimes is entirely missing from these descriptions and analyses of workplace regimes and requires analytical remedy. The remedial strategy will be to provide an explanation for the necessity and the implications of time spent at work in underground mining contexts. In brief, quite apart from the manifold and recurring dysfunctions and often general *disorder* in production also found elsewhere (see von Holdt 2000), material and labour shortages most particularly, the requirements for profitability[11] under given geological conditions and stalled mechanisation require the extended employment of labour time, and reveal the material conditions powerfully shaping the form the mining workplace regime and its social relations assume.

[11] The role the monopoly price structure of gold - throughout most of the twentieth century - in essentially eliminating competition, which acted as a brake on the transition to a generalised relative surplus value extraction regime, has not been integrated as a factor into this thesis. I am indebted to Lucien van der Walt for pointing this out. My key argument, however, is that mechanisation at the stope face still currently remains the unrealised dream of mining engineers.

The tacit skills and practical working knowledge and experience of the full panoply of underground workers and supervisors, it will be intimated, are considerably more broadly employed than the leading account in this regard brilliantly shows in relation to physically labouring workers (Leger 1992). By broadening Leger's analysis and recognising the practical cognitive and indeed 'tacit' skills of white supervisors in allusions to the labour process throughout this thesis, the focus on understanding the mining labour process in this way will exemplify the shift in analysis from race back to class.

Dunbar Moodie's critique (2005) of Breckenridge's (1998b) explanation of violence in mining, couched in terms of the 'maximum average system', can be reinterpreted in terms of labour time. By way of brief illustration, the maximum average system, which sought to eliminate competition for African labour within the industry, gain control over it and prevent the 'danger of wage hikes for black workers', was fully instituted in 1912 (Moodie 2005:563). This occurred after a number of years of acute labour shortages and when the supply of African labour to the mines was in turmoil, with labour recruiters, touts, rural headmen, mine police and *indunas* (working under cover of the 'voluntary system') were all competing for this valuable resource (Jeeves 1985:153-183). The 'maximum average system' can be seen as the industry's attempt to minimise socially necessary labour time and its social expression as the wage, which was fixed at the rate of 2s/3d at the time, yet breached by mine managers nevertheless (Jeeves 1985:159; Moodie 2005:561-563). Importantly for what is to follow, the maximum average system did not apply, virtually from the outset to machine-drillers, to whom 'flexibility arrangements' applied (Levy 1982:153), and certainly not after 1914 (Moodie 2005:560-1).

In order to show all this, the following points, not all of which have received attention in this introduction thus far, briefly outline the direction of the argument and supporting evidence in this thesis.

The early industrial technology of the hand-held machine rock drill, resistant to change for over a century, represents (it will be argued) a peculiar form of formal subordination, is founded primarily on an absolute surplus value extraction regime and requires stable

and long working hours, with unperformed surplus value labour time, *a la* Wright's schema (1981:67ff), constituting a significant portion of the working day. Regarding unperformed surplus labour, as will be seen, it applies to both unavoidable time spent during the working day not actually working, unavoidable time spent working, as well as to systemic organisational dysfunctions in production, particularly 'downtime' delays preventing the performance of direct (actual) labour time. Workers spend time waiting after having clocked in at the crush and at the shaft stations, and hoisting and travelling to the rock face. Much of the time spent engaging in improvising - using tacit and experientially-based practical and organisational skills where dysfunctions and material shortages in particular arise at work - or what has been dubbed '*planisa',* is wastefully unproductive and avoidable (Phakathi 2001, 2011). In this regard there is much both ethnographic and quantitative evidence to cite in what follows.

The basic technology employed underground at the stoping rock face and the sets of social relations based on pre-industrial social class structures continued largely unbroken alongside the stability of working time arrangements. The design, capacity and nature of the core piece of equipment utilised underground - the hand-held, compressed-air-powered mechanical rock-drill - continues into the present to assume the centre of attention as social relations in and of production have undergone changes over the past twelve decades of mining in South Africa. This technology constrains the rate of surplus value extraction, with relative (machine-based) forms of surplus value extracted elsewhere in the value chain - and likewise constrains the civilised evolution of the social relations it drags in its wake.

The temporal components of the working day in which this technology is still employed, open up rather than close down the porosity of the working day as mining occurs further away from the shaft station on a daily basis. Work - the 'technical process of labour' - is and has consequently been considerably intensified - both in terms of massively improving technologies throughout the mining production process in general and by employing few worker more effectively - while long working hours remain a feature of the mining labour process. But is this continuing *generalised* form of extraction of absolute forms of surplus value strictly necessary? Workers appeal for transport for

personnel, more extensive use of mono-winches to transport material to the working face and the timeous provision of materials to the rock face to save energy and time for direct (actual) net surplus value producing 'face-time'. This in fact only occurs when the industry seeks to advance relative forms of relative surplus value extraction by mechanising the stope face (Dicks 1982) which have yet to properly succeed, let alone be generalised, in gold mining. The sustained intensity of the contemporary stress on labour productivity and consequent changing social relations in production is further fuelled by the lack of capital investment directly in production. The depressed value of labour-power, labour being a singularly significant portion of working costs, its relative 'cheapness' quite aside, has not and often still does not, it appears, warrant the investment. The underground working environment is often devoid of existing and currently available machinery which would make work easier. While the rock face in the stopes has proven stubbornly resistant to mechanisation, attempts to mechanise the rock face and thereby reduce the possibility of injury and fatalities by virtue of fewer workers being exposed to the most dangerous work places underground appear to have been episodic. The implications for employment were this to prove feasible, are not discussed here.

In this contemporary context, the full extent of the complexity of restructuring the workplace[12] and working times, in the interests of reducing labour time expenditure, becomes apparent as working time becomes contested anew. Examination of an attempt to resolve an instance where this issue surfaces raises matters of the reorganisation of production relations, worker autonomy in production and managerial disciplinary power. These matters begin to frame the possible options for the future of especially the platinum mining industry and relate directly to the employment of labour, mechanisation and

[12] The hierarchical structure of the underground workplace has usefully been outlined by Leger (1985:26) and more widely across a mine in greater detail by Moodie (1994:49). Apart from changes after re-unionisation in the early 1980's, eliminating the role of the indunas (ethnic representatives on surface in the compounds) and tribal representatives ('police boys') and introducing the role of shaft safety stewards and forms of team work in the late 1990's and early 2000's, the hierarchy remains recognisable.

continuous mining operations, signalling the continued importance of labour time and the need for practical theorisation.

The struggle and attempts to reduce labour time and change working time arrangements in key South African mining sectors - generally due to workers' demands - have been and remain an endeavour immured in complexity. The history of working time shows this clearly and will be demonstrated by surveying the historical record and further confirmed in detail by contemporary evidence.

High levels of contestation are encountered in mining in South Africa. Fraught racialised intra-working class divisions, however, have been softened by, *inter alia*, a formally shared working time regime and labour's united organisational stance when confronting working time arrangements in negotiations with management. In the current context, under conditions of globalisation, as the industry continues to find ways to lengthen the 'mine-week', while workers seek reduced but regular working hours, it finds itself facing a tentatively racially united labour movement, at least at the *de facto* organisational level.

Employing a contextually-grounded, experientially-based and historically-sensitive account, tracking working time since the inception of mining in South Africa, this study will conclude not with vague generalisations claiming applicability elsewhere. Rather, it will but note the implications of its analysis into the future of mining, particularly platinum mining, which stretches out across a region that promises to shape the local landscape and further afield with an impact reminiscent of the century past dominated by gold mining.

2 Learning, practical research and active engagement

> *Intellectuals who exchange ideas over the heads of those whose interest they claim to defend, without founding their work on the lived experience of those people, run the risk of irrelevance and elitism.*
> Michael Burawoy (1985:19)

2.1 Tracking methodological practice

The method for gathering data for this thesis was not a decision taken in the abstract prior to commencing research. The evidential base of the thesis was instead gleaned from a range of methodologies employed in a series of practical research projects undertaken in the mid-1980s and taken up again via academic and consultancy research projects conducted from 1999 to 2005. Some autobiographical comment is consequently unavoidable. I track the outlines of actual methodological practice and assert that the varied strategies adopted turned out to be a sound learning, practical research and active engagement *process*. The process began with findings initially based on small groups of lay-researchers reporting on their direct experience. This was subsequently supplemented with my own direct experience, with still small groups of more formally trained university-based undergraduate students conducting research both on surface and underground on gold mines. Further research was conducted with a graduate student, followed by a fully fledged triangulated research strategy including a large scale quantitative survey informed by past experience with qualitative methodologies. A direct intervention on a platinum mine shaft completed and rounded off this long research journey. Methodologically speaking, the experience of doing research developed and culminated in this work. This emergent process has, I suggest, resulted in the delivery of rigorous social scientific research findings.

Overall, the set of methodologies employed loosely squares with what Burawoy describes as the situation when the *same* researcher engages for more than 10 years in long-term

field research conducted via a series of focused 'punctuated revisits' to the same site (2003:669-670): research taking place, such as that of Robert Bates, via 'direct observations over a prolonged period', on the Zambian copper mines 40 years ago (Burawoy 1972b:241). My own 'prolonged period' of direct observation spans thirty years. My *site*, however, was broader, and my 'revisits' were interrupted and in the main, less focused: these 'revisits' being to the mining industry sectors of gold, coal and platinum (and the detritus of asbestos mining) in South Africa as a whole, criss-crossing various mines and collieries both underground and on surface.

Involvement with the Migrant Labour Project of the Agency for Industrial Mission (AIM) in 1981 first introduced me to the massive industrial labouring army of the mining industry. The Agency conducted a series of 'vacation seminars' for theological students from Lesotho and the then Transkei, who, after having taken the train with mineworkers returning to the mines, stayed in the hostel compounds and were required to keep a daily written record of their experiences of interacting with and interviewing mineworkers. Reports based on these records were submitted to an ecumenical group of churches concerned with their mission to industry, and to the Anglo American Corporation, who hosted the students. The very first of these reports, produced in 1976 and entitled 'Another Blanket', proved to be a controversial exposé of mining conditions of African workers. The briefing and de-briefing of students was the responsibility of a sociology professor, T Dunbar Moodie, for whom the 'vacation seminars' were to be an important initial source of research data (see AIM 1976; Moodie with Ndatshe 1994) and whose method of participant observation (Moodie 1976) was further developed and is described below. These seminars continued and I was later to be responsible for writing up reports (AIM 1984, 1986). The method employed throughout the migrant labour vacation seminars was explicitly understood as a form of 'action research' in which the student participants immersed themselves into the life-world of the mineworkers. This was referred to as 'taking the plunge'.

Thirteen years later, the research technique of 'taking the plunge' or what I later characterised as 'insertion' (into the field of inquiry) and 'immersion' (living in the

'field'), both germane to 'action research', was employed in the Sociology of Work Programme at the University of the Witwatersrand. At the request of the NUM, the department had become involved in a project called 'Deepmine', via another now sociology professor, Devan Pillay, then research officer of the NUM. The Deepmine ultra-deep mining research programme was a predominantly engineering feasibility project designed to assess the possibility of excavating gold-bearing ore bodies at depths of 5 000m (see Deepmine 1988-2002). It was a uniquely collaborative project involving tertiary institutions (the University of the Witwatersrand in particular) under the auspices of the Technology and Human Resources for Industry Programme (THRIP), the Council for Scientific Research (CSIR): Miningtek, the Chamber of Mines (CM), and participating mining houses; AngloGold, Gold Fields and Durban Roodepoort Deep, Limited. The universities largely provided the appropriate research personnel, while the institutions provided the bulk of the funding. The research method the small team of social science researchers were to employ was, at my behest, 'ethnographic', with researchers going to live in the 'time and space' of workers, as articulated in a then recent Wits University Sociology Department 'Occasional Paper' on how generalisations could 'extend' out from particular case studies explored ethnographically (see Burawoy 1997, 1998).

My own intellectual interests similarly lay in the epistemic adequacy of social scientific knowledge claims. It was not clear how my epistemological concerns were addressed by an ethnographic methodology that I was finally able to directly embrace, the grappling with which was to provide the methodological grounding for this thesis. I take it for granted that theoretical orientations and methodological choice are inextricably intertwined; or, as Burawoy puts it, in line with a long tradition, that 'facts' are heavily value-laden (1997).

This chapter tracks the research methodologies subsequently employed throughout my long-standing interest in mineworkers and mining. In doing so I follow the cue of a standard text in social research methods where examples and illustrations are noted throughout the text (Neuman 2000). This enables the dialectic movement between the development of theory and the growing accuracy of actual research findings to come to

the fore. This is important as the methodological basis for this thesis, as noted above, was not constructed *a priori*, but was rather a process of learning born of practical research and actual engagement with the industry via interaction with workers and key organised labour, managerial and institutional role-players.

2.2 Participant observation and ontological commitments

This thesis consequently originally began, *hubris* and naïveté notwithstanding, to tackle the dilemma of what constitutes 'knowledge' by reflecting on a series of stints of ethnographic participant observation on mines and occasional 'revisits' to the same site into what was then the deepest mining excavation in the world - 4 717 metres below surface. The mine was one of the three old Western Deep Levels shafts, one of which was renamed Tautona during the time a group of researchers were on the mine, with snake-like queues of workers, strongly reminiscent of South Africa's first democratic elections in 1994, very patiently waiting their turn to collect a very modestly sized *braai* [13] pack in celebration of the event. Immersed in this context, I attempted to explore the epistemological implications of doing ethnography while living in the single-sex labourers' compound and observing work in the diggings underground.

The methodological concern was to construe (as a first learning experience) common sense observations as, in some measure, epistemically adequate to social scientific inquiry. Given that the analyst was 'immersed' in the specific context of research, life in the hostel compounds and at work underground, this fact appeared to strengthen the epistemic status of whatever knowledge claims might derive from an ethnographic method predicated on the testimony of the researcher. Direct personal experience is, after all, a key moment in the origin of knowledge, especially of the social world (Polanyi 1958).

[13] Meat to grill.

It did not take long to realise that the immersion of the social analyst into the field of social scientific inquiry is fraught with danger.[14] One central dogma of much social scientific methodology - value freedom - is the first potential casualty. Ideology is the inevitable result.[15] The dogma of much natural and social science, objectivity itself, follows suit.[16] Bad science results. The dogma of positivism - rigid subject/object distinctions - falls with its epistemic comrades. The possibility of knowledge appears to recede.[17] Worse still, perhaps, the loss of self is potentially threatened.[18] Crossing over,

[14] Michael Burawoy outlines these dangers as loss of objectivity, contamination of the subject and falling foul of the 'uncertainty principle' of sociology, viz. the closer one gets to one's subject, the further you move away from objectivity and the capacity for the formulation of valid generalisations (1991:2).

[15] Needless to say, the relation between ideology and objectivity is complex. On the one hand, we want to uphold objectivity, while on the other, in subjecting it to critique as socially constructed and in some sense epistemically relative, hence arguably potentially ideological, we seem not to be able to come up with an alternative account that does not in some or other way rest on what we generally understand by objectivity in the first place. See Railton (1984).

[16] I follow Peter Railton's straightforward construal of objectivity, with special reference to scientific objectivity, as constituting value freedom, the lack of bias and the use of procedures that are reproducible, are inter-subjective, independent of particular individuals or circumstances and employ effective criteria (Railton 1984). Yet I also want to accept Polanyi's assertion that: 'The claims of bourgeois science to objectivity and universal validity are unmasked as false pretences on the grounds that no affirmation of science, history, or philosophy can be objective and that in reality they are always partisan weapons' (Polanyi 1958:239). Pierre Bourdieu cuts to the quick of the argument that follows: 'Are disinterested behaviours possible, and, if so, how and under what conditions? If one stays within a philosophy of consciousness, it is obvious that one can only respond to the question negatively and that all apparently disinterested actions conceal intentions to maximise a certain kind of profit' (Bourdieu 1998:86). The nature of my partisanship, interest and resulting ambiguity will doubtless become evident in what follows. This is, however, not to say that sharp analytical distinctions cannot be drawn.

[17] In some important sense scientific knowledge, underpinned by a positivist methodology, remains the paradigm and touch-stone of all valid knowledge (see Giddens 1972:1). Habermas also says somewhere (in an elusive reference) that the self-understanding of the social sciences turns around positivism.

[18] Marianne Torgovnick (1997:3) begins her fascinating account with a quote from Malinowksi's private research diary revealing his fear of '…letting myself dissolve in the landscape' (Malinowski 1967:73) and 'merging' with the 'object' of his social scientific inquiry. He muses:

merging, into the 'field' is risky business, as Burawoy has been seen to implicitly aver. The social scientific motivation for adopting ethnography is, of course, to access data from human subjects that is otherwise inaccessible. The underlying assumption, often stated and explicitly chosen, is that *Homo Sapiens* is sacrosanct. Unable to factor human indeterminacy under its ambit, social science consequently continues to struggle to gain a sufficiently strong epistemic foothold in the world. So much the worse, then, it seems for robust social scientific knowledge-claims.

Are social scientists, I consequently wondered, to concern themselves with such seemingly intractable meta-theoretical issues, running the risk of never getting on to social questions, or simply make as informed a choice as possible between incommensurable conceptual schemes and theoretical frameworks and simply get on with it?[19] Such is the contemporary epistemic dilemma.[20]

2.3 Learning to do ethnographic research

With hoary meta-theoretical concerns naturally unresolved, I rediscovered my admiration for John Berger and Jean Mohr's (1975) seamless elision of photographic art and social science in their *A Seventh Man* from nearly twenty years before (see Stewart 1981).

'I sat on a bench for a while: stars; I thought about objective reality: the stars, the sea, the enormous emptiness of the universe in which man is lost*; the moment when you merge with objective reality*, when the drama of the universe ceases to be a *stage* and becomes a *performance* - these are the moments of true nirvana' (see Malinowski 1967:120) (My emphasis). In the tradition that follows, Goffman picks up on the notion of *performanc*e (1959). Worse, my emerging from underground in sawn-off jeans and a tee-shirt with the workers shift was thought by one manager to be a 'spectacle'.

[19] Turner (1991:8) poses the question and opts for making the best possible choice and not getting bogged down in the meta-theoretical philosophical issues. I continue to argue for *simultaneously* getting as close as possible to the supposed object of knowledge, while being mindful of meta-theoretical concerns.

[20] The dilemma, reducing (for me at the time) to a choice demanded between absolutism and relativism, is of course ancient and widespread, and found in ancient China, India and Greece (Scharfstein 1989:89).

Berger and Mohr's practical steps to realising hauntingly vivid and imaginative social analysis flow from their incomparably agent-sensitive, class-based perspective. The apparent simplicity of their presentation belies the underlying theoretical sophistication that informs their work. The multi-disciplinary nature and visually arresting character of their account of migrant labour inspires the practice of a transformative social science both *intimately personal and intensely political.*[21]

Excavating subjective meaning structures, born of 'thick descriptions' *a la* Geertz (1975),[22] is the stuff of an ethnographic orientation. Berger suggests the experience of another can be unearthed by 'dismantling the world as seen from one's own perspective' within it, and 're-assembling it, however clumsily, with the subject as central' (Berger and Mohr 1975:93). By contextualising subjectivity within its social context, he argues, the 'normal' is revealed as both 'falsely normative' and 'oppressive', thereby contributing, by analysis and assimilation thereof, to the possible return of true subjectivity and the potential unleashing of liberatory human action (Berger and Mohr 1975:104).

The opportunity to put Berger and Mohr's method into practice again[23] was afforded by involvement in the Deepmine project. The initial brief was to ascertain the responses of men to going down underground to work at 5 000m, as well as their responses to the environmental factors of increases in seismic activity (unpredictable rock bursts and falls of ground), depth and heat (above 30 degrees wet-bulb temperature at 3 000m), pollutants (dust in particular) and the impact of even longer-than-normal transport times from surface down underground and back.[24] Researchers each took on one of these issues. I

[21] This is simply a practical construal of what Peter Railton identifies as the central theme of Marx's *Theses on Feuerbach*: the concern 'with suggesting how an epistemic link between objective reality and subjective experience can be forged through active human intervention in the world' (Railton 1984).

[22] See Appendices I and II below for my attempts at 'thick description'.

[23] See Stewart (1981) for work putting this orientation into practice.

[24] This was largely my construal of how best to produce the research deliverables. My field diary notes: '*Eddie* [Webster, the Task Director] *relieved the intellectual pressure by reminding the final*

was to take on the issue of transport which generally absorbs a considerable amount of labour time during every worker's underground shift.

I was assigned a work place underground that was only accessible by a narrow stairway alongside a large pipe rack, with 1 029 metal steps between two mining levels. After the shift had taken it out of you, the steps, metaphorically speaking, 'killed you', as everyone rushed to catch the man-carriage to the shaft station by 12.15pm having gone down underground at around 5am. Missing the carriage meant a walk of around 3km to the station before inevitably queuing for the two hoists to the surface. There had once been a man-lift down the pipe-rack to obviate the need to traipse up and down the steps, but this was discontinued, I was told, after an accident resulted in 40 fatalities.

Briefly, five researchers spent between three and six weeks living in the hostel compounds and working and observing underground, initially at AngloGold's Elandsrand Mine implementing a 'pilot phase' and then at Tautona gold mine. After going through the rigours of heat tolerance testing (a rationalised form of 'acclimatisation' - see Moodie 1976), I later conducted two more stints of research, one 'revisit' lasting three months (see Phakathi 2001). These immersions into the social site of research followed a series of focus groups conducted by colleagues at SWOP and classroom briefings with introductions to relevant literature. After a weekend in the Motebong hostel[25] and a morning in the Training Centre at Tautona Gold Mine, researchers went down with the shifts to working areas, each of which had been selected as typifying the extremes of the different environmental factors noted above. The series of debriefing procedures largely

meeting before we left that the project never promised any quantified results - indeed if that even be possible, though I think we should try to proceed in order to have as sharp a focus as possible' (Field Notes, 3.45pm, 17 April 1999) (my emphasis). I only somewhat belatedly learned the importance of staying within the 'scope' - contractually specified - of a formal, institutionally-funded research project, and continue to struggle to do so. By such means is social control exercised over social science.

[25] There were 4 500 men in the Motebong hostel, which had previously, I was told, housed around 9 000 mine workers in more cramped times.

mirrored those conducted years before with the students from the theological colleges. With Professor Dunbar Moodie again in harness, the first report of findings was submitted to and accepted by Deepmine (Webster, Moodie, Stewart & Psoulis 1999).

2.4 Acclimatising to compound life and work underground

One of the first learning experiences in employing an ethnographic method was how a series of inversions appeared to abound in the particularly powerful spirit of place that constitutes the world of South African gold mining. The researchers sought to observe, to interview, to understand. On entry into the 'field' of compound and mine, researchers were instead observed, interviewed and sought to be understood. In my case there was a further inversion. In academic halls I was, for a while, a mentor to fellow researcher, Simon Ramapepe. On the mine I was, initially, his mentee.

In this context, the researcher became the observed. In the acclimatisation chamber, waiting in the medical queues, eating in the kitchen, sleeping in the rooms, washing (in my case) the only pale skin in the showers, wearing workers' blue overalls, seen emerging from the shaft with slime-encrusted boots, drinking at the liquor outlet and finding their way around, prompted the question what the researchers were doing there. Burawoy similarly notes different kinds of reception based on culture and language received in very different research contexts (2009). The difference in race in South Africa, which framed my context, remains acute. Introductions and explanations at National Union of Mineworkers' (NUM) meetings only reached around 300 of the more than 4 000 men on the mine. Official memoranda sent down the company's communication chain did not reach all supervisors, let alone all workers.

Acclimatising to life on a mine and learning about this environment lay in functioning as a catalytic receptacle of snippets of information and testing their veracity - insofar as they articulated or challenged one's own experience shared with and expressed in the world-view of workers - in subsequent interactions. Asserting the illogic of specific managerial

procedures and of untold inefficiencies observed underground, for instance, evoked instantaneous recognition and instant rapport. Talk of low labour productivity, austerity measures and fiscal cutbacks on materials required for production was met with hardening glances and stony silence. This latter kind of talk created immediate social distance and the abrupt halt of communication.

It did not, consequently, take long to work out that this was an 'us' and 'them' world. This is hardly surprising given Burawoy's involvement in the second of the Deepmine projects and his emphatic statement about the relation between researchers and informants and that 'Hermeneutic science sets out from a dialogue between us and them…' (1997:5). A further dichotomy, however, asserted itself in this field of research, for this was not the chasm between researcher and the researched, but rather the chasm between workers and 'the mine' - as workers referred collectively to authority in general: supervisors, managers and the mining company itself. Academic niceties of dispassionate objective distance dissolved as our job was clearly understood by workers to 'tell it like it is', to 'tell the truth', to let 'them' know what really happens and what is actually going on. For, as workers expressed it, 'they' ('the mine') remain ignorant, ignorant of 'our' pleas, and proceed only with 'their' plans. There was, workers seemed to assert, their own 'truth' and 'knowledge' as opposed to the 'lies and ignorance' of 'the mine'. Unsurprisingly in the South African context, this assumed a racial character. The claim 'the white man knows nothing' rapidly came to constitute a well-worn litany. Needless to say, such a locution requires interrogation and contextualising. As a general statement it was simply not empirically true: what is important is how widely it was experienced and reported by researchers. The task of ethnography was to uncover what men meant by it, for it is such beliefs that shape both individual and collective behaviour.[27] And it is behaviour at work (or more dynamically, activity or *praxis*) that impacts on safety, productivity and, ultimately, surplus value and profits (see Fromm 1971:68-84).

[27] The use of the term 'behaviour' does not imply 'a mechanistic, behaviourist psychology', but rather the 'man's *relatedness* to the world', 'relatedness to himself, to others and to nature…' (see Fromm 1971:71- 73) (his emphasis).

Researchers, consequently, proceeded on the basis of a growing awareness and grasp of the subjective meaning, understanding and acceptance of how the world works as experienced by men who, as Moodie (1994) had pointed out, somehow managed to carve out and sustain, under trying circumstances, a significant degree of moral integrity.

As a rank outsider in unfamiliar territory, this (white) researcher was consequently met with the full panoply of human responses: complete incredulity, blank astonishment, open curiosity, utter amazement, leering suspicion, quiet hostility, threatening gestures (fortunately reported, not seen), dark mutters, silent glances, but with an over-riding warm and friendly expansiveness of heart. The researcher was initially continually confronted with the question: 'What are you doing here?' Talk of a combined University, CSIR, Mining industry and NUM study was a start, but made little progress. Talk of whether it was feasible to dig to 5 000m was only a little better. The men said they could do it as long as they were (well) paid! Strongly quiet and generally non-verbal assertions of positive confidence met the question. It is as if informants wanted to say: 'Who do you think we are?' The unstated implication was that informants' self-understanding was they were the *madoda*[28] of the mine. The relaying of careful observations and descriptions of actual events and a quickly growing set of experiences, however, unfailingly supplied workers with a satisfactory answer. My standard response, as a researcher under interrogation, often in the liquor outlet, would go as follows:

> I was in Section 232 at 104-East down from 100 level. I sat in the stope for five hours from the time when the stope was fresh from the night shifts' scrapers, until there were 120 holes (60 per two-man drilling team) drilled on the red grid. I climbed out wet and exhausted with the last driller dragging his orange hoses. I observe and keep notes. One of my observations is that the shift boss comes in for five minutes, often only to point (at problems) and to shout (at workers). This will become one of the observations which help to understand the process of mining. I will record that the men say 'the white man knows nothing'. And I want to present

[28] 'The (mature) men' (of the mine) - replete with manifold connotations of patriarchy, machismo, virility, discipline and strength - in short, what Dunbar Moodie (1994) refers to as 'moral integrity'.

> this as the true experience of what the *madoda* say. So briefly that is I am doing here.' Eyes would shine: 'Yes! Yes! What are you drinking Baba[29]?'

The actual field diary entry reads as follows:

10.05am, Sunday 25 April 1999

> That the shift boss who does nothing, but bark and shout and look for someone to 'charge' and knows nothing, is common currency. When workers ask me what I am doing I say I am simply to describe as honestly and truthfully what is happening underground and to let the facts speak for themselves. Total agreement, again, achieved every time, without a single exception.

More than one research project would go by before I accompanied shift and mine overseers underground to gain a very different perspective. Yet at the time, by such means, the researcher accomplished a tenuous link of rapport with a few individual mineworkers. The researchers' story had to be told dozens of times in different ways, in the rooms, underground, in the evenings drinking most especially. Regarding alcohol consumption, Burawoy notes that the scholarly tradition had long recognised that it is 'well known' that miners are, 'throughout the world', 'heavy drinkers', particularly after pay day, but that this is no reason to attribute low productivity to the fact (1972b: 253).

Underground I sensed nods in my direction: that's the *umlungu*[30] seen at the kitchen. Similarly, while eating in the kitchen at 4.30 in the morning's dark I would be identified as the *umlungu* from 100 level. Over time researchers were consequently seen more regularly having earned some tentative right to be there and tacitly accepted. They thereby permitted themselves a more relaxed confidence to continue with the job at hand; to learn, faithfully record and to understand. The evidence of the now softer overall that had shed its creases and shine and slightly scuffed boot-soles appeared to bear out the sense of gradual integration. The once heavy head-lamp started leaving the feeling of nakedness

[29] This literally means 'father', but is more widely used as a term of respect.

[30] White man

now if absent. Travelling ways underground began to display familiar features. The danger zones in the long gully at 100 Level at 3 000m had quickly become part of this researcher's mental map. The advance of the rock face in the stopes started to make sense. The confidence of creating an extra inch of physical space in 'the crush' was noted as more aggressive.[31] The rhythms and patterns of the underground shift gradually took shape. The researcher incrementally appropriates territory on the way to, in some sense, becoming a miner.

Such, briefly, is the researcher's learning process requiring systematic theoretical problematisation. Researchers learn to 'see'. Preconceptions die fast. Vaguely formulated research hypotheses dissolve in the pool of the light of the head lamp against hard rock. The seeds of new ones remain inchoate, muddled. The question what one is doing there asserts itself. Needless to say, the learning process for me and five other researchers located in the uniquely vast and complex artificial environment of the underground diggings was initially experienced as a welter of observations, perceptions, emotions and scattered insights in the structured chaos of the beer-hall above on surface and in the subterranean hive of the workings below. Physically, surface and underground, and temporally, on-shift and off-shift, most obviously mark off this territory, this world: this place that explosively advances in myriads of directions, followed by the silence of settling dust, time and again, yet inexorably, ever laterally outwards and downward following the decline of the reef.

A degree of normality and familiarity settled in over the next five years after a modest 100-odd shifts spent underground in continuing with this research strategy across three gold mines and two collieries in a further study for Deepmine (Webster *et al* 2001) and subsequent CSIR co-ordinated research projects, dubbed FutureMine (Webster *et al* 2001; Ashworth *et al* 2003) and Coaltech 2020 (Ashworth *et al* 2003b; Smith *et al* 2004). Clean and neat research hypotheses and research questions, I learned, became dispassionately applied more easily.

[31] This experience was later to be confirmed by an intrepid female researcher (see Benya 2010).

The point is that having been finally totally immersed in the research context of my choosing and the actual experience of having directly employed ethnographic participant observation research methodologies as an entry point, I consequently make the bold claim by echoing the miners' common place epistemic declamation: 'He who feels, knows'. While this stance is clearly not sufficient for making robust agent-orientated social scientific knowledge claims, it is, as a bare minimum, necessary for making such knowledge claims. For as Strauss and Glaser put it:

> The field worker knows that he knows, not only because he's been there in the field and because of his careful verifications of hypotheses, but because 'in his bones' he feels the worth of his final analysis (1965:8, cited in Jick 1979:608).

Later, underground visits to platinum mines were all day trips with no overnight stays in the single sex quarters. The 'careful verifications' of hypotheses were to take the form of quantitatively testing some long-held conclusions about the labour process, its seemingly disorganised and chaotic character, caused principally, it seemed at the time and which was later quantified, by the lack of materials at the rock face. It was workers' experience, in research striving to be agent-sensitive, which continued, however, to assume centre stage.

2.5 The lived experience of labour time

> *The guys asked me about you. They wanted to know what a white man was like. I tried to explain to them that he is a man the same as us. I said 'You can see. The umlungu eats in the compound. He sleeps in the rooms. He washes in the change house. He works underground with us. He is not different from us'.*
>
> Benjamin (a mineworker explaining the presence of a white man living in the migrant workers' compound)

Very little social science elicits heart-felt empathy for the human 'objects' of its investigations.[33] The ghost of a philosophically discredited positivism continues to cast a

[33] One remarkable exception, which has not in my view become dated, is Rubin (1974).

long and eerily persistent shadow over its nevertheless ostensibly objectivised abstract social scientific formulations and practice. The reality of positivist practice, in both the natural sciences and even those social sciences that embrace it, virtually explicitly prohibits the introduction of any semblance of emotionally tinged intellectual labour into scientific and rational discourses. There is no sustained account, in any social scientific literature, for instance, of the South African mining labour process that breeds the 'feeling for the labour' of workers, the application of their labour power underground and how time is spent there. This is partly due to the importance for social science of abstraction and generalisation under the hegemony of academic analysis. That social science must uncover the underlying sources, which an 'unexamined life' is precluded from identifying, is not in doubt. That it assumes formulations couched in theoretical abstractions, which must be overcome, remains its singular challenge, at least as far as *social* science is concerned, if it is (as I maintain) to be of general liberatory import.

Testing these views and stance assumed gaining access to the mining labour process, which has indeed been a most hidden abode of production, precluding observation by outsiders. Any view of how workers confront the geological and engineering mining environment, powerfully framing the performance and experience of work underground, has genuinely been closed off from the academic gaze and public sight. You don't just jump down a mine if you do not have a job of work to do there. It is important to rectify this malady with more detailed accounts of the experience of time spent underground, not least because the organisation of mining work itself is created and reproduced within the context of the uncertainty and unpredictability of the underground geological environment (Burawoy 1979:206). A lived, experiential, 'situational' description and analysis is required to appreciate something of its rigours: we must 'do' things with those who we study, says Burawoy (1997:15), recalling Harold Garfinkel's (1967) injunction.

In order to provide something of the flavour of work underground, two Appendices attached to this thesis provide three descriptive accounts: an experientially grounded

imaginative account and two interpretive recordings of actual instances of work underground, all constructed from first-hand experience.[34]

Appendix I tracks a typical, experientially based working day in the life of a mineworker, thereby illustrating, *inter alia,* something of the sense of what it is like to work underground.

Appendix II provides two descriptive accounts that delve deeper into the actual experience of mining work. Both focus specifically on what Wright terms 'unavailable surplus labour' time (1981:68). Much of this is 'wasted' labour time from workers' point of view. The unproductive spending of time illustrates how significant quantities of labour time are expended in the mining labour process struggling directly with the geological environment, prior to engaging in 'net surplus value' producing labour time that attracts workers' bonus payments and is the crucial temporal component and source of economic profit (see Wright 1981:68 and Chapter six). This appendix also reveals the 'porosity' of the working day in mining and the often flawed social organisation of production which results in valuable time being misspent underground - to the detriment of both capital and labour, thereby unnecessarily increasing socially necessary labour time (see Bonefeld 2010:269).

2.6 Rethinking epistemological concerns

The theoretical perspective to be outlined in the next chapter analyses the concept of labour time - the time workers spend in production from clocking in at surface before going down the mine and when they clock out again after their shift underground. The two following chapters track the labour time of workers over a century. Seeing that labour time is time alienated from and consumes workers' leisure, disposable or 'free' time, a methodological question arises of how to access the collective experience generally of

[34] Dr (now Professor) Ray Durrheim, a mining engineer and Programme Manager of the Deepmine project, deemed an earlier version of these actual accounts to have been 'typical' of mining. Personal communication.

those labouring under and within their imposed temporal production regimes. What, in other words, is the substantive content of labour time expenditure? How is work itself contested - especially when workers' knowledge is central to their struggle to reduce working time?

As noted, what soon struck me was that this 'us' and 'them' social environment was similarly elsewhere characterised by sharp binary distinctions. What researchers observed, on the basis of workers' experience and initial observations *in situ*, was also not surprising: the relation between black workers and white managers in production was primarily despotic.[35] The evident gaps between 'black' and 'white' in the South African context, who works and who does not, the 'right' and 'wrong' way to do some or other job and what was safe and what was not, prompted a revisiting of the sharp positivist distinction between subject and object. The certainty with which men expressed themselves regarding these issues challenged the view born of qualitative research methodologies and a post-modern intellectual milieu that everything is subject to interpretation and differing perspectives. The 'object' of our social scientific analysis was, on the face of it, simple, and hence a seemingly paradigmatic exemplar for social scientific analysis. We were there to study mineworkers at work under mining conditions. It was, and arguably is, both the character of this 'object' (the interaction of human agents with nature and other men) and the motivation for the activity (the sustenance of life itself) that enables this 'object' to qualify as paradigmatic. In the working stopes underground, characterised by a rock drill operator and his assistant, the drill and the rock face, the 'object' of social scientific inquiry appears to be fairly simple.

With regard to the study of work, work organisation and the interactions between human agents and nature, where work is defined as purposive productive activity, there are (if the clear-cut views of the world of the mineworkers are taken seriously,) self-evident facts of the matter: a spade is a spade. Underground there might be a dispute as to the best way to

[35] Durrheim (personal communication) pointed out that the claim would disturb senior management seeking to change traditional work relations in the industry under new constitutional arrangements.

do the job, or even whether a particular aspect of it needs to be done, but a basic assumption that we are at least talking about the same thing must be made: rock must be broken and moved. Our method of immersion in the situation where rock is broken and moved seemed to constitute a straightforward common-sense methodology that, *as a start*, permits the on-site analyst to assimilate the shared assumptions of mining men (and a little over a decade ago they were all men). To enable this assimilation, total 'immersion' was indeed necessary.

This qualitative methodological research strategy was to continue for a decade and was strenuously defended as necessary to inform later large-scale quantitative research projects and the use of randomly sampled survey instruments. I nevertheless remained concerned about the problem of making adequate social scientific generalisations.

I suggested a decade ago that, for Michael Burawoy (1997, 1998), as a result of having eschewed (or being eschewed by) positivist criteria for knowledge, the ethnographic epistemological baby appeared to have been thrown out with the positivist bath-water (Stewart 2000). For the sharp distinction, as assumed by a positivist methodology, between subject and object appears to have been rejected and I wanted to argue that aspects of such sharp distinctions need to be maintained. The world, however, is not always how our informants say it is or even how we perceive it on the basis of our ethnographic research experience. In fact, the testimonial evidence of informants can be downright contradictory. One thing, however, seemed clear enough. The relation between human agents and the natural world in a mine is, quite literally, a hard one. Men are not rocks and *vice versa*.

The physical environment underground seemed to lend itself to strong epistemic statements. South African mines constitute the deepest mines in the world, with miners and mineworkers working some of the hardest rock in the smallest of physical working spaces conceivable. Miners are literally encased in rock, often in the dark, below three kilometres underground. This research field is ideal for close, unencumbered observation

and the formulation of sharp distinctions corresponding to the practices of 'lived working experience'.

Ethnographic methodologies are predicated on testimonial and qualitatively based evidence: observation, lived experience and researcher-conducted interviews. Yet the theory-laden perspectives of even simple observations influence both what is seen and how something is perceived. For, whatever social scientific object is under review, workers and management prevaricate over working safely at the rock face. With the passing of labour time, rock proves to be either solid or soft, safe or dangerous, a foundation or a hazard; and this learning experience changes perceptions, views and actions. Experiential knowledge born out of labour and time is required to establish more adequately precisely what constitutes safe behaviour at work. Where the accurate assessment of more complex issues is at stake, the evidence of persons manifesting the combination of having expended labour and time at work is required to establish whether a side wall underground is safe or not. Rock is not just rock. On a soft side-wall under seismic pressure, especially at the leading edge of a stoping operation, it is literally crushed into the consistency of talcum powder if not regularly barred (chipped and levered) down. The matter does not of course end there. Old-timers become blasé, taking risks is endemic, and accidents are thereby caused and do not merely 'happen'.[36] This ultimately decides the facts.

If the 'small', but vital matter of the state of the rock can be subject to endless argument: 'It's only soft on the surface.' 'Yes, but there are cracks you can't see.' 'Don't worry! It's much worse in section 100.' 'We should bar it down now!' 'No! we will do it over the weekend', it is no wonder that social science is generally epistemologically deficient, Burawoy going as far as to claim that sociologists are 'epistemological cripples' (1997:1) or that at least we need a crutch to prevent us from being 'thrown off our balance by our

[36] There is a vast literature on the topic of accident causation. See Nichols (1997) for an excellent overview of this and related issues.

presence in the world we study, by absorption in the society we observe, by dwelling alongside those we make "other" ' (1998:4).

The abstractness of ideas, *qua* ideas, is in general in stark contrast to the flux of actual life. Even prescient analyses of production seem to me too far removed from that which they otherwise admirably explain. For instance, regarding my own collaborative work, what happens in the context of underground work, the findings of the Deepmine project revealed, is a far cry from what is thought to happen there from a managerial point of view (Webster *et al* 1999). Yet this research only scratched the surface of the complexity of the underground environment and the interactions of those who work there. The dichotomies between conceptions and practices continued to press the case for maximum epistemic rigour. My attention was consequently drawn to the violations of a standard positivist methodology Burawoy makes no pretence to avoid (Burawoy 1997:10). Given the contemporary status of the epistemic power of quantifiably rooted perspectives, this worried me. Even if valid and generalisable conclusions could be made by extending out from the cases under review, was this sufficient for *science*? Did such generalisations not require a stronger, quantified basis to ensure epistemic adequacy, the singular limits of a positivist methodology notwithstanding?

Michael Burawoy, meanwhile, had long been busy counterposing hermeneutic science to positivism, contrasting the research methods of the 'extended case method' and survey research, and elaborating the technique of interviewing and participant observation (1998). That quantitative survey research and qualitative fieldwork are often taken to be two distinct *kinds* of methods is common practice (Jick 1979: 604). For Burawoy, the extended case-study method, as a research method, stands in relation to hermeneutic science as survey research stands in relation to positivist methods of social scientific practice. Instead, however, of positing 'two sciences', as does Burawoy, albeit not without some reluctance, my initial preference over a decade ago was and remains the development of a stronger evidential basis, and, indeed, a more 'positivist' reading of social science and even sociological Marxism for that matter.[37] Counter-intuitively for an

[37] Burawoy does make it clear that it is not so much that he rejects positivism, but that 'positivism

ethnographic orientation, certain strictly positivist criteria for knowledge, I began to think (Stewart 1999), were more readily met than Burawoy, following Jack Katz's (1983) construal of those criteria, appeared to believe.

The four key criteria Katz outlines are the problem of reactivity (affecting, influencing or 'distorting' the world from which data are drawn), the principle of reliability (the selection of criteria for gathering data), the principle of replicability (obtaining the same results from different studies at different times by different researchers) and the principle of representativity (how population, sample and sample size stands in relation to the whole) (see Burawoy 1997:9-10).

Whereas Burawoy shows how he 'violates' these principles, I was keen to see how far they could be satisfied. Whereas Burawoy sought to deal with the epistemologically debilitating 'ethnographic condition' by 'turning it to our advantage', I was keen to press on and test and quantify the best generalisations afforded by 'extending out' from the particular (Burawoy 1997:1).

2.7 Adopting a 'panoptic' perspective and research technique

I propose a way of strengthening the knowledge claims of an ethnography that seeks to make valid generalisations, or 'generalisations of a particular kind' of which 'there is an established line of argument' (Edwards & Belanger 2008:291), applicable beyond the case studies within which the ethnographer is located. Departing from the 'established line of argument' I add a further methodological technique, as well as following up with quantitative studies (see Chapters eight and nine). I adopt what I have termed a 'panoptic' perspective and technique of analysing work and its organisation underground. There are two elements to the 'panopticism': perspective and the technique.

Perspective relates to the researcher's capacity to marshall a very broad array of data, informational and empirical, as well as conceptual and theoretical. All researchers,

rejects the extended case method' (1997:9).

whether in the natural or social scientific traditions and whether Marxist or not, begin their empirical studies with a particular perspective, partly inherited and partly achieved.

The *technique*, initially born out of the uniqueness of the darkness of underground mining (hence partly by default) simply involves observing without being noticed. It permits various degrees of unobtrusive observation of the doings and goings-on within the site of research. Where the completely surreptitious immersion of the researcher is possible, the strictest application of *one* of positivism's criteria for objective knowledge is satisfied - that is the problem of reactivity, the danger of influencing that which falls under the academic, social scientific gaze.

By way of illustrating the panoptic technique, the daily working 'office' of mine workers at the heart of the labour process - men and the very few women only recently found in a backfill stope - measures an ideal 800mm x 1 400mm x 40m, running at an angle of anything between 15 and 30 degrees, in depths of up to 3 500m underground, engaging directly with the forces of nature with hand-held machine power tools. It is dark, illuminated only by the cap lamps of those who work there. In mid-shift this area has four such lamps focused on the drill and the rock face, sometimes only two. If there is such a thing as a social scientific human laboratory, this is it. This research field is ideal for close unencumbered and unobtrusive observation. The preliminary examination of any number of research contexts can begin by using such a technique of observation and need not necessarily be dark. Anonymity will often do - street corners, café society, transport hubs and the like.

Underground, by (illegally) extinguishing your cap lamp, an infinite series of surreptitious, covert observations can be made. The positivist injunction against reactivity, namely the ways in which social analysts distort or otherwise affect the 'worlds they study' (Burawoy 1997: 12) can be satisfied. The 'panoptic' clarity afforded by the dark has, on occasions, the capacity of precluding the observer from directly distorting the object of observation. How long it takes to drill a hole, how many holes are drilled, the time wasted waiting for the disrupted power to come back on, how the machine operator

and his assistant interact and how long precisely this all takes, can be accurately and reliably recorded. Workplace ethnography is, after all, primarily a study of 'how work gets done' and not of the 'purely social relationships that may happen to occur in the workplace' (Edwards & Belanger 2008:192). Follow-up interviewing can take place or the information can profitably be used to design a variety of both qualitative and quantitative research instruments. By accessing the top of the stope, where it was poorly ventilated and the temperature was over the limit of 32 degrees Celsius (wet bulb), I came and went undetected throughout an entire shift doing just that. I observed a worker acting similarly to avoid censure by using the cover of dark.

More broadly than this simple example, the problem of *reactivity* under conditions of ultra-deep mining, I suggest, can be overcome. The two situations recorded in Appendix II were hazardous ones, with conditions facilitating the elimination any reaction men might have had to a researcher being present. In both situations, in which the analyst was simply another individual, every mineworker and miner was intently focused on the problem at hand. In the fraught situation described as the 'cavern', any disquiet the shift-boss Jan may have experienced that I may have witnessed any infringement of mine regulations was seemingly of little consequence at that point. He did later want to know what I was doing there and what my 'status was on the mine' and had initially been concerned about what I had seen, but in the panic of the important moment of him having to act, I must surely have been quite forgotten as an element in his decision-making. To cite a further example, where men reacted in a hoist which went into a 'yo-yo'[38], an overall-clad researcher in the swirling dark of the hoist among 120 other tightly-squeezed mineworkers and miners - to whom he is completely unknown - makes for unencumbered, non-reactive observation. Where my white skin made me stand out against the labouring men, a colleague was less lucky and was assaulted for not doing something correctly, having been mistaken for an ordinary worker. Perfect anonymity and non-reactive observations are achievable, the risks of 'complete immersion' aside.

[38] The cage of the hoist literally bounces up and down at the end of its cable, which can run to a kilometer in length.

To confirm the reliability of a certain range of observations regarding the productivity of a machine operator in a dark stope - thereby assuring another positivist principle, that of *reliability* - and ensure the validity of findings, while not done in this instance, would have been a simple matter of counting. Checking for face advance (which turned out to be the crucial issue as related in Chapter nine), the depth of shot holes could, in addition, be readily measured.

Regarding the criteria to satisfy a third principle, *replicability*, the issue, in this instance, would not be to repeat the exercise and expect to record the *same* findings, but rather different ones, but which result in similar conclusions. The exercise is eminently replicable. Replicating a reliable research methodology - or in other words subjecting a theory to an empirical test - is not to be confused with conducting a laboratory experiment where all elements are held constant to achieve the same result. What is intended here is more akin to taking successive temperature readings with a reliable instrument where the methodology is replicated and different results are anticipated. Replicability of the *same* experiment is not to be confused with obtaining *different* empirically testable findings. While 'some sort of empirical test is the primary criterion of the evaluation of social theories', as Fred Moseley writes (1997:11), this is not to hold that incontrovertible proof is possible in the social sciences.

Further, unlike Burawoy's concern to make generalisations from single case studies (1997; 1998), the past decade covered gold, platinum and coal mines across two major mining groups investigating a range of issues and topics, all of which could be replicated under similar conditions, but wherein, due to these being social scientific and not natural scientific studies, *different* findings are anticipated. While history is certainly not a 'laboratory experiment', as Burawoy rightly points out, 'which can be replicated again and again under the same conditions', mining stopes underground and the nature of the work performed once the rock drill operators are busy drilling, are remarkably similar, whether it is the distinct pebble conglomerate of the Ventersdorp reef being mined where you can virtually stand upright, or a very narrow 800mm wide platinum mining stope where you can only crouch, or a modern back-fill stope as described above.

Burawoy muses about how interesting it would have been to have 'someone else *repeat* the study either simultaneously or subsequently not as a replication but as an extension of my own study' on the Zambian mines in the late 1960s (1997:11, 1998:11). What follows in aspects of this thesis is in a sense exactly that - three decades later in another Southern African country across a number of mines. The simple point being made is that an ethnographic methodology can have its findings subjected to statistical verification and potential falsification under very different circumstances. While ethnographic participant observation is capable of producing research results independently of the employment of other research strategies, it interfaces productively with others, thereby enabling the quantification of its findings in specific contexts, or either confirmation or outright disconfirmation more generally. This implicates and can potentially satisfy the fourth principle of positivism, that of *representativity*.

2.8 Integrating quantitative and qualitative research methodologies

Having been involved in a series of social scientific research projects presented to institutions, of which one heard no more, I went looking for more practical forms of engagement in the mining industry, much as I had deserted my university post nearly 20 years before to get closer to the mineworkers and miners themselves. The research unit in my own university discontinued further collaborative 'consultancy-based' research activity. The university had, however, begun to encourage its staff to engage with institutional entities in society beyond its halls, and I embarked on two such projects before falling foul of the political culture in the mining industry, which finally pushed me back to this academic thesis.

The matter of integrating research methodologies arose while engaged in the *realpolitik* of a 'consultancy-based' research project. Management required a 'second opinion' of the research process and its qualitative research instruments and the quantitative survey to be administered to a five percent representative sample of 30 000 of its employees. As the research project was guided by experience based on qualitative research strategies, their concern was not misplaced: the central issue at hand is expressed as follows in a standard text on method in the social sciences:

> One of the problems with which qualitative researchers have always struggled, is holding their own in the social sciences debate. This is largely because it would not, and often could not, comply with the requirements set out by researchers for the quantitative paradigm (Babbie & Mouton 2001: 274).

While these authors compare the two methodologies (qualitative and quantitative) they provide no discussion or guidelines as to the relationship between these research techniques or research practices. In his standard text, George Ritzer (2000) proposes integrating what he considers to be the three accepted sociological research paradigms: the 'social facts', 'social definition' and 'social behaviour' paradigms. Briefly, the first holds that the *facts* can be established, the second prioritises how social actors define *their own situation*, while the third maintains that the *behaviour* of social actors provides the key to understanding social interactions (Ritzer 2000:630ff). I maintain that my methodological research practice came to embody aspects of all three paradigms which, while they are useful analytical distinctions, are less clearly distinguished in actual social scientific practice.

I now see this is what I was implicitly arguing for in a series of three documents (entitled 'Review of Process and Tools: Documents 1-3, October 2003') submitted to the co-ordinating 'high level team' (a consensus driven, yet closely senior board management monitored, group of individuals constituted by company, trade union, staff association representatives and researchers) for the review of the design and instruments for the research project. I now note that I was implicitly arguing that the relationship between qualitative and quantitative research strategies must be construed as a *process* that unfolds in the course of research. This review is relevant to parts of this thesis. The review process itself took two months, with the quantitative survey instrument being debated three ways, by management, the unions and the researchers, line by line and question by question with each constituency of the project making their input.

The management of the un-seen board-appointed steering committee had two concerns: that the research method deliver the desired research outputs and that the research instruments would not 'have the effect of raising unrealistic expectations on the part of

employees'. This concern related, in other words, to the problem of reactivity. The outcome of the review was intended to improve aspects of the research, 'increase the probability of the generation of the outputs required', make any 'recommendation as to the refinement of the method' and 'assist in guarding against the risks of raising unrealistic expectations on the part of the employees during the execution of the process'.

The trade unionists were aghast that an external 'third party' second opinion was required, deeming the researchers to be the 'third party' after themselves and management. A compromise was reached. Management, the unions and the researchers were all to nominate an independent reviewer of the quantitative and qualitative research instruments and the research method. The quantitative research instrument (on which the statistical data for part of Chapter seven (7.6) and Chapter eight of this thesis rests) consequently has the unusual merit of having been peer-reviewed by no less than three reviewers, whom it seems appropriate to name: Mr Tim Hart of the internationally represented resource development consultancy firm Steffen, Robertson and Kirsten (SRK-SA) conducted his review for the company, as did Professor Edward Webster of the University of the Witwatersrand for the unions and staff associations and Professor Roger Southall of the Human Sciences Research Council (HSRC) for the research team.

The independent reviewers, while satisfied overall, made a range of useful suggestions in a series of written comments on the research project (from which the quotes below are derived) and which were implemented in the main. Their shared concern was the lack of structuring of the qualitative research aspects, particularly the in-depth interviews and focus groups. In brief, while Hart found that 'the elements of the method appear sound', he expressed a concern regarding the 'lack of a clear progression from one to the other' and how 'the differing data gathering modes interact'. Webster similarly considered that there was 'too little indication given' as to how the two primary research tools - the qualitative focus groups and in-depth interviews and the quantitative survey - were to be integrated to enable the research 'to be more than the sum of its different parts'. Southall wished to have greater clarity on the initial 'immersion' phase of the research, indicated that 'social interpretation of the data is required' as 'the very best social scientists may

disagree as to the nature and significance of the findings', that 'there may be no one answer' and that researchers 'be cautious about findings being too "neat" '.

The results of the research were to be far from neat in relation to the expectation that social science would definitively resolve the issue of which particular shift system or working time arrangement to adopt. This thesis will similarly reveal the complexity involved in dealing with the restructuring of working time, as explicitly implied in the comments of two of the independent reviewers. Hart suggested that 'an issue to be considered is whether the study will (or should) facilitate debate that may move beyond current orthodoxy', while Webster said:

> I believe this study has the potential to open up a debate about the options facing the company over working time. There are however no clear or easy issues around working time. But what is clear is that a zero-sum approach to the working hours' debate, by either employers or trade unions, is unlikely to yield positive results. In short, an agreement on working time needs to be part of a wider process. This research can make an important contribution to such a process if all the parties accept the credibility of the researchers and their methods.

Such a debate has yet to take place. It is the intention of this thesis that it become part of such a debate and explicitly positions itself as an intervention in what will hopefully be a 'wider process' of discussion regarding the value and implications of working time and restructuring labour time.

2.9 Integrating historical evidence

I hold that sociologists must be primarily concerned with contemporary life. While good sociology must, I maintain, be historically sensitive that does not mean all sociology must be historical sociology. I thereby explicitly seek to justify, in a line, my dependence in this thesis on the secondary literature for especially Chapters four and five.

In addition, in responding by way of a social scientific research project to the worker organisations and management of the platinum mining house (Chapter eight), the

obligatory literature survey proposed culling any lessons learned from the historical experience of the South African mining industry and conducting an international scan of the contemporary literature on working time arrangements. It soon became apparent that the issue of working time had been a contentious issue for over a century on South African gold mines, and that, internationally, research in mining settings regarding working time, and shift work in particular, was 'very rare' (Heiler 2000:2).

For the purposes of this thesis, the initial summary historical overview for the company project conducted was explored in considerably greater depth. The project resulted in the emergence of the central research question and prompted an in-depth review of the secondary literature to source the evidence for the stability of working time treated in Chapter four. The recognition that African workers had been subject to a second form of temporal discipline, by the way of the labour contract, was then developed and is treated in Chapter five. A comment regarding the methodology of these two historical overviews, based primarily on the secondary literature, is consequently necessary.

A wide range of scholars, across various social scientific disciplines, make note of working hours and aspects of working time arrangements on the diamond fields and the gold mines in South Africa. They generally do so, however, only in passing. Chapter four tracks these references, culled mainly from the secondary literature, and reveals a crucial characteristic of working time in South African gold mining.

The methodology of Chapter five differs considerably from that employed in the periodisation of industrial working time, which was gleaned largely from fragments in a wide range of literatures and motivated by the absence of a dedicated focus on industrial working time arrangements. By way of contrast, the labour contract has an exceptionally rich and dedicated body of scholarship within which to locate itself. With labour time as the guiding conceptual prism, this chapter points in a number of directions, each of which is profitable for further research. The chapter is considerably consequently less focussed than the one which precedes it and somewhat programmatic in character. The chapter can be viewed as a historical summary literature review of evidence drawn from the

secondary record, grounding the eventual 'stabilisation' of labour by focusing on its key mechanism: contract length (see Crush *et al* 1991).

In this more extensive literature, the labour contract has received attention as an index of labour migration, generally viewed from the perspective of labour-supplying States and the absolute numbers of people involved. The *length* of the contract has equally received some attention in the context of analyses of the coercive, institutionalised industry and State-sponsored extra-economic processes designed to secure sufficient labour at favourably low rates of pay to ensure profitable mining. My motivation for examining contract length, however, was to use it as a measure of urbanisation and proletarianisation. Chapter five not only consolidates a wide range of references to contract length, but treats the systematic lengthening of the labour contract, over roughly a century, as evidence of how contract length was used as a mechanism to crucially *retain* labour on the mines in the context of the immense challenges the industry faced to *acquire* it in the first place.

Chapter six treats the value-creating role of labour time expended in the heart of production by critically applying and modifying Eric Olin Wright's analytical schema (1981) decomposing the working day in both the historical and contemporary context of the underground mining rock-breaking labour process. Wright expanded on Marx's well-known distinction as he sought to address the neglected role of value in the labour process *in specific relation* to social research and as an *explicit critique* of abstract theorisation around the labour theory of value, both pertinent to this project. To the best of my knowledge Wright's series of analytical distinctions regarding the decomposition of the working day have not been applied or empirically tested in any context, let alone that of mining.

Chapter seven examines the restructuring of working time in the contemporary period from the 1990's onwards. The chapter shows how, when a value-theoretic perspective is applied, the diametrically opposed views and practical options labour and capital adopt

regarding the restructuring of working time arrangements, is explained. This chapter provides the historical background to the two chapters which follow.

2.10 Intervening in restructuring labour time

The set of circumstances that led to applying social science to a struggle over working time in the platinum mining group and the rigours to which the project was subject is very briefly introduced at the beginning of Chapter eight. Chapter nine but descriptively treats a direct intervention when I was required to resolve an impasse between capital and labour over working time. The chapter is an account of a struggle centred around a fiercely independent group of rock drill operators and their long struggle with management. It is also the story of what happened when my radical theory met practical production politics.

In both cases a struggle between capital and labour over labour time amounted to a struggle over control over the labour process, implicating power relations between capital and labour - in one case between corporate head office and trade unionists, and in the other between 450 autonomously organised machine rock drill operators and regional managers - with oversight of corporate head office. As will be seen, actual struggles over production issues take centre stage.

Analysis of the actual engagement on the working time issue of annual leave illustrates the complexity entailed in changing working times. It will do so by revealing a remarkable degree of workers' autonomy (and their struggle with supervisory managers), particularly among rock drill operators who literally risk life and limb in mining production. The objective power of this echelon of the labour force, it will be intimated, requires increasingly sophisticated managerial strategies to resolve seemingly intractable and contradictory conflicts - maintaining profitability, and accommodating the demands for reduced working hours by a strategically located labour force which is objectively powerful by virtue of their position in the labour process and the inordinate length of time they spend at work daily.

2.11 Ethical considerations

Over the past decade, consent forms were not signed by the vast number of informants met informally while on numerous sites in the course of using participant observation as a research technique. For all practical purposes, the method precludes the very possibility of doing so. You do not ask the man alongside in the queue awaiting the medical examination to sign a consent form in order to engage him in what is for you, as researcher, a potentially illuminating conversation. Consent was informally obtained in practice, as introducing oneself and explaining your job was automatic and invariably par for the course. In these instances, notifications that there were researchers on site were nevertheless conveyed through a wide variety of official channels. As noted above, where roughly only 300 mineworkers out of 4 500 men would attend union meetings where researchers were introduced and the aims of a research project were outlined, clearly not every compounded mineworker would have been abreast of the presence of researchers.

At the mining group where the research for Chapters seven and eight took place, initiated as a result of a trade union struggle, workers were almost inevitably only too willing to talk to researchers. Where managers were unwilling to do so, they simply did not attend the focus group sessions to engage with the company-sanctioned research project. In this instance, where 5% of 30 000 workers were interviewed, interviewers routinely indicated that participation was not obligatory and information provided was anonymous. Only four or five out of over 1 500 worker informants declined to participate; two workers I was to interview were clearly simply in a hurry to get back to their quarters after their shift, made their excuses and hurried off.

In order to guarantee anonymity, the raw data for this project were, regrettably, destroyed three years after the project took place. One mine manager was uncomfortable with the tape recorder, but was not in a position to duck the interview seeing the research project was initiated by his own head office. He would have declined to give consent if he had a choice, and was the sole case of a reluctant informant I ever encountered.

There was, I maintain, no question throughout the past decade where informants could be even vaguely said to have their integrity impugned or wish for anonymity violated. During a session on the mine where the practical facilitation intervention recorded there took place, recounted in Chapter nine, a manager was not happy with even sitting down to a meeting with the trade unionists, chaired by the writer facilitating the conflict. When he was required to answer *their* questions, he simply got up and left, only to be followed by apologies from his colleagues and the comment later that he was 'not the right man' for the job at hand.

Confidential information provided by the company for the purposes of research was, in all instances, covered by confidentiality clauses in legal contracts. Despite the fact that these legal contracts, generally applicable for a period of five years, have all lapsed and are technically no longer in force, certain information - all applying to internal company documents and financial information of potential benefit virtually solely to their competitors (and possibly potential investors) in the mining sector - has been honoured. To guarantee confidentiality the name of the relevant mining company has been changed to a pseudonym in the citing of the titles of two reports used as primary material in this thesis.

2.12 Conclusion

This chapter has been devoted to tracking actual methodological research practice over nearly three decades and the subsequent rooting of the findings in a historical perspective. In the process, my initial research role of fieldwork organiser graduated to heading up a major research project involving a core team of four researchers, over 30 field workers, many more interlocutors and more than 1 500 respondents across the full range of occupational and professional levels in five data gathering streams in what was a politically sensitive, technically complex and socially diverse situation.

The chapter briefly outlined the learning process and detailed how research was conducted, thereby enabling the evaluation of the methodologies employed as well as an

assessment of the method striving to make adequate social scientific epistemic knowledge claims.

While I merely footnoted the point that disinterested behaviours of the social researcher are not possible, this does not preclude the possibility of achieving greater objectivity, nor that ever more epistemically adequate knowledge claims can arise. My abiding concern with meta-theoretical issues has, I maintain, at least ensured guarding against making generalisations more broadly than the empirical data on which they are based. I have all too briefly suggested that direct experience constitutes the beginning of knowledge, and that, in extending from one's actual site of research, *a la* Burawoy, adopting a 'panoptic' perspective is possible, thereby noting that positivist criteria for knowledge are perhaps more readily applicable to social science than he recognises and should be revisited anew in the conducting of social and historical inquiry, not eschewed. The cue for adopting this stance derives from having adopted an agent-sensitive approach prioritising workers' experience and the strong claims those working at the rock face make. This must constitute the researcher's first moment of learning.

Once acclimatised and more familiar with the vast artificial underground environment, the range of possible interpretations of its goings-on becomes clearer. The possibility of a more objective stance results from a prolonged period of practically based intellectual labour time spent on different sites. Researchers must first have learned to survive and make their way around the diggings before being able to join in the debates and contestations, which must result in specific actions and activities and upon which life can depend. It was only this experience that made it possible to take on and win the trust of workers, organised labour, managers and company management in order to engage at the institutional level when both sides had run out of options when confronting one another. The job was to be objective and non-partisan, embody this commonly held view of science, and be able to quantify findings predicated on actual knowledge of how a mine works and how work proceeds, without which the researchers would have had no standing. The key research requirement was to assess a failed work time experiment, and to evaluate worker, supervisor and manager employees' preferences and constraints to

restructuring working time arrangements. This both presupposed some understanding of, and provided the spur to, further exploring the value of labour time.

3 The value of labour time

> *… even if there were no chapter of 'value' in my book, the analysis of the real relations which I give would contain the proof and demonstration of the real value relations. All that palaver about the necessity of proving the concept of value comes from complete ignorance both of the subject dealt with and of scientific method.*
> Marx & Engels (1975:196)

> *… all labour time is necessary, i.e. wage-producing labour time.*
> Marx *Grundrisse* (1973: 574) (my emphasis)

3.1 Labour time and *value*

In this study the role and significance of labour time and its family cluster of generally under-theorised conceptual cognates such as working time and industrial time and their referents - hours and days, the length of the working week and labour contracts - are examined over an extended period in a specific historical and social context. The general theoretical aim is to provide an explanatory basis for the significance of the stability of working hours and the mining industry's defence of the virtually unbroken continuation of relatively long working hours ever since 1911. The explanation of the expenditure of labour time in relation to the configuration of the mining labour process will begin to account for the 'testing' of the value of labour-power by mining capital as the migrant labour contract is increasingly lengthened and the long struggle of organised white labour to reduce industrial working hours is resisted by the industry. The historical experience of a deeply racially divided mining working class, framed by two parallel labour time regimes (with African workers subject to both temporal regimes), emerges as central to these developments.

It will be more broadly argued that the South African mining industry, despite its increasingly capital-intensive character (Innes 1984), remains, at the heart of its labour process at the rock-face, a predominantly absolute surplus value extraction regime[40] requiring relatively long working hours. The transition from the formal to the real subordination of labour to capital remains incomplete, along with the consequences (not all of which can be examined here) for understanding the vicissitudes of the changing value of labour power, the relation between productive and unproductive labour, the relation between unskilled and skilled labour, as well as worker subjectivity. Even fairly recent highly informative work issuing from the metropole, regarding Marx's distinction between formal and real subordination (see Neilson 2007), for instance, is consequently of limited value in analysing the local mining context. More broadly than mining, the 'return' to forms of organisation representing absolute surplus value production regimes has merely been noted (Ngai & Smith 2007:42).

Labour time must, it will be argued, be conceived as central to the organisation of the mining labour process and the broader process of valorisation occurring within it. Once so conceived, the evidence to be presented, focused primarily on production in the underground mining labour process, permits labour time, *qua* concept, to play a powerful role in explaining a wide variety of social phenomena. Critically, for instance, important aspects of class formation - intra-working class occupational differentiation in particular - come to light.

Seeing that the divide between labour process analysis and Marxist class theory, 'widely recognised' over 15 years ago (Carter 1995), still appears wide open, it could do with an offering that may begin to remedy the hitherto generally accurate charge that 'labour process theory has lost any clear focus, that it has been depoliticised, and that a "core theory" needs to be reiterated' (Rowlinson & Hassard 1994:66). While at least two important texts (Burawoy 1985, 1979), for instance, need to be exonerated from the main charges, the 'core theory' does need revisiting.

[40] Along these lines, an experienced and senior white mine inspector asked me if I thought mining was still 'primitive'.

Closer to empirical realities at home, the analysis presented here further claims to *complete* the widely held view that the profitable mining of low-grade ore bodies at considerable depth was predicated solely on low wages for black workers. For wages are but fetishised epiphenomena: the social expression of labour time expenditure under capitalism. The class-based exploitation of mine labour requires a deeper explanation than simply citing low wages as the evidence for it. As wages are only part of the distribution of total economic value produced - extracted from labour-power over time in the labour process - an explanation for the creation of surplus value in terms of labour time expended in the labour process provides a deeper, more satisfactory production-orientated account than attributing a large measure of the accumulation of mining capital to low wages, whether 'cheap' or not, located in the realm of circulation.

The intention then is to begin to outline a conceptual basis for the centrality of labour time, both *qua* concept and as social phenomenon, by analysing the temporal (value-creating) dynamics of the labour process itself. It will be argued that labour time must be reconsidered anew, inextricably embedded as it is in the organisation of the labour process, for therein lies the origin of what becomes the valorising logic of capital that frames the struggle between its representatives and those of labour as manifested in a variety of forms of social contestation. This endeavour, however, needs to track some comment regarding labour time in the labyrinthine debate around interpretations of Marxist value theory.

The chapters to follow will empirically show the inextricable linkages between the key Marxian concepts of class, class struggle and the labour process, and how these concepts are integrated and illuminated in very meaningful ways around the expenditure of labour time. This becomes clear when the social phenomena these key concepts designate play themselves out in 'real' time under both historical and contemporary conditions in the South African mining context. This may assist mending the 'unhelpful split' between abstract labour value theory and more empirical labour process analyses (Wheelock 2001:174).

After noting something of the extent of the literature on the sociology of time and its central refrain, this chapter opens up the discussion by briefly noting the surprising extent to which labour time has suffered neglect, both conceptually and substantively. It then addresses the social character and socially constructive capacity of time itself by drawing the oft-quoted distinction between a 'task' and 'time' orientation to work (Thompson, 1967). The analysis of two of Thompson's critics, Glennie & Thrift (1996), is briefly noted to make the point regarding the neglect of labour time *per se*.

The concept of labour time is then located in the context of on-going debate around Marxist value theory. This section alludes to how the construal of labour time, as a solely quantitative measure of value, lies behind the narrow economic focus dominating interminable and long-standing discussion around the 'transformation' of value into prices. Concerns around Marxist value theory, however, have again taken root in the past few years (Kicillof & Starosta 2007b:9). The recent overview by Andrew Brown is a good example (2008). While abstract labour is currently central to this on-going debate, the measure of value, labour time, appears to be emerging as prominent (see Bonefeld 2010; Kicillof & Starosta 2011; Carchedi 2011; Bonefeld 2011). This implies a justification for a focus on labour time and its central theoretical role within Marxist value theory.

What follows then highlights a view that value is pre-eminently a relational concept and is 'constitutive' of social form, a much-debated view initiated by Marx, developed by Rubin (1972) and applied more generally to advanced capitalist societies as a whole by Postone (1993). Postone foregrounds how labour time is an indispensable element in the Marxist construal of value creation under capitalism and is generative of social form or, is in other words, socially constructive at a structural level of social formation. The magnitude of value, as measured by socially necessary labour time and which, following Marx without critical comment, appears to be accepted as uncontroversial (Bonefeld 2010), assumes special focus. Also using Marx's locution, more specifically, for Postone, social formation emanates from the expenditure of *direct labour time*, although this is not, for Postone, the direct labour time of the working class, but rather that of socially undifferentiated 'people' and for which he has been rightly criticised (Arthur 1994; *Aufheben* 2007:5).

This insight, nevertheless, becomes a central *motif* for what follow in this theoretical discussion.

The final section roots this discussion in production in an economically developing context. It introduces Eric Olin Wright's (1981) value-theoretic decomposition of the working day, which further disaggregates Marx's distinction between absolute and relative surplus value extraction. Wright's instructive analytical schema was completely ignored in the heat of the early debate around Marx's value theory and the fierce criticism he faced from the likes of Geoff Hodgson (1981) and Pradeep Bandyopadhyay (1981) almost thirty years ago. Wright never returned to the theme.[41]

Wright's analytical schema is only introduced in this chapter. In Chapter six it is spelled out in greater detail and employed as a conceptual guide in analysing the working day in the mining labour process underground. This empirical examination makes clear how labour time expenditure, viewed through Wright's value-theoretic lens, results in a series of distinctions as to when labour-power, harnessed in the labour process, creates value and when it is excluded from doing so. Such an examination further shows how this analysis illuminates a range of issues around how time is spent during the working day and the social struggles surrounding it.

3.2 The sociology of time

There are a very broad range of complex disquisitions and commentaries on time in the sociological tradition. These studies virtually all hinge on or even reduce to the idea that time is socially and historically constructed.

There have recently been studies on the work of Simmel (see Scaff 2005), Garfinkel (see Rawls 2005), Mannheim, (see Kettler & Loader 2004), Mead, (see Strauss 1991) and Durkheim (see Katovich 1987; Watts Miller 2000). A theory of time implicit in Weber has been reconstructed in the context of a further number of studies detailing various

[41] Personal communication, 17 September 2007

aspects of the 'structures and meanings of social time' (see Segre 2000). Such conceptual and theoretical constructions are as varied as the societies these theorists observed. Despite these relatively recent studies, 'time is still a neglected area of study' (Rawls 2005:186)

At the contemporary cutting edge of research in the sociology of time, moreover, the results issuing from 'daily time use' data, where informants keep detailed daily diaries of their activities, it has been suggested, are suitable for mapping 'societal changes' (Glorieux, Mestdag & Minnen 2008:66). Also called 'time budget studies', in the Soviet Union such studies *did* have as their focus the rational use of working time in the 1920s. In the 1930s the focus shifted to examining the effects the shortening of the working day had in 'the building of socialism', before branching out to cover 'the whole of everyday life', particularly 'women's double burden'. After a gap of 20 years, in the 1950s 'the problems associated with the transition from socialism to communism' came in to view, only to revert in the 1960s to working time issues and 'the first scientific congress' with the theme of 'Free time of workers with the shortening working time' (Julkunen 1977:16-17).

In Western societies overall, Marx's ideas about time, 'although the idea of time was fundamental in his thinking', 'remained largely unexamined' until Moishe Postone's *Time, Labour and Social Domination* was published in 1993 (Miller 2004: 209). This assertion holds despite the fact that since the 1960s, a number of Marxist writers *did* investigate the socially constructed nature of time. See for example Thompson (1967), Debord (1994 [1967]), Benjamin (1969), Althusser & Balibar (1977), Lefebvre (1987) and Osbourne (1995) as noted by Miller (2004: 210, footnote 1).

Carol Gould (1978) is one of the few Marxist theorists who significantly made a distinction between the concept of labour and that of time. But her self-admittedly very strong claim, in articulating her Marxist social ontology, failed to address the matter of labour time *per se*. Gould nevertheless articulates the underlying assumption of this thesis, regarding its position on time as such, by saying:

> Let me begin with a very strong claim: that for Marx, in the *Grundrisse* at least, labor creates time or introduces time into the world. Thus according to Marx, "Labor is the living, form-giving fire; it is the transitoriness of things, their temporality, as their formation by living time" (1978:56).

There is agreement, for a change, both in Sociology in general and in Marxist traditions, around the central issue: time is a socially and historically constructed phenomenon. The *social* character of time has consequently imbued 'most social scientific' accounts (Urry 2000). The concept of time has, theoretically at least, been divested of its absolutist character and assumed a role subservient to the course of social and historical development. The 'sociology of time' has consequently become an extensive field of study in its own right (Segre 2000).

Yet even though time is conceived as a social construct, the individual and social *experience* of it has not. For 'time' remains an 'objective fact of daily life', a 'commonly held standard' and not only one by which we organise our lives, but also one 'in terms of which we assess and judge all manner of social behaviours and subjective feelings' (Harvey 1990: 418). Similarly, it has been suggested that the 'socially and historically constructed' division of time into (temporal) units has resulted in 'certain objective constraints' which are 'in some sense 'objectively' given' (Heydebrand 2003:150). Time consequently matters, and is possessed of social and historical import and causal capacity. Frederick Winslow Taylor, for instance, considered his precise calculation of 'time units' to be 'by far the most important element in scientific management' (Taylor (PS) 1979: 23). These 'unit times' were of course 'labour times under conditions of capitalist production' (Taylor (PS) 1979: 32) and did not represent the discovery of immutable scientific givens as FW Taylor thought.

All of this explicitly affirms the social dimension of time. The issue at hand here is the fundamentally social character of labour time, and how disaggregation of the concept illuminates the *genesis* of value in production and reveals a series of social effects, thereby foregrounding the critical importance of the expenditure of labour over time in the labour process on South African mines.

3.3 The neglect of labour time

The powerful explanatory conceptual category of labour time has, until fairly recently, largely been neglected. Labour time is often passed over after having been noted or briefly defined. The question arises as to why this is the case. The full answer awaits writing. The simple and quick answer arguably resides in the deeply entrenched understanding of the concept of time itself. For 'time' has long been treated, Norbert Elias argued, as a Newtonian-influenced, unchanging and unquestioned Kantian absolute and unalterable 'given' (Dal Rosso 2002). This is surprising when considering the modern sociological conception of time. For while the study of time has taken manifold directions, the subsidiary concept of labour time has not received the critical theoretical scrutiny it is due.

Regarding the relevance of studies on industrial working time, a clutch of authors a few years ago suggested it was 'hardly possible to pick up a newspaper or to turn to the radio without hearing something about the relationship between time and work', before going on to detail something of the extent of this literature (Rubery *et al* 2005). Yet despite the extent of scholarly work done on time, and working time in particular, at least one writer has asserted that 'research on time and working time is badly needed' (Dal Rosso 2002). The same claim has been made for studies regarding the working of overtime (Hart 2004), which had previously explicitly been examined in the light of its socially constructed character (Martorana & Hirsch 1982). A claim made 20 years ago, that it is surprising that working time 'has not been the subject of lively debate' (Blyton 1991:461), still largely holds true.

There are exceptions. Chris Nyland's (1989) sustained focus on reduced worktime and the management of production is an important one. There are further studies on 'working time', a notion that has served as a theoretically bland substitution for the rich, qualitatively imbued concept of labour time. Two solid collections of articles that fit this bill are Blyton *et al* (1989) and Golden & Figart (2000). In the latter collection, while Burkett (2000:143-158) points to the 'contemporary relevance' of Marx's analysis of the

'natural, social and political limits of worktime', Marx's fuller concept of labour time as a guiding category remains somewhat in the background.

Dedicated work focusing specifically on the concept of labour time itself appears to be virtually non-existent, with the critical analytic disaggregation of the concept of labour time very largely overlooked in Marxist theory, despite the fact that 'time at work structures all other aspects of daily life' (Johnson & Lipscomb 2006: 922). This is all the more surprising given the centrality of labour time in the labour theory of value and the complexity of long-standing debate revolving around 'the specificity of value-producing labour', a debate which is 'far from being closed' (Kicillof & Starosta 2007b: 41) and to which Bonefeld's recent contribution (2010) has 'provoked some debate' (Bonefeld 2011:475). Generally though, in many key Marxist texts and in discussions on the labour process, for instance, labour time is very often not even mentioned, or is either inadequately defined or not defined at all. A few apposite examples will support this contention.

In *Americanism and Fordism* Gramsci could only note, *apropos* labour time, that Fordism was the 'wearing and exhausting… consumption of labour power and a quantity of power consumed in average hours which are the same numerically…' (1971:311). While he discussed time and motion studies, Harry Braverman did not even define labour time, simply saying that labour-power is what the worker sells and the capitalist buys, namely '…the power to labour over an agreed period of time' (Braverman 1974:54). Michael Burawoy does not mention the concept in *Manufacturing Consent*, despite the critical importance of the time-study man's role in the 'securing and obscuring' of surplus value and the fact that workers 'consent' to their own exploitation hinges on voluntarily producing more in the same temporal span of labour time (1979). In the early post-Braverman labour process literature, analysts Kraft, Noble, Yarrow and Brecher do not mention labour time (Zimbalist 1979), nor do any of the contributors to Wood's neat edited collection of articles, featuring writers such as Elger, Beechey and Littler (1983). The concept of labour time does not feature in the 'Glossary of Labour Process Terms' in Thompson's book devoted to introducing debates on the labour process (see Thompson

1983: xiii). In *The Politics of Production*, Burawoy does defines labour time as the measure of '…the "value" of wages: that is, the amount of labour time socially necessary for the reproduction of labour power', but then a general silence descends (1985:28).

At home in an industrial context, virtually the same can be said of Eddie Webster's *Cast in a Racial Mould*, where, in crucially presenting Marx's distinction between absolute and relative surplus value, we find labour time but passed over in general terms, even while noting the key point regarding social necessity to be discussed at length later: 'Surplus value, he [Marx] said, can be increased not only by lengthening the working day - absolute surplus value - but equally with a given length of the working day, by reducing the length of the period of necessary labour time' (1985:2).

Even worse, seeing that for both Adam Smith and Karl Marx labour time was conceived in terms of both its *duration* and *intensity*, Marxists have generally but given a 'formal nod' or ignored the *intensive* component of labour time with 'units of labour power, hours, days and so on' being 'treated as homogenous concepts' (Nyland 1989:16). It is precisely matters relating to the *intensity* of time spent at work that come to the fore when a more clearly disaggregated notion of labour time is employed. This applies equally to both the historical evidence to be presented here and the accounts to be provided of contemporary struggles at the point of production.

Where the struggle over labour time has been treated in a historically substantive and detailed manner, such as in Roediger & Foner's (1989) masterful history of American labour, these writers do not significantly advance our theoretical understanding of labour time or time's relation to the labour process. The same can be said of the only substantive full-length local study on working time, a focus on shift work in the South African rubber and tyre industry (Adler 1991), as well as the few shorter local studies on working time.[42]

[42] There are only a handful of local studies on the topic, the most substantial being those of Taffy Adler (1986), Paul Lundall (1990), AJ Kielblock (1995), Peter Lewis and T Wegner (2000) and Glenn Adler (2001). Taffy Adler's ground-breaking study was born out of union involvement in the rubber and tyre industry and covers a good deal of ground. Lundall's important study argues for reduced working hours. From within the mining industry, Kielblock's 1995 Safety in Mines

Given the paucity of work in our local economically developing context, on either time in general or labour time in particular, and given the lack of work representing a theoretically informed and specific, historically contextualised and empirically detailed account, what follows begins to fill the gap.

3.4 Labour time as socially constructive

> *In **Capital** it is the class struggle over labour time (and everything that directly or indirectly affects it) that explains why a given productive configuration (the methods of production and quantity of labour actually performed) is as it is and not otherwise.*
> George Catephores (1989:60)

Over a thousand years ago, time was reckoned as perfectly symmetrical. It was delineated by regular prayer cycles in both Christian and Islamic traditions, thereby mirroring the perfection of a monotheistic deity. These socially embedded conceptions of time were compelled, however, to become *asymmetrical* in order 'to leave the morning free for work' (Le Goff 1963:597-600, cited in Riis 1990:67-9). Time spent working[43], or labour time, consequently revealed itself as the archetypal socially constructive force, powerfully structuring human society. Changes in the very conception of life, the experience of time itself, the shape of social practices and orders, as well as the formation of social classes, each fulfilling various temporally bound social duties and obligations, took shape around the expenditure of labour time.

Research Advisory Committee (SIMRAC) study is a comprehensive literature overview of work done to establish basic criteria for continuous working schedules, while Lewis's 2000 SIMRAC feasibility study - a multi-variate analysis - attempted to relate working time and bonus payments to safety and the severity of injuries underground, and did not, by its own lights, meet with success. Glenn Adler's edited collection consists of four substantial articles across the mining, transport (long-haulage), retail and metal sectors with an introduction advocating the 40-hour working week.

[43] 'Working time' represents a quantitative measure of time in terms of hours, days and weeks. This distinguishes it from the value-laden concept of labour time, imbued with both quantitative and qualitative dimensions.

It has similarly been argued that 'the economy of labour-time' was the first measure of co-operative organisation in primitive society (Mandel 1977:60). Citing much anthropological evidence from the secondary literature, Mandel made a strong case for the priority of labour time in the very emergence of social structure. Time for work has always assumed precedence over (and structured) the temporal regimes within which the multiplicity and diversity of forms of social activity and life take place.

Social struggles over labour time were the first contests between those who worked and those who employed a labour force that was in some sense 'free'. For, 'in employment, control of time is made visible' (Bell 2001:45). In the 13th century, for instance, among daily paid cloth-workers, conflict was focused on the length and definition of the working day (Le Goff 1980:45-46, cited in Postone 1993:210). In 1349, during the reign of Britain's Edward III, a 'statute of labourers' was promulgated to control the length of the working day with British guilds as early as 1321 relying on 'ordinances' to set official work hours (Martorana & Hirsch 2001:18, citing Roediger & Foner 1989). As a result of these struggles over the length of the working day, the hour was soon to replace the day as the unit of labour time (Le Goff 1980:49).

Long before the advent of the earliest forms of capitalism, in other words, the extent and pace of labour time expenditure required for communal survival was dominated by the natural rhythm of the seasons and by day and night (Thompson 1967). This gave way, in Western society, to the regulation of society by the church bells of the monasteries and then by the work bells of the textile mills, the origin of the clocks erected in village and town squares resulting from society's struggle with the manipulated clocks in the workplaces of a merchant capitalist class (Le Goff 1980). The struggle over the control of time, it came to be seen, powerfully shaped the formation of society itself (Postone 1993: 200-216; Landes 1983; Le Goff 1980; Thompson 1967). With the control of time 'wrested from the church', labour time subsequently becomes commodified (Postone 1993:214), '…up for sale like a commodity, a thing' as Lefebvre puts it (1991:165). For Marx, the very fact that the working day under capitalism becomes subject to a linear temporal demarcation is 'unnatural', capital accumulation and competition breaking down

the ‘bounds’ and even ‘confusing’ the idea of day and night (Burkett 2000:147). For Giddens, these changes: ‘hold the key to the deepest transformations of day-to-day social life brought on by the emergence of capitalism’ (Giddens 1981:131, cited in Postone 1993:215).

3.5 Time as marker between pre-industrial and industrial society

With the advent of industrial capitalism, the temporal structuring and regulation of society, via the measurement of linear time, intensified considerably. The time taken to complete a labouring ‘task’, for instance, was replaced with the domination of ‘time’ as measured by the clock (Thompson 1967). When time is represented as linear, collective social actors and historical processes are, in general, both implicated in and influenced by the structuring of time (Thompson 1967). This way of measuring labour time has served as the standard marker between pre-industrial and industrial society.

In a European context, Thompson’s seminal work and his theoretical insights relate the nature of work to the shape working time and its measurement assume. The clock introduces mechanical linearity and the rationally segmented organisation of the working day. In the North American context, the same momentous change from ‘task’ to ‘time’ ‘gathered force in very small artisan shops embedded in a merchant capitalist economy’ (Roediger & Foner 1989:2). EP Thompson’s conception, grasping this phenomenon of time now being ‘spent’ as opposed to previously but ‘passing’, however, proves to be too static and rigid to capture the flux and diversity of combined and uneven social change.

Glennie and Thrift make a most thoroughgoing critique of Thompson’s ‘most influential account’, which was for long accepted as an ‘axiomatic framework’ (1996:275-277). Their ‘reworking’ of Thompson’s celebrated text reveals the limits of the binary distinction between work organised according to ‘tasks’ and linear ‘clock time’ (Glennie & Thrift 1996). Quoting work conducted since 1967, Glennie and Thrift suggest there are a ‘multiplicity of senses of time’; the concept of ‘time-discipline is ‘multi-faceted’; social time is ‘intrinsically manifold’; is ‘multiple and heterogeneous’ and its ‘regular,

standardised and coordinated time patterns', they argue, 'did not await' 'factory discipline', but had, prior to industrialisation, been manifested in 'prisons, work-houses and hospitals' (1996:278,283). Thompson's central concept of 'task-orientated societies', they go on, embodies an oversimplified notion of time. 'Time-discipline can exist without clock discipline' and workers were 'struggling as much against *more* discipline as against discipline about *time*', they assert (1996:284-28) (their emphases).

What is missing from Glennie and Thrift's analysis of the dispersion, diversity and multiplicity of senses and notions of time, however, is the central importance of working or labour time manifested in 'overwork' (Shor 1991), which is at the heart of 'the time-bind' (Hochschild 1997) and the 'time squeeze' (Southerton & Tomlinson 2005) which modern globalised society encounters.

3.6 Labour time and the labour theory of value

> *In the long history of debates over Marxian value categories it may sometimes seem that there are as many different viewpoints as there are authors who have participated.*
> Bruce Roberts (1987: 84)

To side step the hoary debates as to 'what Marx really meant' (Roberts 1987:97), a close examination of Marx's own account of the role of labour time in his value theory instructively introduces the basic issue. As in many other issues, 'the best discussion remains that of Marx' (Braverman 1974:53). This does not mean that quotations from Marx can settle the 'ambiguity that Marx left unresolved in his theory of value and labour' (Kay and Mott 2004:170): all the more reason, therefore, to attempt a rigorous exegetical examination of a sliver of his relevant texts. The ambiguity and the possibility of 'radically different interpretations', particularly of Marx's theory of value, as Kay and Mott point out, are, consequently, fully recognised (2004:170).

To proceed, Marx refers to an early formulation of a labour theory of value by the founder of English political economy, William Petty (1623-1687) who 'saw through the nature of value' (Marx 1977:57). Marx, however, approvingly cites at some length the 'English

communist', a Mr Bray, who, in his 'remarkable work' *Labour's Wrongs and Labour's Remedy*, published in 1839, preceded by others (see Grossman 1977:34), argued that 'it is labour alone which bestows value' and whose writings were an early formulation of labour time as the measure of value (Marx 1978:64ff).

It was Adam Smith, however, who had systematically theorised labour to be the sole source and measure of value, except that Smith vacillated conceptually between labour time as the measure of value and the value of labour itself, an error revealed by David Ricardo (Marx 1978:50).

By the same token, Ricardo, in formulating his political economy, linked the value of commodities to the definite labour time contained in them. Marx's well-known criticism of Ricardo was that he failed to differentiate between labour and labour-power. Marx opposed the purely *technical* view Ricardo had of capitalist production by revealing the *intensive* nature of human work, the *social* character of the capitalist labour process, and that capital was more adequately defined as a *social relation*. Ricardo, nevertheless, was the first classical economist who 'clearly and precisely demonstrated' the determination of value by labour time (Marx 1978:63).

Since John Stuart Mill, however, economic value was conceived to reside in the preparedness of a purchaser to pay for the use-value of a commodity. It was William Stanley Jevons, Leon Walras and Alfred Marshall who, in building on Mill's emphasis of the psychology of the individual purchaser as responsible for the value attached to commodities, introduced and developed the 'marginal utility' theory of value and who were responsible for ushering in neo-classical economics. Predicated on individual psychology, this view ostensibly precluded the need for a general labour theory of value and this view, in this regard at least, has remained foundational to mainstream (neo-classical) economics (Barber 1977).

From this perspective, with its assumptions embedded in the views of Mill and the 'marginal revolution', the fate of Marx's labour theory of value was thought largely to have been sealed by Bohm-Bawerk's (1851-1914) 'closure' of Marx's theoretical

'system' (Sweezy 1942). A generation ago this early critique was claimed to still be 'the most coherent and systematic challenge to Marxism by any bourgeois economist' (Kay 1979a:46ff). The final alleged denouement of the theory was Marx's alleged failure to find a solution to the 'transformation problem' - how total value in production translates into total prices in the market - eventually solved by Bortkiewicz (see Sweezy 1942) and then later by Shaikh (1977) by an 'iterative process' deemed to be 'more close to Marx's initial approach' (Mosselmans 2004: 340).

The concepts of labour time and value have consequently long been associated. It has only recently been argued that 'labour' and 'time' have been *de-linked*, with linear time reduced to an analytic tool (Mosselmans 2004). As an analytic tool in neo-classical economics, the measurement of time no longer relates to the *duration* of the labour time of either the individual worker or abstract labour in general. Time rather now refers to 'the length of the production process' itself. Labour time *per se* has consequently been completely eliminated from general neo-classical economic theory despite the continued preoccupation of managers with how long workers work.

This neo-classical economic logic has issued in the intensified development of what some theorists have called 'the 24 hour society' (Glorieux, Mestdag & Minnen 2008). Following this logic, in the instance of the theoretical object here under review - a definite quantity of labour time expended in the mining industry in South Africa - a mine should operate on the basis not of the 'man-week' (how long the worker is at work), but the 'mine-week' (the length of time the production process runs) - ideally for 24 hours a day, 365 days a year. This ideal and new measure of time in economic activity, it will be shown, is subject to a process of continuing struggle between contending social classes. This further points to the role and significance of labour time, as well as to the extent to which the expenditure of labour time results in new, though contested forms of social organisation over attempts to extract greater surplus value from those who labour. Social relations and forms of social organisation are consequently revealed as being both produced by and constitutive of value *per se* and issue out of specific working time

arrangements designed to extract surplus value from labour power expended in production over time in the first place.

That neo-classical economics has banished time from the calculations of the value of labour-power has not, however, precluded empirical work in Marxist value theory from continuing. Anwar Shaikh's reworking of the labour theory of value has, for instance, been held to have initiated the 'third phase' of empirical Marxist research (Cockshott, Cottrell & Michaelson 1995). Indeed, the work of Shaikh (1984), Moseley (1991) and Dunne (1991) has led to a '…revitalisation of the classical Marxian labour theory of value, along with a reassertion of the relevance of the distinction between productive and unproductive labour' (Cockshott, Cottrell & Michaelson 1995:55).

The results claimed of this phase of the debate over Marx's value theory are significant. The contribution by Cockshott *et al* (1995) arguably does indeed confirm the validity of the labour theory of value, confirm Marx's immiseration thesis and show that the rate of profit has a tendency to fall. The commentator Maniatis certainly argues they '…verify the general predictions made by Marx regarding the long run behaviour of the rate of surplus value, the organic composition of capital and the rate of profit in the case of the UK economy', leading him to suggest that empirical Marxists need to develop a common methodological framework 'to test the major tenets of Marxist theory' (Maniatis1996:37). This empirical evidence provides strong grounds for revisiting Marx's value theory. In this literature, 'empirical' is clearly understood in its *quantitative* sense (Cockshott *et al* 1995). The role of labour time, centrally embedded within it, consequently remains worthy of renewed *qualitative* empirical attention in specific social and historical contexts.

3.7 Revisiting the relation between labour time and *value*

> *…the economy of time, along with the planned distribution of labour time among the various branches of production, remains the first economic law on the basis of communal production.*
> Karl Marx (1977:173)

Within a Marxist problematic, what has, *inter alia*, been in dispute (and remains enigmatic) is the significance of the creative capacity of labour in the creation of value over time and the nature, character and source of value itself. Within this tradition this question was recently posed in the following manner: 'Where does the value-form of the product of labour, which distinguishes commodities from any other form of social wealth, come from?' (Kicillof and Starosta 2007b: 18). In beginning to answer their own question these authors suggest Marx's *Capital* bears closer examination. They suggest that it is the general exchangeability of value or the money-form that gives commodities their mystical character, '…the *genesis* of which the critique of political economy needs to explain' (2007b:18) (my emphasis). This origin or *genesis* of value is what I seek to track down by analysing labour time in production. The issue continues to turn on the fact that 'the exact relation between "value" and "labour" is hard to pin down' (Arthur 2004:98). The examination of labour time expenditure in production under socially and historically specific conditions is, I suggest in turn, where a start should (again) be made. For: 'By making labour time "socially necessary" he [Marx] puts it in a *context*, of a branch of industry or production, so that it is possible to speak of an *average*…' (Schwartz 1982:80) (my emphases).

Under capitalism maximising profit entails reducing the necessary labour time it takes to reproduce the labourer and the working class family dependants. This generally requires advancing the productive capacity of the technology employed. As is all too well-known, this divides labour time expenditure into Marx's two distinct analytic components: absolute and relative surplus value (1977:476-497).[44] These aspects of the working day can and generally do occur simultaneously, despite the fact that one or the other tends to

[44] Eldred and Hanlon (1981) 'reconstruct' these concepts in a model that has the 'simplifying assumption' that 'value is created uniformly over the whole working day'. I show clearly with reference to empirical evidence that this does not and cannot happen, and that any 'modeling' must take this into account if it is to be embedded in the historical process. That value can only come into play *post hoc* once the commodity has fetched its price on the market - a key aspect of their argument - does also not apply in the case of the money commodity gold, at least until 1970 when the gold standard of $35 an ounce no longer applied. This year was, not accidentally, the year wages for black mineworkers began to rise dramatically in real terms for the first time since 1911 (see Wilson 1972), but this issue is not pursued here.

characterise particular stages of development of capitalist societies. Absolute surplus value extraction is limited by the physiology of the human body, the exertion of which can only be intensively sustained over a certain duration, which defines the maximum length of the working day. While relative surplus extraction can be massively increased through the ever burgeoning development of the technological forces of production as well as by the intensification of labour and wage cuts or a combination of these strategies, it too is similarly limited absolutely by the temporal cycle of a 24 hour day.

Within this well-known schema the three interrelated concepts of labour time, value and exchange value are embedded. Early on in the renewed controversy over value theory, Diane Elson (1979:127ff) argued that a range of scholars tended to reduce these to two categories. The Soviet scholar Isaak I Rubin (1972:64) understood value as residing chiefly in the process of circulation, for which he has been criticised (Kicillof & Starosta 2007b). More importantly for my purposes here, Rubin ignored labour time expended in the sphere of production, despite nominally recognising the 'centrality of the productive forces and [his aim] to provide a more "production centred" approach' to the question of value creation (Kicilloff and Starosta 2007b:11). Concerned with the early phase of attempting to socialise the economy of the USSR, Rubin's focus was the total magnitude of abstract labour representing *value* (Rubin 1972). For Rubin, however, value was not merely the regulation of the distribution of social labour, but was also 'an expression of the social production *relations among people*' (Rubin 1972: 67) (his emphasis). Critically, for Rubin, 'value is a *social form*' (Rubin 1972:67) (his emphasis again). Hence, labour time, is not just a *quantitative* measure of value; its expenditure is of intrinsically *qualitative* import. Consequently, an interrogation of labour time needs to focus on social relations in the capitalist production process.

By applying Wright's schema (1981), I present evidence that shows the direct relation between labour time and social relations of class struggle both in and of production as constitutive of the alienated *social form* emanating from value creation in production.

Sweezy, Dobb and Meek, on the other hand, according to Elson (1979), *identify* value with labour time. Devine later similarly explicitly identifies value with 'socially necessary abstract labour time or *snalt*' (1989:113). Devine suggests that by such a construal of value, the attempt at 'understanding capitalism as a social system' can be undertaken (1989:115). I only explore the first of the five main questions Devine lists, namely the question 'Where do profits come from? (exploitation)'. Bonefeld essentially follows suit in terms of following Marx's 'familiar definition' (2010:268) of socially necessary labour time. For Elson this identification limits the construal of value to the production process, thereby disabling any accurate postulation of the relation between the value and exchange value (i.e. prices) of commodities. This is the nub of the question in the transformation debate, long understood in a narrow quantitative fashion: are value and prices two different realms, or do value and exchange value (expressed as price) constitute two 'moments' of the same phenomenon? Disaggregating labour time, both conceptually and empirically, and examining precisely where and when surplus value is created in the labour process seems a fruitful avenue to pursue in this regard - notably in the unique context where the sale of the 'money commodity' gold was *guaranteed* and its price on the market was, until relatively recently, *fixed*.

What is crucial is that neither of these two perspectives - regarding the magnitude of value as issuing in *social form* and the *identification* of labour time and value - sheds light on the *genesis* of value, which resides in workers' value-producing direct labour time in production. There is empirical evidence to be adduced to clarify the perspective I am trying to develop, which reveals why labour time was and is so important in South African gold and platinum mining. Theoretical constructs must be fructified and tested by showing how they take root in reality - i.e within socially and historically identifiable events, contexts and processes. It is not clear to me that this particular synthesis has previously been exemplified, i.e. where an empirical and historical analysis, informed by a value-theoretic approach, enables the emergence of explanatory insight into the role of labour time in its value-producing capacity, and how social relations and social forms of organisation issue from the socially determined *quantitative* measure of labour time representing value in production.

The *quantitative* measure of value relates to the specific object under review: the total magnitude of labour time expenditure in the gold mines in South Africa since its inception. The significance of the (socially determined) *magnitude of value* assumed priority early in what Neilson implies was the 'first generation' of the labour process theory debate (2007:90). Eldred and Hanlon (1981) were shortly to put forward an analysis ostensibly going beyond Marx. The concern of these writers was to reconstruct the relation between value and the magnitude of value to enable the consistent linking of the magnitude of value to the value-form, more particularly the price-form. They aimed thereby to tie labour time more firmly to prices (and hence money),[45] thus tightening the internal conceptual linkages of the labour theory of value. In line with a general critique of Ricardian interpretations of value being understood as 'embodied labour' - as opposed to 'abstract labour' (both interpretations evident in the exegesis of Marx's texts in the next section) - Eldred and Hanlon argued that 'the concept of socially necessary labour does not arise with the analysis of value and magnitude of value but … with the treatment of relative surplus production' (1981:25).

This is an important, if perhaps controversial point given their 'circulationist' account of value theory. However, by my lights, Eldred and Hanlon (1981) are correct to point back to production[46] by suggesting that value, as measured by socially necessary (abstract) labour time, arises in the context of the extraction of surplus value in production. (Their analytical modelling I hold, without further argument, draws Marx's distinction between absolute and relative surplus value too sharply). While socially necessary labour time is most markedly impacted by improvements in technology, it remains influenced by the

[45] The issue of money as a store of value with which commodities as economic values are bound by an 'inner' conceptual link is not addressed in this thesis, not only for reasons of scope, but partly because the commodity being produced is the 'money-commodity' gold (see Eldred and Hanlon 1981).

[46] I do, however, resist the general 'circulationist' thrust of their argument, but cannot engage the range of issues in the debate with more 'production-centred' positions such as being articulated here.

intensity of workers' efforts as they find themselves constrained by 'the social organisation of production' which we have seen to be one of six factors noted by Marx.

The point is that when the group of mineworkers under review in this thesis increase the *intensity* or *pace* or *rate* at which they work or how they *apply* themselves at work - or beg for better equipment and machinery to increase the intensity of work - generally to win the all-important production bonus without which they increasingly cannot make ends meet, has become a critical part of mineworkers' wages and hence represents a portion of the costs of their reproduction.[47] Workers are consequently prepared to work longer hours to complete the 'task' of the support, drill and blast cycle in the mining labour process.

Capitalists have always focused on the aspect of work intensity in extracting surplus value and decreasing socially necessary labour time. What follows shows that workers currently work more intensively in order to win *leisure* time - as noted, the opposite side of the same temporal coin (see Stewart 2010). When the concept of labour time is disaggregated and subjected to a value-theoretic analysis, simply put, the difference between being *at work, actually working* and *intensifying work effort* is of quantum proportions when it comes to how production relations and forms of class struggle correspond to its different value components. The difference is magnified where the labour process is not a largely individualised affair as in an engineering workshop or a foundry, but is much more of a collective effort as in mining. This is of social and political import.

To press the point, when workers consciously and collectively work harder as in the instances to be related - to win a five day week (Chapters seven and eight) or tactically retreat from their oppositional struggles to win back lost wages and labour time (Chapter nine) - this alters the social attitudes and relations on a mine shaft generally, but

[47] Even more precisely, as will be seen, in Wright's terms, the bonus straddles the temporal components of 'physiological minimum necessary labour' and 'socially average necessary labour' and is reflected in the struggle of workers to move from 'struggles over physical survival' to 'struggles over social standards of living' (see Chapter six).

especially social relations in production by virtue of the control they exercise over it. They create additional surplus value, thereby paradoxically increasing the rate of their own exploitation by virtue of engaging in changing the relation between necessary and surplus labour time. In the process, however, workers will be shown to reassert the sense of their own organic collective power, albeit at a local level and certainly bereft of any external assistance. New attitudes emerged on the mine shaft where this took place, challenging established class-based racialised social forms of exploitation. Such social relations potentially assume causal capacity in social change - by virtue of changes in the magnitude of value created, measured by socially necessary labour time.

3.8 Socially necessary labour time as the measure of *value*

> *The law of value states that value, understood as the labour time socially necessary to produce a commodity, is conserved in the exchange of commodities.* (Cockshott & Cottrell 1997:545)

A few pages into *Capital* volume I, after distinguishing between the dual aspects of the commodity in terms of 'use value' and 'exchange value' and even prior to the introduction of the concept of labour-power, Marx explains plainly that 'a use-value, or useful article … has value only because human labour in the abstract has been embodied or materialised in it' (Marx 1977:46). In the next sentence, he asks how this value is to be measured and immediately responds by referring to 'the quantity of the value-creating substance, labour, contained in the article' (Marx 1977:46). Whether labour is conceived as 'embodied' or 'abstract' or whether the 'abstract labour' interpretation of Marx's value theory belongs to the 'technological' or 'social' paradigms (see de Vroey 1982; de Angelis 1995) or whether abstract labour is defined physiologically or in term of a social-form analysis (Bonefeld 2010), the initial focus must surely be the *duration* of labour time: 'The quantity of labour is measured by its *duration*, and labour-time in its turn finds its standard in weeks, days and hours' (Marx 1977:46) (my emphasis). This oft quoted measure is the 'average labour-power of society' or more precisely, seeing it also includes the other crucial aspect, namely the *intensity* of labour: 'The labour time socially necessary is that required to produce an article under the normal conditions of production, and with the average degree of skill and *intensity prevalent at the time*' (Marx 1977:47)

(my emphasis) or, differently translated, '… *in the here and now*' (Smith 1994:119) (his emphasis). Value is consequently determined by the 'amount of labour time *necessary at a given moment*' (Marx 1977:135) (my emphasis), even if it 'can only be established *post festum* (Bonefeld 2010:268-9).

At first blush, then, the value of commodities stands, for Marx, in direct relationship to the quantity of labour time expended in its production. Socially necessary labour time, however, is subject to six sets of factors impacting on the relative productivity of labour, Marx's fuller account specifying: '… amongst others, by the average amount of skill of the workmen, the state of science, and the degree of its practical application, the social organisation of production, the extent and capabilities of the means of production and by physical conditions' (Marx 1977:47). Given this range of explicitly social and technical factors and the actual contextual conditions within which production takes place, and given that socially necessary labour time is only amenable to quantification at specific moments (if at all) and is hence *averaged,* it is small wonder that some theorists concur with the assertion that '…it is not clear to what exactly "socially necessary labour time" refers' (Arthur 2001:32). That 'socially necessary labour' is a concept that is 'unclear' and in need of 'unambiguous definition' had been noted before (Facarello 1998:29).

Socially necessary labour time has consequently the dubious distinction of being defined by reference to a series of factors, including framing contextual conditions. The quantity of labour is 'limited' by these conditions; and that to which its application gives rise, i.e. *value*, measured by socially necessary labour time, is subject to 'the then existing social conditions' (Marx 1977: 203). Hence, to repeat, 'What determines value is not the amount of labour time incorporated in products, but rather the amount of labour time necessary at a given moment' (Marx 1973:135). As such, socially necessary labour time constantly changes and thereby constitutes a shifting average in its role as a measure of value, it having previously been usefully noted that '…the use of time as a measure varies historically' (Fine 1975:65). Or, speaking both more simply and generally, as it has very recently been expressed: 'Labour time as the measure of the magnitude of value is not fixed and given' (Bonefeld 2010:268).

Marx further elaborates on the 'fluctuating' character of socially necessary labour time by referring to the value of a product being determined by labour time in the context of competition (Marx 1973:59). In addition, under conditions of competition, in other words under capitalism in the widest and most general sense, '… labour time serving as the measure of marketable value becomes in this way the law of the continual *depreciation* of labour' (Marx 1978:59) (his emphasis). Not only this, Marx goes further and I quote him *verbatim* yet again, for the sake of clarity: 'It is important to emphasise the point that what determines value is not the time taken to produce a thing, but the *minimum* time it could possibly be produced in, and this minimum is ascertained by competition' (Marx 1978:60) (his emphasis).

Furthermore, as Marx puts it in his caricature of Proudhon, who had a reasonably coherent labour theory of value similar to that of Bray,[48] '… it is the fluctuating movement alone that in societies founded on individual exchanges makes labour time the measure of value' (Marx 1973:59). An established standard text sums up this brief discussion thus far, in that socially necessary labour time is defined as 'a concept concerned with the quantitative measure of value' determined by both 'some sort of *averaging* process in the market' and 'the individual labour time of the most efficient firm' (Bottomore 1983: 448) (his emphasis).

Regarding work paid by the piece or piece rates or what Marx refers to as piece-wages, a social average, Marx argued, *can* constitute an 'exact measure for the intensity of labour': due to it being determined and enforced by the capitalist as piece-wages paid according to both the *quality of the product* and the *time taken to produce it*, which, Marx avers, can be 'determined beforehand and experimentally fixed' (Marx 1977:518). But this is a *social determination*, for in such contexts, 'a contest arises between master and labourer whether a particular piece of work is one hour, or so on, until here also *experience* decides' (Marx 1977:518) (my emphasis). For Marx, piece-wages are 'most in harmony with the capitalist mode of production' (Marx 1977:521). Yet while piece-wages or piece rates facilitate the greatest range of differences in individual wages and even 'a sense of liberty,

[48] I am indebted to Lucien van der Walt for this insight.

independence and self-control of the labourers', competition accompanies this form of wage labour and forces the lowering of the average wage or socially necessary labour time (Marx 1977:520).

Where, however, tradition based on experience over time has stubbornly defined both product quality and labour time, Marx notes that 'the masters, in … exceptional cases' had to resort to time wages - not without having to face striking workforces defending long-held working traditions (Marx 1977:520). The motivation of this action of the 'masters' was clearly to assert greater control over labour time from which greater surplus could be extracted, as opposed to setting wages for specific commodities, which are not readily manipulated once agreement is struck in the context of strong working class traditions defining 'a fair day's work'.

Physical and social conditions and contestation, then, clearly underpin the temporally determined measure of value, socially necessary labour time. The current theoretical debate has still not entirely adequately defined this key temporal concept, attempts at defining it resulting in 'socially necessary abstract labour time or *snalt*' (Devine 1989:113) or *'privately performed (socially necessary) abstract labour'* (Kicillof & Starosta 2011:299) (their emphasis), the latter definition being thought by Bonefeld (2011:477-8) to be a fetishised version of Marx's original formulation - i.e socially necessary labour time *simplicter*, but which we have seen to be subject to determination by six factors, each of which is complex. In brief, the very concepts of abstract labour and labour time now appear now to be somewhat confused. Such is the state of the most current debate. Labour time, however, is now dramatically poised at the centre of the stage.

Yet what it seems is required (as far as I have tried to understand these things), is further investigation in Marx scholarship around the issue, that, while labour time in general serves as the measure of value and socially necessary labour time serves as the ever shifting average, this measure is one that, Marx curiously notes, 'exists only as an ideal, it cannot serve as the matter of price-evaluations' (Marx 1973:140ff) which threatens to

take us back to the transformation problem. But neither the intellectual labour time, nor the requisite philosophic skill, is available to this thesis candidate to pursue this airy conceptual domain.

All I can say is that it is only in the ideological *practice* of those who command the capitalist labour process, and where, in following neo-classical economics that all available time should ideally be utilised for the running of the production process, as the South African mining industry will be seen to prefer, that the measure of labour time has an ideal maximum - thereby 'ideally' eliminating historically unavailable surplus labour. The duration of the expenditure of labour time, as the measure of value under capitalism, is consequently embedded in the social relations under specific material conditions within which its actual determination is manifested as an average wage.

It is not surprising, then, that in the very early days of mining, capital 'tests' the value of labour-power by manipulating wages (Legassick 1975) - i.e. decreasing the necessary component in order to expand surplus labour within the working time regime. When this fails - because workers desert when wages no longer meet even the most basic needs for their reproduction - as will be seen, wages are increased or the length of the labour contract is temporarily reduced to induce them back to work. Under normal operating conditions in mining, marked by a stable labour time regime, the push to use the full spectrum of available time continues, for this potentially eliminates historically unavailable surplus labour time and potentially drastically reduces the socially necessary labour time of the working class as a whole. But for value to be measured at all, *actual* work must nevertheless be performed.

3.9 Direct labour time as constitutive of value

> *If the society as a whole is to be grasped in motion, in process, it is first and foremost essential to comprehend the dynamics of the direct production process…*
> Martin Nicolaus (foreword to Marx's *Grundrisse* 1973:31)

The *determining* role of direct labour time in both economic wealth and value creation is clearly stated in Marx's writings:

> The exchange of living labour for objectified labour - i.e. the positing of social labour in the form of the contradiction of capital and wage labour - is the ultimate development of the value relation and of production resting in value. Its presupposition is - and remains - *the mass of direct labour time*, the quantity of labour employed, as the determinant factor in the production of wealth (Marx 1977:704) (my emphasis).

Direct labour time, as the 'presupposition' of the creation of value and real, material wealth, has further been construed as a 'fundamental structuring category' of our contemporary globalised capitalist economy (Postone 1993:20). Moishe Postone's exegesis of the above passage from Marx's *Grundrisse* explicitly states that value should not be understood 'merely as a category of the mode of distribution of commodities'. Rather, it should be understood as a 'category of capitalist production itself' (Postone 1993:24). Controversially, leaning strongly on the *Grundrisse*, Postone (see 1993:21-29), in his interrogation of the generally accepted Marxist view on the contradiction between the forces and relations of production, goes further and surmises that:

> It seems, then, that the Marxian notion of a contradiction between the forces and relations of production must be reinterpreted as referring to differentiable moments of the production process. 'Production resting on value' and 'the mode of production founded on wage labour' seem closely related (1993:24).

I want to go on and show how social relations in production are framed - and indeed 'fettered' - by technological conditions such as the 'primitive' (but still necessary) productive 'force' of the hand-held rock drill in particular. More broadly than struggles over the labour process, value creation within the working day, when analysed in terms of Wright's schema, gives rise to and perpetuates alienated forms of social intercourse and organisation which have their basis in production. I attempt to give substance to the assertion that: 'Value is a social form that expresses, and is based on, the expenditure of direct labour time. This form, for Marx, is at the very heart of capitalist society' (Postone 1993:25). I should immediately note that I cannot see why this claim relies on an

'embodied labour theory of value' as has been supposed (Albritton 2004: 80). It is also certainly not to argue, as Brown correctly points out, that '...value form is prior to, or supersedes, abstract labour as the substance and measure of value' (Brown 2008:143). On the contrary, it is rather the *genesis* of value which gives rise to social form: at least this is what I want to show.

For it is within the labour process that labour time, whether direct (time spent actually working) or not (time spent *at* work, but not actually working) (see Chapter six), is applied and wherein value is created. I *am* largely in agreement with Postone when he writes as follows:

> Direct human labour in production, according to Marx, becomes the actual, if covert "raw material" of the process of creating value. Yet because the process is, at the same time, a labour process, labour may continue to seem to be the purposive action that transforms matter in order to satisfy human needs. Its real significance in terms of creating value, however, is its role as the source of value (1993:281).

More importantly for my purposes, it is precisely the 'differentiable moments of the production process', in the mining labour process particularly, which I interpret Wright's schema as identifying, which require analysis, whether such 'moments' are informed by a revolutionary working class politics intended to challenge capital or are 'ordinary' daily struggles.

Whatever the case in specific instances, in order fully to appreciate the structuring and foundational role of labour time in shaping social relations in a given historical context and not to see time simply as a quantitative measure of the expenditure of labour-power, Postone argues that it is not merely value, but in addition, its measure, that needs to be treated *qualitatively* and not treated simply *quantitatively* (Postone 1993:186). Carol Gould similarly previously argued that of Marx 'it might be said that for him time is itself qualitatively different at different stages of social development' (1978:64). Consequently, what will attract attention is Postone's insight, how value and labour time as its magnitude - as a 'fundamentally structuring category'- not just shapes production under capitalism,

but shapes both the social relations within it, as well as broader socio-political sets of social relations *qua* social form. I propose to exemplify the following reasoning Postone advances, but apply it neither generally nor abstractly, but specifically and concretely to the time workers spend labouring:

> Marx's statement that in capitalism 'direct[51] labour time (is the) decisive factor in the production of wealth' (1973:704), suggests that his category of value should be examined as a form of wealth whose specificity is related to its temporal determination. An adequate reinterpretation of value must demonstrate the significance of the temporal determination of value for Marx's critique and for the question of the historical dynamic of capitalism (1993:123).

Following Marx, *value* had already been directly equated with socially necessary labour time in order to understand capitalism as a social system (Rubin 1972). Socially necessary labour time, moreover, has explicitly been construed as abstract (Devine 1989:113). This should not imply it is not measurable (Cockshott & Cottrell 1997). Postone, however, further conceptualises the role of the *measure* of value as abstract by tracing the historical emergence of what he refers to as abstract time; time which is 'uniform, continuous, homogenous, "empty" time' which is 'independent of events' (1993:202). 'The result', he argues, 'is a new, increasingly abstract form of domination - one that subjects *people* to impersonal structural imperatives and constraints' (1993:4) in advanced capitalist societies characterised by relative surplus value extraction in particular (my emphasis). Postone more specifically suggests that while direct labour time is the pre-eminent quantitative and qualitative measure of value, this needs to be shown. Yet as a critic pointed out: '... despite his highly insightful discussion of abstract time, Postone neglects its articulation with concrete time, with the lived time of finite, embodied humans' (McNally 2004:203).

I move firmly in the direction of 'concrete time', the experience of lived-time in other, simpler words, via employing Wright's value-theoretic decomposition of the working day, with specific reference to the labour time of a fraction of the *working class.* Wright's

[51] 'Direct' labour time' is what Wright refers to as '*actual*' work (see Chapter six).

schema sheds light on the social relations and formations attending labour time expenditure, thereby instantiating the crucial importance of the *actual* (direct) labour time of workers, which is responsible for net surplus value constituting the *genesis* of value in production itself.

3.10 A value-theoretical decomposition of the working day

> *The time of class struggle entails a different conception of time to that which holds that time is money.*
> Werner Bonefeld (2004:115)

Eric Olin Wright goes well beyond Marx's distinction between absolute and relative forms of surplus value extraction by dividing the length of the working day into its analytic value-theoretic categories, its temporal and value components and corresponding forms of class struggle (Wright 1981:36-47). Wright's decomposition enables the employment of a considerably more nuanced series of distinctions as to how value is created in terms of socially necessary and surplus labour, and hence *actual* value creation - as well as identifying the category of *historically unavailable surplus labour*, which is beyond the reach of capitalist exploitation.

By applying Wright's (1981) decomposition of the working day into its value components, the source of value is illuminated. The working day divides into its various value-creating and non-value-creating moments, and these are clearly linked to specific forms of class struggle. Centred around a disaggregated concept of labour time, located in the labour process and standing in direct relation to class struggle, this schema, when applied and tested in and against a specific conjunctural context, potentially enables the emergence and development of an agent-sensitive social analysis capable of theoretically integrating the key concepts that constitute it. Applied to the same context over real historical time, the following chapters will reveal the social necessity of a stable, long-hour work time regime required for capital accumulation to take place in ultra-deep mining. It will further reveal the qualitative, social effects of the quantitative expenditure of labour time, which directly results in the emergence of intra-working class

occupational social groups, the entrenching of structures of class formation and the maintenance of a racialised composition of class. At the very least, this raises the prospect of examining anew the process of class formation, and potentially contributes to integrating the labour process theory debate of almost a generation ago with the political analysis of social class, a topic again on the agenda (Neilson 2007).

3.9 Conclusion

> …then, on the one hand, necessary labour time will be measured by the needs of the social individual; and, on the other, society's productive power will develop so rapidly that, although production will now be calculated to provide wealth for all, the *disposable time* of all will increase…Then wealth is no longer measured by labour time but by *disposable time*.
> Marx *Grundrisse* (1977:598) (his emphases)

This chapter has sought to examine the value of labour time and thereby defend the labour theory of value by traversing an old, well-scoured yet still bumpily uneven field. It has borne traipsing (and tripping) over again as Marx's value theory remains a topic of debate. Leaning on old debates in Marxist value theory, I have construed socially necessary labour time as more than simply the fluctuating measure of value, but as an eminently materially inscribed social form founded on technical and social factors framed by objective material conditions. Value is consequently understood to be born of the direct expenditure of labour and time in production under capitalism. Empirically verifiable, both specific historical and contemporary sets of social relations and social forms of organisation, in concrete conjunctures, are then accounted for by assuming Wright's value-theoretical perspective, which disaggregates the concept of labour time. This analysis reveals the genesis and something of the 'specificity of value-producing labour' once his decomposition of the working day is critically applied to the mining labour process underground. Such an analysis must, however, be located in its historical context.

Using a technology reminiscent of an earlier industrial age, dominated by both relatively *intensive* and *extensive* absolute forms of surplus value extraction, the African mining proletariat consequently, in many ways, will be seen to both mirror an earlier industrial age and produce absolute surplus value consonant with such earlier ages as occurred in the development of advanced capitalism. This proletariat has yet to graduate to 'superintending' the production process, but rather still directly employs 'brain, muscle and nerves', as Marx put it, at the point of production at the rock-face.

In mining, socially necessary labour time (taking Marx's definition as literally as possible) is consequently a relatively significant component of total labour time expenditure. Direct labour costs generally run at over 50% in platinum mining and more in gold mining. This is considerably high for any profit-seeking enterprises under capitalism, let alone in a historically cost-sensitive industry such as South African mining in current global economic conditions. This has resulted, it will be seen, in how a particular occupational group, under specific social and historical conditions, stands out in stark relief as a visibly recognisable collective working class echelon, and is acknowledged as such by their peers, as well as from across the class divide. These workers deploy a particular, experientially, time-worn tacit 'average' skill that can be quantified by measuring face advance. Implicating a number of Marx's six factors impacting on socially necessary labour time, the rock drill operators are physically located in an exceptionally advanced engineering scientific environment in the deepest mines in the world. The extent of this environment stands in stark contrast to their hand-held rock drill. They work in a still largely racialised, yet fairly autonomous social organisation of production. This organisation defines the primitive extent to which their potential capabilities are constrained within the series of means of production technically available to them.

It will also be seen that, especially for rock-drill operators, the echelon in question, the working day further remains as long as it was in 1911; for sub-contracted workers in general, it is even longer. The original source of capital accumulation in South African mining was virtually entirely dependent on this *extensive* duration of the expenditure of

their labour time. Mining work has in addition become more intensive. Simply expressed, the wealth produced via the profitable deployment of capital in the contemporary, capital-intensive South African mining industry continues to rely heavily at its productive heart on massive tranches of the expenditure of human labour-power measured in hours and long working days, using a hand-held, compressed-air-powered and water-cooled percussive rock drill.

The historic reliance of South African mining capital on the rock drill and the temporal configurations of industrial working time (in hours, days of the week and paid leave) and the length of the labour contract (in weeks, months and years), have been the chief mechanisms ensuring the *retention* of labour power at the point of production. It will be shown, and, indeed, proven practically in Chapter nine, that this is not in doubt.

The stability of industrial working time and the increasing length of the labour contract, both covering the span of almost a century, engendered forms of social organisation that were in turn entrenched by lengthy spells of labour time expenditure at the levels of both the individual worker and the industry itself. Labour time could not be cut back where technological development had stalled; hence the social necessity of the stability and the long working hours of its labour time regime, the evidence for which is presented in the following two chapters.

4 Hours and the working week

4.1 The contours of working time in South African mining

> *After thinking it over, I am strongly opposed against stopping night hauling unless you can haul during the day as much as you wish.*
>
> Cecil John Rhodes - opposing the discontinuation of round-the-clock operations on the diamond mines in 1894 (Rotberg 1988:497)

Since 1911, whether it was the matter of working hours being the trigger to the 1913 Miners' Strike, the implementation of an actual 48 hour working week somewhere between 1917 and 1919, the white Mine Workers' Union's struggle from the late 1940s through to the mid-1970s, the compromise arrangement in working time thrashed out in negotiation between the Chamber of Mines and National Union of Mineworkers (NUM) in the early 1990s, or on the platinum mines[52] in a series of little-publicised strikes of a cluster of unions in the early 2000s, working time has remained extraordinarily stable for around a hundred years.

The issues raised by organised labour retain a remarkable synchronicity. Sunday work is an issue at the beginning of the period and is one at present. The arguments of the trade unionists in the 1970s for a five day working week echo those made in the 2000s. The arguments of the Chamber of Mines, who lead the defence of maintaining the *status quo* regarding working hours on behalf of the gold and other mines, do not change in any qualitatively meaningful sense except at three critical points. After more than a century, working time in mining appears to have come full circle under very different social and economic conditions: the initial short contracts of two to four months in the early years of diamond mining are akin to the 'limited duration' contracts in the contemporary period of increasing numbers of sub-contracted mineworkers (Buhlungu & Bezuidenhout 2008).

[52] To be recorded in Chapter nine.

The secondary literature does not enable a precise reconstruction of working hours and the shape of the working week in the early years after the discovery of gold in the Transvaal. The Chamber of Mines first standardised working hours and rations for African labourers across the Witwatersrand gold mines in 1896. This was the first attempt to *retain* labour in the on-going struggle to acquire a regular supply of labour in the absence of both the political will and the required facilitating administrative labour control mechanisms of the agrarian State of President Paul Kruger (Marks and Rathbone 1982). The number of hours then worked on the mines is not recorded, but may have been the nine and a half hours the Chamber officially reported in 1903. This was the working time men were required to spend underground at the rock face. The working day was longer than this, as the time spent travelling to and from the site where work occurs generally adds significantly to the length of the working day.

Kruger's *Volksraad* passed legislation for an eight hour working day in 1899, its implementation interrupted by the South African War. The demand for an eight hour day is repeated in 1904 (Katz 1976:183). A decade later, a 48 hour working week was introduced in 1911 in the Mines and Works Act, but only took effect somewhat later. The demand for a 40 hour working week is thereafter repeatedly presented as the demand for a five-day work week, made by the Mine Workers' Union (MWU) from 1947 through to 1976 when the matter culminates in a fully-fledged industrial dispute. The shape of the working week - but not the number of hours - then changes, as a result of the two reports of the Franzsen Commission of 1977 and 1978, to the compromise eleven shift fortnight[53] (ESF) working time arrangement. The 48 hour working week, legislatively enshrined in 1911, was successfully defended by successive mine managements until 1989 (Lewis 2001) and effectively continues on some mines into the present.

Reduced hours again becomes an issue in the early 1990s when the NUM, negotiating from a position of weakness after a major strike of black workers in 1987 resulted in

[53] In the ESF, 96 hours are often averaged over two weeks, permitting the individual employee every second Saturday off. The averaging of hours can occur over four months.

massive job losses and under conditions of a dramatic fall in the gold price, agreed to a series of experimental working time arrangements, including full calendar continuous operations (Fulco) (Bezuidenhout 1999). In the late 1990s, the 45 hour week is introduced as a national standard via the Basic Conditions of Employment Act of 1997 (BCEA). Subject to negotiations with trade unions, however, within the mining industry, the full hour for lunch is hardly ever taken. Half an hour instead is often added to the six shifts a week, (during which workers can informally 'rest' while underground) bringing time spent underground often back to 48 hours a week, thereby effectively maintaining the length of the working week.

The point here is to track working hours in some detail, not to suggest that mineworkers worked longer hours than either domestic or agricultural workers, which they almost certainly, *sans* evidence, did not. It is rather to show that the stability of working hours is the marker for the importance of the expenditure of labour time. This needs to be set alongside the cheap labour thesis to account more fully for the exploitation of mine labour. To this end, industrial working time, as it relates in particular to gold mining in South Africa, has been characterised as follows: The early years: 1886-1910; the years of stability: 1911-1990; and the years of change: 1991 to 2006 and through to the present.

4.2 The early years: 1886-1910

An Apprenticeship Contract, dating from 1790, born of the slave era,[54] yet to be importantly distinguished from it[55] and used as a basis for the contracts of apprentices in

[54] Quoting work on slavery at the Cape and how the apprenticeship system was instituted to avoid the 'perils of emancipation' Allen writes: 'the masters were allowed to claim the whole time of their Apprentices' (Allen 1991:103).

[55] Quoting Hegel's *Philosophy of Right*, Marx notes that legislation specifying the maximum length of labour contracts occurred in order to establish the status of free labour in contrast to that of the slave or *peonage* - the repayment of debt by labour - which amounted to the same thing. The contract was expressly to be of a limited duration, for otherwise, as Hegel put it, by '… the alienation of all my labour time and the whole of my work, I should be converting the substance itself, in other words, my general activity and reality, my person, into the property of another' (Marx 1977:165, footnote 2).

the South African artisan unions, illustrates the conception of working time to which slaves, servants and in this case apprentices, were required to adhere. The central aspect of the contract, distinguishing it from the common practice of indentured labour, disciplined the young apprentice's time for a period of seven years. Quite apart from a stringent set of restrictions and prohibitions, he was:

> … not to absent himself from his said Master's service and business at any time by day or night without their leave asked and obtained for that effect (Walker & Weinbren 1961:368-9).

Absence from work without leave constituted desertion. This prompted, for instance, a series of short strikes of the early typographical societies and associations in the Cape in support of men facing prosecution for not adhering to time as stipulated in their contract. There is evidence of unions raising strike funds to defend members (Walker & Weinbren 1961:3). In one such incident in 1889, the offenders were convicted of desertion over their absence, but won their demand for increased wages. This early outcome was to set the tone of struggles over working time elsewhere and may well prove applicable more widely than it was in the mining industry for over a century: it would prove easier to win wage increases than a reduction in working hours.

Also of particular pertinence for this thesis is that, regarding African labourers, in 1890 the recently formed Chamber of Mines advised its members 'to institute a working month of twenty-eight days, divided into twenty ten-hour shifts and four Saturday shifts of roughly seven hours' (Harries 1994:110). This appears to be a 74 hour working week on this account. Furthermore, the relevance of which will become clear: 'By allowing the [African] drill men to control *the pace at which they worked and the length of their shift*, the management of Simmer and Jack succeeded in attracting large numbers of skilled workers (Harries 1994:132).

The formally skilled miners, all Europeans at the time, mostly worked a contract of a month, concluded verbally with the mine manager and based on a specified production

target (Katz 1995:483). Initiated in the 1890s, these European immigrants were subject to the miner-contractor system which was made virtually compulsory in the 1900s (see Katz 1995:484-5). The underground contract system was investigated by the Transvaal Chamber of Mines in the wake of the 1913 General Strike. While the Chamber claimed they had abolished the 'flat contract' system in 1915, this appears to have continued sufficiently widely to have surfaced as a 'very important issue' in the 1922 strike (Yudelman 1983: 105).

In September of 1889, skilled artisan members of the Amalgamated Society of Engineers (ASE) struck to demand both increased wages and the reduction of working hours from 54 to 48 a week. In this virtually lone case encountered, men *did* achieve a reduction in working time, the compromise of 52 ½ hours a week being reached after some negotiation (Walker & Weinbren 1961:4). Interestingly, at the time a survey - almost certainly the first survey on working time in South Africa, 'made for' the ASE by a T. Kneebone - showed that the working hours for these skilled artisans on 108 Witwatersrand gold mines were 56 hours a week (Walker & Weinbren 1961:4). Working hours were clearly a sufficiently serious concern for the ASE to have commissioned this surprisingly early 1889 study.

Three years later in 1892, 'excessive hours' was cited as a grievance at a public meeting on Johannesburg's Market Square. This complaint was registered by one J Sneddon, the first secretary of the first general union, the Witwatersrand Employees' and Mechanics' Union,[56] shortly after its formation. A prominent trade unionist, who was later to articulate the demand for a 'bank-to-bank' eight hour day in the 1913 General Strike, JT Bain, was one of the union's founding members (Simons & Simons 1969:53).

On the gold mines, during these fractious early decades of the South African gold mining industry, a three-shift system was in place and Sunday was a normal working day (Katz

[56] Davies (1979:114) gives the date of the 'founding of the first (presumably industrial) union' as 1881, but does not provide either the name of the union or a clarifying reference.

1976: 328). Miners initially worked regular industrial working hours. In 1894 bonuses were offered as incentives, but this turned out to be more expensive than the generally verbally concluded contract. It is yet to be established whether this was the reason the industry took on Afrikaner workers for the first time in 1897, reportedly as an '*armmoedeverligtingskema*'[57] These men numbered '*'n paar honderd werklose en ongeskoolde Afrikaners*'[58] (Visser 2008:13). By 1899 already, however, bonuses had been phased out and over half of the miners were working contracts.

The potential value of the labour-power of this embryo of the Afrikaner working class on the gold mines was clearly recognised as Rand Mines Ltd, a few years later, employed 445 unskilled whites, 60% of whom were Afrikaners, on what it seems was then the traditional monthly contract (Visser 2008:13). By 1906, Visser reports, 1 700 of the 5 703 white workers on the gold mines were Afrikaners, quite aside from at least a further 500 unskilled 'cocopan supervisors'. These barely time-tested men were to break the craftsmen's strike the very next year in 1907.

By 1907 most miners worked under contract (Katz 1994:82). These contracts were short, generally, it seems, of a month's duration, but with miners on 24-hour notice if targets were not reached. This encouraged unsafe mining practices, requiring 'speeding up', thereby increasing the risk of contracting silicosis and hastening premature deaths (Katz 1994:84-6). Some miners prospered. Most did not, with many contractors having to put in additional overtime, including working illegally on Sunday (Katz 1994:86).

The Sunday Law of Paul Kruger's Republican Government, with a weak mining inspectorate being ignored, was infringed with impunity (Katz 1994:98). Sunday work was a 'burning question' as early as 1894 (Katz 1994:89). Workers were being compelled to work on Sundays in 1901, and in 1902 artisans had overtime rates abolished and

[57] Poverty alleviation scheme.

[58] A few hundred unemployed and unskilled Afrikaners.

piecework was 'summarily introduced' (Katz 1994:103). Miners were caught in a double-bind over Sunday work. Elaine Katz notes a magistrate confirming that:

> Under the existing (Sunday) law the miners suffer a hardship, inasmuch as if they did not work they would be discharged, and if they did work they were prosecuted (Katz 1994:89).

It is likely that only shaft sinkers, working three continuous eight hour shifts on the Free State gold-fields in the 1950s, would continue this pattern, their working hours adding to the mystique attached to this occupation (Guy and Thabane 1988:263).[59] Though Sunday work would be proscribed by the 1911 Mines and Works Act, it would take some time to be fully implemented, and as late as 1943, the African Mine Workers' Union (AMWU) reported that had new recruits understood the labour contract foisted on them, '…many would not [have] agree[d] to do Sunday work' (Allen 1991:431). In addition to the need for time off from the rigours of mining, Sunday at the time was crucial for trade union organisation (Moodie 1986:30-31).

It is not clear when the Saturday half-holiday[60] was first introduced, for in September 1897 an attempt to abolish it resulted in strike action at the Crown Deep Mine. When management withdrew the notice of abolition, work was resumed (Walker & Weinbren 1961:9). In the same year, the mineowner JB Robinson precipitated a strike by reducing wages and extending working hours, despite an informal agreement not to alter workers'

[59] Guy and Thabane also note that the shaft sinkers, predominantly Basotho, were, in addition excluded from the 'maximum average system' (1988:267, footnote 18). The continuous three eight-hour working cycle of the shaft sinkers involved an unspecified period of time to break up the large rocks resulting from the blast, between four and 5 ½ hours lashing broken rock, half an hour to an hour preparing air hoses and the face, and an hour to 1½ hours to drill the vertical shot holes, at which point the machine-drill operators were removed from the ever deepening shaft and the shaft sinker and his assistant would then prepare for the next blast, themselves to then leave and be replaced by the next crew for the following round of the drill and blast cycle once the dust had cleared (1988:264).

[60] Whatever story is to be told in this regard, this half-day off on Saturday constitutes the historical roots of the Eleven Shift Fortnight compromise arrangement in 1978. It has deeper roots in Britain, going back at least to 1639 (Thompson 1967:72).

industrial conditions, which would 'incite open resistance' by white workers (Katz 1994:8). Of greater significance was the *Volksraad's* passing legislation two years later in 1899, initially requested by the Johannesburg Trades and Labour Council, to legalise the eight hour day; the outbreak of the South African war preventing it from taking effect (Walker & Weinbren 1961:9; Katz 1976:24). In practice, working hours among general (white) workers were in all likelihood longer than the official 56 hour working week of the skilled artisans cited in Kneebone's report to the ASE in 1889.[61]

At the turn of the century a twelve hour working day was most likely the norm on the Rand and de Beers mines (Lundall 1990:66). In 1901, however, the State mining engineer reported that African workers 'must work hard, about ten hours every day, mostly underground' (Callinicos 1980:17). African workers in 1902 generally started the working day between 3am and 4am when the compound manager himself (often accompanied by a dog) would 'turn out' the shift, while on larger mines this was the task of the compound police (van Onselen 1980:142).[62] Chinese indentured labourers, between 1904 and 1907, were also housed in compounds[63] and worked 60 hours a week. Uniquely for the time, these workers did not work on Sundays (Richardson 1982).

[61] For this early period the shape of the working week is also not clear, for if Sunday was a normal working day and men officially worked nine and a half hours as the Chamber claimed in 1903, this suggests a longer week than 56 hours. The limited information from the secondary literature consequently does not enable verification of the length of the working week or the reconstruction of its shape.

[62] In pre-Industrial Britain, EP Thompson reports, farmers would rouse their labourers '…and no doubt the knocker-up will have started with the earliest mills' (Thompson 1967:64).

[63] As Crush (1992:833) notes, over time 'compounds 'became 'hostels' and then 'mine villages'. He omits the appellation 'residences', which was initiated in the 1980s, but never quite took root. Having lived in and seen examples of all - except concrete bunks, some of which could still until recently be seen in and around the old ruins of mines around Germiston - I can vouch that the differences are real and not mere managerial rhetoric as Crush implies. Workers, however, consistently, call them the *kompong* - from the Malay word. Of the control mechanisms in the Joel Mine residence Crush refers to, a number had lapsed by 2000, the guards, turnstiles and bar-coded identification cards in particular.

In 1904, the SA Engine Drivers' Association, responsible for hoisting men underground, wanted its members' 12 hour shifts to be reduced to 10 hours. The acting government-mining commissioner, Horace Weldon, responded to the trade union deputation by saying: 'I do not agree that [their] twelve-hour shift is any hardship' (Katz 1976:51).

In the same year, unskilled Afrikaner workers were taken on for '*kort werkstermyne*',[64] deemed cheaper, Wessel Visser surmises, than paying for the considerably more expensive measures of installing the necessary ventilation to prevent miners' phthisis (Visser 2008:13). The context was the mass desertion of African workers after the South African War following a summary wage cut by the industry as it tested the value of labour power.

By the following year and in concert with demands of labour internationally at the time, other local trade unionists, under the sympathetic political umbrella of the Responsible Government Association, the Labour League of the Witwatersrand Trades and Labour Council had formulated a demand for an eight hour working day (Simons & Simons 1969:105). In 1906, when regulations, for the first time, restricted re-entry to a working place a half hour after blasting, Elaine Katz suggests two 10-hour shifts 'were customary' (1994:170). Whatever the precise length of the shift, from 1907, both formal and informal requests and appeals for 'a national system of holidays and additional public holidays' were made by organised white labour (Katz 1976:347). Given the focus on the length of the African labour contract (to be used in the next chapter as an index of reluctant proletarianisation) it is worth noting that Afrikaner workers in 1907, still not used to the rigours of unskilled manual work, particularly underground work, often did not last for a single month of continuous work (Katz 1995:477). However, a small number had served sufficient time underground to have been promoted to mine captain (Katz 1995:477). This differentiation between those who failed to become acculturated into mining work and those who were promoted, hinging on the time spent at work, prefigures a conclusion to

[64] Literally, 'short working terms' or periods. The actual length of these short-term contracts is not specified, but they may have been the regular monthly contracts.

this work. Labour time is the initial differentiator of occupational distinctions contributing to the formation of social classes within the mining community, irrespective of race.

White workers' requests for adequate holidays and time off were achieved only some years later in the wake of the 1913 general strike, and then only appear to have been selectively applied to working men of 'senior official' status (see Cartwright 1962:212). In the absence of more detailed historical scholarship, the conjecture that these calls were at least in part responsible for the establishment of the *Select Committee on the Subject Matter of the Eight Hours Bill* by the Transvaal Legislature in 1908 seems reasonable. At the time, 'an attempt' to institute an eight hour day was 'quashed by the mine owners'; this may refer to the interim Responsible Government's Select Committee (Lundall 1990:66).[65] Whatever the case, the Committee found that legislation to institute an eight hour working day was not required, as apart from mining and agriculture, such measures had been voluntarily adopted in private industry. Trade unionists disputed this. They argued instead that the 'reverse was true' (Katz 1976:332). For instance, printers at this time were sometimes working 15 to 16 hours a day (Katz 1976:333).

The call in these years for an eight hour day was of particular concern to all underground workers because of their susceptibility to miners' phthisis (Katz 1976:33). This occupational disease had increased as a result of machine rock drills[66] introduced just before the outbreak of the South African War in 1899. Already before this, in 1897, African workers, previously engaged solely in hand-drilling, unskilled lashing work underground and responsible for virtually (though not all) physical mine labour, were employed to assist with operating the drills, supervised by the de-skilled white craft miner (Katz 1976b). Miners' phthisis, however, only became manifest years later and was only positively linked to dust in the mines in 1907. Elaine Katz has shown the strong link between labour time expenditure and lung disease (1994). Of the black work-force, some

[65] Lundall confirms the view of Horner and Kooy (1980) 'that working hours on mines showed no real improvement' (1990:66).

[66] The 'Slogger' machine (see Cartwright 1962:149).

were what Katz calls 'the long-service Africans', with the drillers staying on the mines for 'five to seven years or longer'; these were the 'prime victims of silicosis' (1994:73).

Both the Mining Regulations Commission of 1910 and the Economic Commission of 1913 recommended a single shift a day to prevent workers going back underground before the dust had settled (Katz 1976:336). The actual situation regarding the shift system is again not clear at this point. The single shift system had apparently been instituted on 32 mines, the remaining 23 mines continuing with either a two- or three-shift system (Katz 1976:336). Three years later the three-shift system had not changed to a single shift a day. It is further not clear when the three-shift system again became generalised, as three shifts remains a current generalised arrangement in South African mining at this point prior to a major shift in regulating time spent at work.

4.3 Years of stability: 1911-1990

The 'invisibility' of time and the stability of industrial working time perhaps partly explains the absence of any sustained historical treatment in the secondary literature on the time spent labouring on the South African mines. Officially, from the Mines and Works Act of 1911 (though in practice only from around 1919) through to the implementation on some mines of continuous operations in the early 1990s, the number of working hours remain unchanged, with workers tied to the temporal regime of a 48 hour working week. In practice working hours were often considerably longer.

It should be noted that while the hours of work stipulated in the 1911 Act only changed with the BCEA in 1997, a dramatic drop in the gold price in 1990 signals an end to this period. For much of the 1990s the industry was plagued with a 'stagnant gold price, declining reserves and escalating costs' leading to 'major restructuring' (Crush *et al* 2001:7), not least of which was around working time arrangements. Singularly dramatic changes then occurred with the introduction of full calendar operations (Fulco) when wages were linked to productivity in negotiations between the NUM and the Chamber, changing the direction taken with regard to working time.

4.3.1 The Mines and Works Act of 1911

Michael O`Donovan suggests the Mines and Works Act of 1911 was 'unambiguously the product of class conflict between organised white labour and capital' (1985:44). If this is the case, the contested issues at the time were those that had dominated industrial relations for the previous two decades: 'Sunday work and the eight-hour day' (Yudelman 1983:89). The Act banned Sunday work, except for exemptions for essential services (Katz 1976:343), allowing for certain types of work (such as those associated with pumping and ventilating machinery) to be conducted on Sundays and public holidays. All existing and planned milling operations were permitted to continue running on Sundays; some of them, Yudelman argued in 1983, 'have continued to do so until this day' (1983:3). However, that the Act was immediately being infringed resulted in the promulgation of the Sunday Observance Commission of the same year. Miners and artisans considered that no work should be performed on Sunday, '…because it was the one day on which a workman and his family could see their friends or enjoy family life' (Katz 1976:343-344). The Sunday Observance Commission, however, was also widely ignored and Sunday continued to be a normal working day. 'Men were frightened to object for fear of losing their jobs' (Katz 1976:344).

It became a punishable offence to employ workers for more than eight hours 'at the face' (Katz 1976:335). This was an attempt to curtail the severity of miner's phthisis. The eight-hour day, as defined in the Act was, however, 'limited', being 'hedged with loopholes of which the employers could and did take advantage' (Yudelman 1983:88). That the Act was not enforced is shown by the role the demand for the eight-hour day assumed in the 1913 General Strike two years later. Men waiting to be hoisted continued to be exposed to 'an atmosphere thick with dust and nitrous fumes for periods varying from one to two hours' (Katz 1976:335).[67] For the miners, the time spent underground was 'literally a matter of life and death' (Hyslop 2004:201). In 1913, evidence suggests,

[67] See also Katz (1995:485) for mortality rates when these hours were the norm and prior to improvements in dust control.

workers were going down at 6am, with the ventilation air in one section of Crown Mines being closed off at 3.45. If one adds a very conservative half hour for travelling and hoisting and non-compliance with the new Act regarding Sunday work, this would give a 10 ¼ hour day or over 70 hours a week. If Sunday was not worked it would still amount to a long week of over 60 hours (Moodie 2005:548,560). Alternatively, Moodie presents evidence suggesting a nine hour day - a 63 hour, 7 day week or a 54 hour, 6 day week (2005:556).

Whatever the hours worked, these early references establish the close association between hours spent at work and occupational health, which is standard in the current literature on working time arrangements. A contemporary at the time noted that '… the life-span of miners, and in particular rock-drillers, was no more than five to seven years after commencing underground work' (Katz 1976:334). It was to take a General Strike and some years after that for the Act to take effect, the legislation not always effectively regulating working hours, or, by implication, health and safety matters. The Economic Commission in 1913, for instance, was 'astounded' by the amount of overtime worked (Katz 1976:337). Until 1919, then, these men were working considerably in excess of the legally permitted maximum.

The working hours of African labourers followed a similar pattern. A description a few years later of a typical working day for an African mine worker noted that:

> Mineworkers were roused from their sleep at 3am, sometimes they had breakfast, but more often they just dressed and made their way in an organised fashion to the clerk's office at the mine shaft where they queued to clock in. After descending the shaft they made their way to the waiting place where they stood until the white supervisor arrived for they could not start work without him.[68] For eight hours or more they worked under the supervision of white

[68] Black workers have waited unproductively with '…the loss of large numbers of man-hours while the gang of black workers waited at the foot of the shaft for anything up to an hour' since at least 1914 (Wilson 1972:115). My own diary from 1999 notes that on the first day underground waiting with the general workers, I waited for two and a half hours to be hoisted to surface for reasons I never managed to establish. This was, however, unusual.

> miners without rest or meal breaks. At about 2 or 3 o'clock in the afternoon they collected at the shaft bottom and waited for the white miners to ascend so that they could follow.[69] That wait could last from 2 to 3 hours. They were usually back in their hostels at about 5pm when they had their evening meal (Allen 1991:254).[70]

This amounts to a full working day of anything between 12 and 14 hours. For these early years, a working day underground of between nine and 15 hours has been noted (Callinicos 1994:111-12).

Early on at the outset of this period, in 1911 white pump-fitters were retrenched at the gold mine at Randfontein Estates, when the three-shift system then common was abolished on this mine. The men contended that their conditions of work had been altered and that African workers subsequently performed their responsibilities. Pump men were working between 58 and 70 hours a week (Katz 1976:332). Work was paid by the shift as opposed to hourly, a system that was apparently open to abuse and was a matter of general concern as it meant overtime amounted to unpaid work. Fifteen years later on the same mine, 4 000 African workers from Mpondoland would protest at the extension of their labour contract (Breckenridge 1998:102). Both measures attest to an industrial

[69] Hoisting up and down in the cage was racially segregated. For instance, in the late 1990s and early 2000s, the now racially integrated hoisting was the source of mutters mid-shift among some old-timers - white supervisors, particularly - when the age-old assumption resurfaced that all black workers were presumed to be at the rock-face.

[70] A decade short of a century later in 1999 and 2000, this routine remained much the same. I would rise around 4am, shower and kit up and join the queue at the swill bay for four slices of bread and *mageu* (soft porridge), queue at the cage, drop underground, queue at the shaft station, walk or tram down the haulage, break off down to the waiting place, wait for the team leader to make safe, spend around six hours in the stopes and repeat the process: often waiting around an hour for the hoist up (depending on the mine) and get to the surface around 1.30 and go to the swill bay for lunch. It would be around 3.30pm by the time my PPE (Personal Protective Equipment: boots, overalls, gloves and other paraphernalia) had been scrubbed, making it roughly a 10 to 11 hour day. Research colleagues at deeper levels would take longer, initially leaving me wondering, as the research 'team leader', when the last of the younger research fellows would arrive safely on surface.

working time regime marked by the maximum length of time men were prepared or felt themselves able to work.

The 1911 Mines and Works Act clearly did not take immediate effect or yet apply to even all white working men. In a Workers' Charter, formulated in 1913, organised white workers demanded 'The establishing by law of a maximum eight hour working day (to consist of a 48 hour working week) for all trades…' with workers also demanding payment for an additional shift in the event of working five consecutive night shifts and the abolition of all Sunday work and Saturday night shifts (Katz 1976:488). As Katz puts it, the Saturday night shift 'affected workers' enjoyment of Sunday' - for those who did have the day off - as they had to report for work on Sunday at midnight after having worked until midnight on the Saturday. A concession at some point was made to start the Saturday morning shift at six in the morning and end at 2pm. Identifying the date would pin-point the origin of the Saturday 'half-holiday' - technically still in place for most workers on the mines in 2010, although only twice a month as a result of the 1978 Franzsen Commission 'compromise' arrangement.

Ten days' continuous vacation was proposed for any white worker who had 12 months' continuous service underground or two years on surface. This was eventually won after the 1913 General Strike. In addition, men at the time, wanted 'time and a half' for overtime, 'time and a quarter' as a night shift allowance and 'double time' for all work performed on Sundays and public holidays (Katz 1976:487-505).

However, in 1914, when one compulsory rest day in seven was introduced on the then Rhodesian gold mines 'it was resisted by all sections of the industry for reasons which the medical Director found "feeble and unconvincing"' (van Onselen 1980:52). Rhodesian miners were on a 56 hour week under similar circumstances to their South African counterparts (Phimister 1977).

The issue of working time, long a matter fraught with concern, has again asserted itself. Indications are, as a following chapter will argue, that it is likely to assume more attention

in the future as variable and continuing working time shift rosters and schedules are increasingly introduced in mining.

4.3.2 Working hours and the 1913 General Strike

Many factors 'combined to create the atmosphere which resulted in a general strike in 1913' (Katz 1976:360). It is a well-documented fact that working hours were responsible for starting a train of events during a recessionary period that sparked the strike when the five and a half hour Saturday shift for five underground mechanics was extended to eight hours at New Kleinfontein mine (Cartwright 1962:164; Katz 1976:382; Davies 1979:120; Yudelman 1984:95; Hyslop 2004:200). Miners traditionally worked the Saturday as a normal working day, but not the artisan mechanics; the refusal of the five mechanics to work the additional half day precipitating the strike (Visser 2008:22).

The relation between hours and wages in the adjusted piece rate system was at the heart of the strike, according to one account (Walker and Weinbren 1961:1-13). Management's proposal that work start at 4.30am, if workers wanted the half-day off, which meant workers leaving home at 3am and exacerbated the prospect of already susceptible miners contracting pneumonia in the early hours, has also been noted (Visser 2008:23). In addition, not only would such a shift configuration have overlapped with the night shift, but workers would have had to confront the dust, which would not yet have settled, according to Visser's account.[71] Visser goes on to note in his official history of the MWU - yet without giving us a date - that demands for the eight hour day were used to mobilise sentiment at mass meetings, organised by the Transvaal Federation of Trade Unions, for establishing a South African Federation of Trade Unions. While working time and the related matter of workers' health was clearly the central issue initiating the strike, the political call for the unified broadening of the white working class in this fraught period

[71] Visser (2008) implies that there was blasting on the night shift and that by agreeing to start the shift early to gain the Saturday afternoon off, workers would have walked into the as-yet unsettled dust. Precisely when blasting occurred in these early years and how long it took the dust to settle is again a matter for the historian.

represents a moment of evidence for the thesis that labour time was more than simply the trigger resulting in manifold effects rippling out into society at large.

The year before the strike, Archie Crawford, a prominent trade union stalwart, who played a leading role in the establishment of the Amalgamated Society of Engineers, had predicted that:

> … a miners' strike would follow the failure of the parliamentary Labour Party to carry a bill for an eight-hour day from 'bank to bank' or from the time of going below to the time of return to surface (Simons & Simons 1969:156).

The Bill was not carried and the strike occurred as predicted (Moodie 1997:2). This was despite the fact that eight hours had been laid down by the Mines and Works Act two years previously in an ambiguously worded piece of legislation that had not been implemented and for which a struggle had to be launched. The strike was led by the SA Engine Drivers' Association and the strike committees' demands were 'quite explicit' (Katz 1976:388). The men demanded that working hours were to be from 7am until 3.30pm on weekdays and from 7am until 12.30pm on Saturdays. This demand was for the 48 hour working week already inscribed in the law (Katz 1976:386-388). The full details as laid down in JT Bain's terse letter of demand have been recorded (Hyslop 2004:204). The dispute centred on whether the 48 hours stipulated in the Act referred to working time being measured from 'bank to bank' or time spent underground 'at the face'. What complicated this ambiguity was that on some mines separate arrangements had been made by the men and management to work longer mid-week shifts in order to work a half-day Saturday. Such arrangements would be found on the mines just short of a century later. Matters relating to working time, implicating an exceptionally broad range of institutional and organisational forms of activity, are immured in complexity, as examination of the contemporary period will show.

It was JT Bain who, according to Katz, allegedly 'politicised' the issue by calling for legal enactment of eight hours 'bank to bank' in his own personal capacity, in addition to his being the signature on the letter of demand from the strike committee, of which he was the secretary (1976:392). There is a dramatic account of the strike and Bain's central role

(Hyslop 2004). After a violent strike, which the then Minister of Mines, FS Malan, considered to have been '… engendered partly by… the "absence of the human touch"' (Katz 1976: 341), the working of eight hours 'bank to bank' was not achieved. This demand, surprisingly, was not a formal demand of the strike (Hyslop 2004:223). In the aftermath of the strike, the matter of the eight hour day 'bank to bank' was, however, among other issues, explicitly raised and its establishment apparently agreed to at the Carlton Hotel meeting in Johannesburg between Prime Minister Louis Botha, the Defence Minister Jan Smuts and the Transvaal Federation of Trade Unions, but nothing came of this (Visser 2008:25). JT Bain's mobilising appeal in 1913 consequently remains somewhat of an elusive ideal, as many workers continue, almost a century later, to generally work longer than eight hours underground for a variety of reasons.[72]

The 1913 Economic Commission, following the General Strike, investigated wages, working hours and the cost of living on the Witwatersrand. The strike did wring 10 days' leave on half-pay from the Chamber of Mines, a demand that had first been raised in 1907, and explicitly stated in the Workers Charter of 1913. It appears, though, that this victory of paid annual leave only applied to senior officials. According to a popular writer committed to justifiably extolling the astonishing achievement of extracting gold from the deepest recesses of the earth:

> … in 1915, the Chamber without any demand from its daily paid workers, instituted a system of ten days annual leave on pay for all mine employees who had completed two years of service. In 1918 this was extended to a fortnight and the qualifying period reduced to one year (Cartwright 1962:212).

[72] At the time this was written (2007), a fellow ethnographer, Sizwe Phakathi, reported from a mine hostel that the time from 'bank to bank' was often longer than the stipulated eight hours, rock drill operators being the occupational group most affected. The personal assistants (PA's) of the miner would have been even more significantly affected, for they can only charge up the face with explosives after the rock drill operators have completed their work. Incidentally, the PA's were previously called '*piccanns'* (literally 'small boys', their adult status notwithstanding) and the term is now applied (because it serves as a job description) to women on the platinum mines (Benya 2009).

Trade unionists at the time applauded these unprecedented moves, which were described as a liberal scheme of holiday leave. This concession is only explicable in terms of wartime skilled labour shortages, a pattern that is repeated throughout the tracing of this summary history. For controlling the social organisation of production (one of Marx's six factors impacting on socially necessary labour time) marks the attempt to establish the time necessary for workers to expend in production in order to ensure the institutional survival of business concerns orientated to producing a profit.

4.3.3 Stasis in the length of the working week: 1919-1977

Working hours remained on the agenda of organised white labour. Workers who balloted in February 1920 to go on strike for higher wages and a shorter working week managed to obtain an increase of eight shillings a day, but their demand for reduced hours was not met. Later in the same year, when African workers went out on a strike that Phillip Bonner (1979) argues was of greater significance than the 1946 black mineworkers' strike, not only did they not win their demands, but the men '… went back to work at the old rates of pay and, after a few months, to a longer working day' (Simons & Simons 1969:230). More significantly, this extension of labour time was a result of the Low Grade Mines Commission of that year, after which the industry ' …revised work schedules so as to make Africans put in an hour more a shift without an increase in wages' (Simons & Simons 1969: 238), thereby effectively reducing wage rates by lengthening the working day. The Commission found that work underground was inefficient largely due to due to the fact *'dat swart mynwerkers baie ure per skof ledig ondergrond deurgebring het'* (Visser 2008:30).[73] The Mineworkers' Union (MWU) contested this finding. For it suggested they were not doing their work of properly supervising African workers by not getting to the stopes on time and leaving the labourers to wait unproductively underground for their arrival. There was a white labour shortage at the time, but the MWU maintained the industry exaggerated this shortage and could not admit to any of their members being 'personally liable' for the fact that labourers were waiting, as this would strengthen the industry's demand that the colour bar be relaxed.

[73] That black workers were spending many hours idle underground.

The eventual agreement, which related to white supervision over black workers, turned on a detail, the contractual verbal fine-tuning of removing the word 'personal' being provided by Jan Smuts. This formulation satisfied the white miners. It also left open the reason African workers were left sitting idle underground, and hence satisfied the industry. In Wright's terms, the matter turns on unperformed surplus labour, that temporal portion of the working day relating to struggles over control of the labour process (Wright 1981:67). A fuller account of this struggle is provided by Visser (2008:30-31).

The point is that black workers toiled for long hours underground during this period. African workers would leave the compounds from four o'clock in the morning and return between two and six o'clock in the afternoon, having spent 12 hours underground without food[74] (Simons & Simons 1969:275). Working hours very much like these are mirrored in an informant's account to a researcher 70 years later (Meel 2003). My own hours in 1999 and 2000 were somewhat less, being from around 5.30am to 2.30pm, 'door to door', while living in the compound directly adjacent to the mine.[75]

[74] A 'sociology of food', important regarding the currently pertinent issue of fatigue in South African mining, awaits definition. See James (1987) who introduces the issue. African mineworkers seldom eat underground. White miners and artisans in the underground workshops do take food underground. Men in stoping and development crews were, however, never witnessed taking food down. An informant was clearly caught between sharing a mealie cob I had taken down and awkwardly eating - reluctantly pip by pip so as not be rude - in front of a stony-faced group of work-mates at a very packed 'waiting place' where instructions are issued before entering the work-place to start actual work.

The issue of food has become more complex given the presence of illegal - or *zama zama* - miners underground, the industry and the NUM having struck an agreement that no food would be taken underground in order to cut off the illegal miners' food supply (bought from regular mines at no inconsiderable cost).

[75] My seven room-mates had all invariably by then left to get to earlier shifts, but I did not record and cannot say what time they returned. What I can say is that at the end of my very first long working week I awoke late on a Saturday afternoon to find my wet and sloppily discarded overalls washed, dry and neatly folded at the end of my bed, courtesy of the older taciturn man who slept on the bed alongside mine. Mineworkers look after novices in such ways.

Meanwhile, to return to the chronological narrative, white workers did win reduced hours, or rather, to be more precise, this 'reduction' simply brought them closer to the hours specified in the Mines and Works Act of 1911, promulgated, but not implemented, a few years before. The economic context was the profitability crisis in mining stretching from 1913 to 1922. The temporal gains won by organised white labour were founded on the labour shortages around the First World War (Johnstone 1976:96-99). The productivity of black workers started dropping in 1914 and continued to do so in 1915 due to a shortage of white labour responsible for supervision under mining regulations (Yudelman 1983:135). In 1915, for instance, mechanics won a 50 hour maximum work week, reduced to 48 hours in 1916, yet not without what becomes a pattern in mining regarding working hours. Two hours of *compulsory* overtime brought their hours back up to 50 with the same stroke. This amounts to a small wage increase, minimally increasing the value of labour time, but maintained the number of hours worked. This arrangement was, however, to be taken back to 48 hours without compulsory overtime the next year in 1917, no doubt due to wartime labour shortages. This simply brought them in line with the regulating legislation and cannot be granted the moniker of a genuine reduction in hours, as Johnstone (1976) will be seen to have claimed.

In this same year of 1917, underground white workers achieved a 48 ½ hour working week ('bank-to-bank') and a short Saturday shift (which persists to this day), yet still shy of the number of hours specified in the Act promulgated six years earlier. The 48 ½ hour working week 'bank to bank' was introduced more generally the following year in 1918. It has been suggested that it was a 48 hour working week that came into effect in this year[76] (Lundall 1990:66). Whatever the case regarding this half hour, these working times applied to white working miners, with African workers simply having to wait longer underground, as they certainly did even decades later.

[76] The precise year workers won the 48 hour working week remains somewhat in dispute, as Moodie avers this was won in 1917 as a result of a series of wild-cat strikes (1997:13). Whatever the case, this increases the cost of African labour-power.

Reduction workers finally won their Sunday off by achieving a six day working week in 1919, seven years after promulgation of the relevant Act and lagging behind the first Convention of the International Labour Organisation (ILO) that year, which articulated labour's demand for the eight hour day (McCann 2004:11). Reduction workers currently generally work continuous operations, this concession reverting at some point, including doing Sunday work.

Due to wartime labour shortages, the rising cost of living[77] and 'other developments', organised white labour secured a series of reductions in working hours between 1915 and 1919 (Johnstone 1976:101). Johnstone notes:

> A most significant feature of this reduction of working hours secured by the white workers … was that … it reduced the productivity of African workers, who worked under the supervision of white workers.[78] The shortening of the working day for white workers was a shortening of the working time of all workers (1976: 98ff).

The value of the labour time of African workers was systematically reduced as organised white labour won their reductions in working time. Aside from the fact that the working hours stipulated in the 1911 Mines and Works Act had yet fully to be implemented, the 'reductions' in working hours for white workers did not apply officially to African labourers; but Africans' *actual* working time underground was reduced by an average, Johnstone tells us, of between one and two hours. This had the impact of reducing the tonnage handled per worker employed in shovelling and tramming by 15%. As far as the industry was concerned, this had significantly more serious implications than this figure suggests. Johnstone quotes the President of the Chamber of Mines in 1926 on the issue:

[77] Prices rose almost 50% between 1917 and 1920 (Wilson 1972:9).

[78] Men still wait underground at what is called 'the waiting place', but now generally wait for the black team leader as opposed to the white miner to arrive and supervise to 'make safe' in the stopes. This has been the pattern since at least 1977 when an 'exemption' from Regulation 8.8 of the Mines and Works Act allowed white miners to give permission to team leaders to enter the stopes to 'make safe', which signaled white workers' final loss of direct control over the labour process (O'Donovan 1985:67)

> The loss of profit from a reduced output far exceeds the proportion of output lost, since all the profit arises only from that part of the output exceeding the critical percentage. Thus, in the case of a mine whose critical percentage is 80 percent, a reduction of 10 percent in tonnage means a loss not of a tenth but of half its profit (Johnstone 1976:101).[79]

Whatever the case, this reduction in white workers' hours pushed up the relative labour costs of the mass of the physically labouring workers, in other words increased the value of African labour power. To be more precise, as will be explained below, it increased their socially average necessary labour, for this was a struggle over social standards of living, to which this analytic component of the working day corresponds. The indissoluble relation between working time and output in any production environment is an obvious one. Under conditions where full mechanisation is precluded from the core production environment (i.e. the stopes), a reduction in working time assumes even greater significance for mining's institutional survival and profitability than cost minimisation via the maintenance of a low wage structure and the depression of wage costs. A general decline in productivity has been attributed to this temporary reduction of white workers' hours (Johnstone 1976:98ff). This argument has implications for Harold Wolpe's 'cheap labour thesis', which has again[80] recently been challenged on grounds other than ones rooted in production (Alexander 2008). This matter receives attention below.

Having belatedly secured the working hours legislated in the 1911 Act, including finally a six day week, with the recognition of Sunday as a day off, organised labour in the form of the South African Industrial Federation pressed on beyond Bain's articulation of the eight hour shift 'bank-to-bank to a call, in October 1919, for a 40 hour 'bank-to-bank' work week and 44 hours for surface workers. This is not won, but overtime is increased from 'time and a quarter' to 'time and a half' during this year, again amounting to a minor

[79] This view precisely mirrors Nassau William Senior's 'last hour', which Marx lampoons in *Capital* Volume 1 in relation to English capital's opposition in 1836 to the shortening of the working day (1977:215ff).

[80] A previous challenge, related to Wolpe's 'articulation of modes of production' thesis, a crucial aspect of his cheap-labour thesis, can be found in Guy (1979, cited in Marks and Rathbone 1992: 22).

wage increase, albeit on the overtime rate for hours worked, *in lieu* of a reduction of working hours. Working time remained an issue, a lightning strike taking place in November 1920 as a result of management at the City Deep gold mine having overstepped regulations regarding the eight hour working day (Visser 2008:34).

The intensity of the 1922 Rand rebellion drowned out the seemingly subsidiary temporal issues of the abolition of two public holidays and the withdrawal of cost of living and leave allowances, which were tied to shifts and which constituted significant percentages of cash wages. The Transvaal Chamber of Mines' demand for the abolition of May Day and Dingaan's Day (16 December) offended 'at one stroke, both Anglophone and Afrikaner workers' (Yudelman 1983:180). This was, Jeremy Krickler suggests, tantamount to presenting a red rag to a bull (2005). Visser suggests this move, issued in an '*uiters beledigende en ondiplomaties*'[81] letter from the Chamber to the South African Industrial Federation, announced not only its refusal to negotiate, but also the cessation of the two days as holidays (Visser 2008: 39). Francis Wilson indicates that these two paid holidays were only reintroduced in 1941 (Wilson 1972:48) while Wessel Visser suggests *Geloftedag*[82] - 16 December - was in fact only reinstated as a statutory paid public holiday in 1949 (2008:157). This is not to suggest 1922 can be read solely in terms of a labour time struggle, but rather that a preliminary re-reading of it in terms of labour time points to a deeper series of underlying factors that have largely gone undetected.

More to the point is that, in making the provocative move around the two cherished holidays, mining capital, having been finally compelled to increase the value of African labour-power by acceding to organised white labour's struggles finally to implement the Mines and Works Act, had to find a way to reduce socially necessary labour time. For, as Johnstone has been noted to have argued, reducing the time of white workers reduced the time of all workers, yet workers continued to be paid the same wage. With five of Marx's six factors impacting on socially necessary labour time being more or less stable – though

[81] Utterly insulting and undiplomatic.

[82] Day of the Vow.

more research is needed here - the industry simply had to reconfigure 'the social organisation of production'. This view goes beyond the tradition that the intention and actions of the mining industry are explained in terms of a quest to reduce the high costs of white wages by getting men to supervise more drilling teams. In short, the long working hours and increasing intensity of the work of African workers was and remains fundamental to the profitability of mining low-grade ore bodies at depth.

The relatively high wages of white workers had, nevertheless, to be reduced. The putting down of the 1922 strike by the military permitted the Chamber to cut wages by between 25 and 50%; eliminated the *status quo* agreement; replaced a large number of semi-skilled white workers with African labour; not only increased the number of workers the white miners were to supervise, but increasingly withdrew whites from physical labour by turning them into supervisors; and permanently replaced 2 000 white miners with African labour as the production process was reorganised (Visser 2008:42).

The events of 1922 had as an important *leitmotif* the fear that white workers would be pushed down into the ranks of the black working class (Krickler 1999, 2001; Visser 2008: 36-37). From the theoretical perspective espoused in this thesis, 1922 can consequently be read as a struggle by organised white workers to maintain their social standards of living and hence over the value of socially necessary average labour in terms of Eric Olin Wright's value-theoretic analysis (Wright 1981:67). Not being able to sustain such standards had, Visser avers, implications relating to workers' relationship with '*ander sosiale klasse*'[83] in the white community with which they wished to enjoy parity of status (Visser 2008:37). By defending its standards of living, the working class, it can be more generally inferred, were striving to attain broader social respectability. In the case of the Afrikaner mining working class, Visser states as much: white workers desired to maintain their status as *citizens* of a white South Africa (Visser 2008:37), a theme of white labour harking back to the General Strike in 1913, when *The Worker* proclaimed that 'a white

[83] Other social classes.

worker claims… to be recognised and treated…as a man and a citizen whose right to life, liberty and competence is as important as his "master's"' (cited in Visser 2008:352).

Although the ambiguous political victory of the Industrial Conciliation Act of 1924 two years later reserved jobs for whites and recognised white workers' trade unions, the organised labour movement on the mines then went through a period of quiescence for the next quarter of a century. There were, however, a number of working time issues that nudged the improvement of working conditions forward, even if real wages declined in the 1930s (Yudelman 1983:256). Given the unsolicited granting of paid leave during the labour shortages of World War I, this is only generalised for white workers in 1934 (Wilson 1972: 48-9). In this year, the 10 days' leave on half pay instituted in 1915 was increased to 18 days on full pay to white underground workers after completion of 312 qualifying shifts and to 24 days leave after 624 shifts; after 936 shifts, men continued to go on leave for 24 days, but with pay for 30 days (Wilson 1972:48-9). These working time leave arrangements increased substantially for white workers in the years to come. That the unions had been co-opted, had stagnated and lacked any semblance of militancy after 1922 is not in dispute, and if time-off is not important, then Yudelman is correct when he charges organised white labour for not having achieved 'anything important' between 1933 and 1939 (1983:245). The fact is that white workers' annual temporal reductions in working time, were 'bought off' with leisure time by way of increasingly generous periods of leave.

Black workers, meanwhile, continued to work without the benefit of equal rights at work or citizenship rights. This was to remain so until the late 1980's regarding trade union rights and until 1994 regarding formal political rights. Working hours clearly continued to remain considerably longer for black mineworkers than for their white working compatriots. They would, in value-theoretic terms, remain labouring at a physiological minimum necessary level to reproduce themselves and continue to struggle for their very physical subsistence and survival until unionisation in the early 1980's would add a historical and moral (social) component (although even this will be seen to be doubtful) to

the wage of a differently constituted African mining working class (see below and Chapter six).

Sketching the wretched life and atrocious conditions of black workers in the Communist Party newspaper *Umsebenzi*, in a broad organising appeal in August 1930, the paper noted that:

> As for hours we have to get up while it is still night, go on shift, often breakfastless long before our white 'bosses', remaining below till evening brings us exhausted the surface. To prolong our agony our contract time is spun out by loafer tickets[85] …so that after completing our dreary nine or eighteen months contract[86] in the bowels of the earth we return home no more advanced than we came (Allen 1991:331).

The African Mine Workers' Union was shortly to be formed, and while it barely managed to survive over the next decade, it nevertheless published a list of its demands in 1935, calling, *inter alia*, for the abolition of the migrant labour contract system[87] and the establishment of an eight hour working day (Allen 1991:336). Of a number of violent strikes and incidents across the mines over a range of grievances until the Second World War, at least one involved the refusal of mine workers to work on Sundays (Allen 1991:339). Beyond mining, calls for a 40 hour working week were increasingly being made, a Labour Party MP going as far as demanding a 36 hour working week in parliament (Lundall 1990:65).

[85] When workers failed to hand-drill a specified number of shot holes of specified depth, their work ticket for the day was not stamped; they were not paid for the day and, during certain periods, could not gain access to food. This 'loafer ticket', which amounted to forced unpaid labour (a form of absolute surplus value extraction as it lengthened the labour contract) and a source of deep grievance, deserves to be tracked in its own right and is not treated here. Michael Burawoy refers to both the compound system and 'short-term contracts' as obstructing trade union organisation in the mining industry 'until 1942' (1981:316-7). Such contracts could only have been offered to attract labour during the labour shortages of the Second World War.

[86] These differential contract lengths will be seen to apply to South Africa (nine months) and roughly to other non-South African labour on the one hand and to Mozambican labour (eighteen months) on the other.

[87] According to Wilson, in 1936, of the *white* miners, '89% of the 3 612 developers, stopers and shaft sinkers in the gold mines were contract workers' (1972:46, footnote 2).

Around this time, in 1938, in their struggle against the Afrikanerbond van Mynwerkers (ABM) (discussed in considerable detail by Wessel Visser) the MWU noted the benefits that had accrued to their members over the preceding years, the reduction of the twelve hour shift to eight hours being one of them (Visser 2008:68).

The length of the working day for black workers, however, remained longer than the statutory eight hours. In 1938, for instance, a study showed that half of all mineworkers were underground by 5am and that all but 6% were underground by 6am. While the majority had completed their work by 1pm or 2pm, more than half waited until 4pm to be hoisted to surface. This situation remained much the same 35 years later in 1973 (Allen 2003b:33). Travelling time of between an hour and three quarters and three and a half hours, was noted in this 1938 study and again in 1973. This amounts conservatively to roughly eight hours 'at the face' and 10 to 11 hours 'bank to bank'.

In 1999 and 2000, I went to live in the hostels and go down underground with the shift across a number of gold mines. Depending on the mine, its depth, the number of cages (hoists) to catch, the distance from the shaft station and whether you had to walk or not, travelling time underground *had* shortened and could be anything from half an hour to an hour and a half. This was essentially an eight hour 'bank-to-bank' shift, but with waiting in queues, time in spent in the lamp room and scrubbing up, it still occupied around 10 hours of my day.

To return to the chronology, however, the Factories, Machinery, and Building Work Act, 22 of 1941 (section 19) reduced the hours of work from 48 to 46. The Act did not apply to mining. The working week for shift-working mine personnel, however, could extend to 48 hours on condition that two hours of overtime be paid. This Act changed legislation related to shift work. Section 33, for example, enabled the minister to sanction types of work that in his opinion constituted 'an activity in which continuous work is necessary, to be an activity with respect to which work may be performed continuously in three shifts per twenty-four hours, seven days a week' (Adler 1991:10). It would take 50 years before this would be applied to underground mining operations, with men continuing, until the

1990s and beyond, to work the Eleven Shift Fortnight (ESF), 96 hours averaged over two weeks, effectively an irregular 48 hour work week.

In 1943, in their submission[88] to the (Lansdowne) Native Wages Commission, the AMWU, affiliated to the Council of Non-European Trade Unions (CNETU), provides what is almost certainly the first detailed account by organised black labour of working hours, the union having been resuscitated two years before in 1941. The AMWU noted the length of the shift as eight hours, in other words at 'the face', excluding travelling time underground, or, as the submission put it: 'This does not include the time spent getting to work[89], or the time spent waiting underground for the European miners to arrive. Nor does it include the time spent getting back'. From 'lining up for breakfast, walking to the shaft head, lining up for the cage going down and waiting at the station …it takes the miner three to five hours actually getting to the place of work and returning home' [90] (Allen 1991:461-2).

A census conducted by the union at Robinson Deep recorded that the time from 'bank to bank' was approximately 9 ½ hours, while including walking to the shaft head and lining up, the mineworker 'probably spends in this way nearer to 12 to 13 hours on some mines' (Allen 1991:462).

[88] This submission is usefully appended by Allen to the first volume of his history (1991:428-470).

[89] Compounds were not always adjacent to the shafts, some currently leading directly from the compound hostel via an enclosed passage to the 'crush' (the lamp room) where workers clock in, as were the original compounds on the diamond field (Crush 1994). Elsewhere, such as the then much heralded Joel mine built in the early 1980s, buses transport the shift the relatively short distance to the centralised change rooms and then to the shaft-head.

[90] The time travelling from the shaft station to the working rock faces was, interestingly, not mentioned by the trade union statement. Though basic to the routine, this requires more intimate knowledge of the underground workings. This omission may, however, relate to the fact that the shaft-station was not as time-consuming a distance from the rock face in the 1940s as it is in some mines today, which had already had a more than fifty year old 'life-of-mine'. On the other hand, some of the mines worked then were already at the end of their life and travelling time may have been equally long.

The AMWU submission in addition observed that '… even the so-called 8 hour shift is not always observed'[91] (Allen 1992:462). A range of times and occupations provided in this submission includes accounts of 12 hour shifts and longer. The union appealed to the provision in the Factories Act of a lunch break to apply to the mines, and noted that in mining there was no provision for leave for black workers, white workers having won the hours stipulated by the Mines and Works Act of 1911, paid holidays and a range of other time related benefits 25 years before (Johnstone 1976:98-9). Towards the end of 1942, workers at Langlaagte, for instance, protested at having to work double and treble shifts and complained about overtime rates at the same time (James 1987:9). Instinctively and perhaps even consciously, workers were protesting against the devaluation of their labour-power by struggling for fairer working time arrangements.

While overtime rates were lower than those of the white miners, the AMWU submission indicates that hours worked were not calculated accurately, if at all.[92] An appeal was again made to implement the regulations as laid down by the Factories Act. In the following year, in March 1944, as a result of the Lansdowne Commission Report, it was recommended *inter alia* that African workers be paid the same overtime rates as European workers, and be paid time and a half for overtime and work on Sunday, and that long-term workers be granted two weeks' paid annual leave, none of which was accepted by the Chamber. In order to maintain labour supplies, until January 1943, a small bonus was issued, which was tied to labour time and *increased with the number of shifts worked*; but this practice came to an end with a nominal increase in the basic minimum rate of pay, which resulted in more mineworkers being on the same rate for the duration of the 360 shifts in their contract.[93] Such measures incrementally chip away at the value of the

[91] The longer hours worked by African mine workers suggests that the legal number of hours negotiated with organised white labour did not always apply to these men.

[92] Given that a calculating machine, designed to keep a detailed record of African mine wages and working hours, had been used on some mines since the early 1930s, this introduces a range of possibilities regarding the calculation of working times. Either times were calculated and not paid or times were not in fact known on other mines, as the AMWU claimed.

[93] The contract referred to would have been the Mozambican contract. It may also have referred to

socially necessary labour time expended by this echelon of abstract labour and keep wages hovering around or just below subsistence levels. During the years to come, with the outbreak of the Second World War, the gap between wages paid to whites and those paid to blacks was to widen (Wilson 1972: 46).

At AMWU's conference two years later, in formulating the demands that would result in the mineworkers' strike of 1946, in addition to the key demand of 10 shillings a day, which would precipitate the strike, the demand for two weeks' paid annual leave was included. Incidentally, an official report in this year indicates that shaft sinkers, workers almost certainly exclusively from the then British territory of Basutoland, were working a continuous shift system, three shifts of eight hours, 24 hours a day (Guy & Thabane 1988:263).[94] The capital involved in sinking a mine required the continuous labour time of this echelon of abstract labour, thereby extracting a peculiar, deferred form of surplus value (in Marx's terms): considering that the capital investment in sinking a shaft has yet to turn a profit, the value workers create constitutes part of the potential capital value of the mine itself in the future.

Lansdowne's report was considered at the AMWU AGM in August 1944 (Allen 1991:391; Luckhardt & Wall 1980:65,69). The AMWU called for the full implementation of its recommendations despite finding them 'hopelessly inadequate and unsatisfactory' (O'Meara 1979: 203). The government of the day and the Chamber of Mines rejected the Lansdowne Commission's recommendation of paid annual leave, thereby again minimising the value of socially average necessary labour of African workers. The Chamber rejected most other recommendations proposed (Simons & Simons 1969:571).

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the Lesotho contract.

[94] An official industry description of the rhythm of the lashing labour process attests to the skilled co-ordination and speed workers executed in order to get the job done within the eight hours of the continuous shift regime (see Guy & Thabane 1988:264).

As the AMWU enjoyed no legal standing and had virtually no access to black miners, African mine workers, largely left to their own devices and existing networks, would go on strike in 1946 two years later (O'Meara 1979; Moodie 1986). Their efforts would have no impact on working hours. A long day and a six day week, amounting at a conservative estimate to around 60 hours a week, would remain unchanged for more than 30 years (Allen 2003:35). Such a sustained working time regime strongly suggests a regime dominated by absolute value extraction.

What is absolutely critical to bear in mind here is that to which the literature has so widely and justifiably discussed - the exceptionally harsh reality of the migrant mineworkers' living environment of the compound system. The AMWU argued that the compounded mineworker was technically an employee for 24 hours of the day. The AMWU suggested that working time be from the point at which the worker left the mine compound until he returned to serve out another labour contract within the strictures of compound life. This was never to materialise.

4.3.4 The struggle for the five day working week: 1947-1977

Shortly after the Second World War, organised white labour, under the banner of the Mining Unions' Joint Committee (MUJC), took up the struggle for reduced hours by way of engaging the Chamber of Mines over a five day working week. This was a continuation of a struggle to last for another 30 years. The threat of a strike by the MWU, well supported by members, finally forced the establishment of the Franzsen Commission in 1977. Franzsen's first report usefully tracks the outlines of this engagement; the following paragraphs heavily depend on it.

In June 1947 the MUJC approached the Gold Producers' Committee of the Chamber 'to accept in principle a 40 hour week without reduction in pay' (Franzsen 1977:15). After a meeting in September 1947, the industry declined the request on the grounds that the working profit on 13 mines would be eliminated. Not long afterwards an approach by the Mining Unions' Joint Committee to the Prime Minister led to the establishment of the van

Eck Commission (Commission on Conditions of Employment in the Gold Mining Industry).

4.3.5 The van Eck Commission of 1950[95]

The MUJC proposed to van Eck that workers be divided into two shifts on each mine. Each shift of men would work two Saturdays out of four each month, this being a 40 hour week, Monday to Friday, with the additional four hours for the two half day Saturdays to be paid as overtime. The proposal is an interesting one. It suggested a formal 40 hour 'man-week', but amounts to maintaining the *status quo* of a 48 hour 'mine-week'. This proposal is tantamount to a wage increase by way of the overtime rates to be paid for Saturday work and an eight hour day for the men. For the first time it draws the distinction between the 'man-week' and the 'mine-week', i.e. 'the length of the production process' as a whole *a la* Mosselmans's analysis (2004). The van Eck Commission found that this would result in a loss of production that would not be in proportion to the reduction of hours worked by daily paid men (Franzsen 1977).

In challenging the MUJC, which presented evidence for a 40 hour week without reduction in pay, however, in evidence to the Commission the Gold Producers' Committee of the Transvaal Chamber of Mines found itself stuck over the crucial issue of net surplus value. It was forced to acknowledge that:

> As there is no past experience in the Gold Mining Industry on which to base this conclusion [concerning the probable effect of the adoption of a 40 hour week] only estimates and opinions based on knowledge of mining conditions in the industry, acquired over a long period, can be given (Gold Producers Committee 1948:4).

The concern of the industry probably turned on whether the overtime hours were enforceable. Yet, not only does this point to the stability of working hours in the previous thirty years; the concern to ensure net surplus value hinged on the fact that as 'much of the output of the Native labourers is dependent on their physical effort and as the time of

[95] This government commission (UG No 28 of 1950) was not published.

this physical labour is already less than 48 hours per week…' a decrease in output was anticipated. The phrase 'already less than 48 hours a week' presumably referred to the number of hours actually spent working during a shift. In the absence of accurate data and relying on estimates, ranging from between 12-24% anticipated loss of production, and averaged out at an estimated 18%, the industry was compelled in the interests of net surplus value to defend the length of the working day.

The length of the labour contract (to be discussed in the next chapter) was given as a reason by the Gold Producers' Committee who led evidence that the forty-hour week:

> '...must be ruled out because of the unrest that would be created amongst the Native labour force who, in order to complete their contracts of service calling for a specified number of shifts to be worked *would be obliged to spend approximately seventeen percent more time at the mines* than they do under present conditions' (1948:3) (my emphasis).

Needless to say, the van Eck Commission did not result in a reduction of working hours.

4.3.6 The Freedom Charter

In 1950 the demand for a 40 hour working week was again raised by organised white labour. The Chamber again declined the demand, but with the concession that six days, in addition to annual leave, could be taken on a voluntary basis as from August 1951.

In 1952, the year the Defiance Campaign was launched (Dubow 2000), the Mining Unions' Joint Committee requested the Chamber that members have an 'occasional' Saturday morning off, later to become every second Saturday a month. Both requests were declined, with a Conciliation Board being appointed over the dispute, but not reaching a settlement, the artisans' unions, under their own umbrella body party to the MUJC, the Mechanics' Union Joint Committee, dropped the issue.

Concurrently with this series of tabled proposals by organised white workers, the demand for a 40 hour working week was raised for the first time by the very different constituency

opposing the recently formed apartheid policies of the South African State. At the Congress of the People in Kliptown in 1955, a broad non-racial and cross-class alliance of civil society, the broad-ranging Freedom Charter, articulated the same demand with specific reference, among others, to mine workers:

> There shall be a forty hour working week, a national minimum wage, paid annual leave and sick leave for all workers and maternity leave on full pay for all working mothers.
>
> Miners, domestic workers, farm workers and civil servants shall have the same rights as all others who work.

The demand was not, on the face of it, an unrealistic one, good trade union organisation in the Garment Workers' Union having already won it (O'Meara 1983:94).[96] Industry-based research had noted that long working hours were 'specifically mentioned' as a disadvantage of mining as 'The underground shift is continuous, without a food break, and the time spent underground is long' (Parsons 1977:26, citing Hudson 1954:35). Namibian mineworkers were certainly working twelve hour shifts at this point (Cooper 1999). Yet in both gold and platinum mining today, this basic demand of workers cannot be met until such time, it will be argued, as greater control over production is afforded the workers who know most about the important details of the particular job they perform. Forty hours can only be met in the event of significant organisational reconfiguration underground. A 40 hour working week, in a regular working time arrangement, remains to be met in 2011 even though, under the irregular hours (which workers resist) of continuous operations, a forty hour week, measured in terms of the 'man-week', is possible as Chapter seven will show.

Radical demands that 'the mines will be transferred to the ownership of the people, wherever there is a Gold Mine there will no longer be a compound boss' and 'there will be a committee of the workers to run the Gold Mines' (Luckhardt & Wall 1980:337-8)

[96] Where, in submitting evidence to van Eck, the unionists had appealed to shorter hours in the British coal mining industry, the Gold Producers appealed to the 'social structure' in South Africa and the political constraint on mining operations of the racially defined 'non-scheduled person'.

contrasted with the harsh reality of the recently formed South African Congress of Trade Unions (SACTU), with the ex-Chairman of the AMWU, JB Marks, banned, and the official history only able to note that 'contact was intermittent with mine workers' (Luckhardt & Wall 1980:192; Allen 2003a:265). It might be noted that the raising of the issue of the nationalisation of the South African mining industry in 2010 has yet to raise worker issues at all.

In any event, in line with the Freedom Charter's demand for a 40 hour week and despite the fact that some, largely black women workers beyond the mining sector, had won it, a decade later, in June 1961 the exclusively white male MUJC yet again proposed the 40 hour working week be phased in over five years with no loss of pay. The Chamber politely refused. At the same time, SACTU's mining National Organising Committee (NOC), established in 1958, was clandestinely distributing propaganda pamphlets in the compounds to commemorate the fifteenth anniversary of the 1946 mine workers' strike and renewing its emphasis on organising mine workers. Their single open meeting was ringed with police, met with intimidation and issued in 'mixed results', no significant headway being made, with only 100 paid-up members registered in the year. Miners were 'not allowed to leave their fenced-in areas from the beginning to the expiration [sic] of contracts' (Luckhardt & Wall 1980: 193). SACTU's written communications to the Chamber were ignored and international representations to the ILO led to no material improvements for the mine workers. Neither would the rival Trade Union Council (TUC), later renamed the Trade Union Congress of South Africa (TUCSA) in 1962 when it officially dropped its colour bar, have any impact on organising mineworkers - let alone have any impact on mine workers' organisation or working hours - throughout its existence.

In 1962, the SACTU-affiliated General Workers Union (GWU) did represent an unspecified number of diamond mineworkers calling for wage increases and 14 days' annual leave. 'The GWU memorandum of demands forced Oppenheimer to concede only minimal increments', but as usual, there would be no acceptance of working time related demands. Miners were then 'given five minutes to quit the Union or otherwise lose their

job' as the official history tellingly put it (Luckhardt & Wall 1980:194). There is no evidence in the secondary literature, to the best of my knowledge, that black mine workers participated at all in the national strike of this year. Indeed, this appears unlikely, there being no mention of mine workers in the official history recording numbers of workers per sector who heeded the call of the Congress Alliance at this time. With the banning of the African National Congress (ANC), SACTU was effectively suppressed from the following year onwards.

4.3.7 Organised white labour and the 40 hour week

Organised white labour, meanwhile, continued with legal, open and less militant, yet more sustained struggle. In 1962 the Mining Unions' Joint Committee repeated the demand for a 40 hour work week, but settled for a full day off a month (paid occasional leave) for all 'European' employees. This was a decade-old union proposal. The day off, however, would be offset against any future reduction of working hours. Such is the significance of labour time that even this minimal concession proposed by labour was, by their own agreement, to be re-absorbed in any future reductions of working time. Again, the importance of the value of the labour time of black African workers would have cast its shadow over negotiations, at least as far as the industry was concerned.

Two years later in 1964, the demand for the 40 hour working week was again made by the Federation of Mining Unions (FMU), tabled as the introduction of a five day working week. Organised white labour presumably felt they were getting somewhere, or at least the MWU heralded 1964 as the 'year of real successes' for the union, with three out of the six 'successes' noted relating to working time: 'the five-day week discussions', 'the paid holiday of Republic Day discussions' and 'negotiations on miners' service years' (Sitas 1979:35). The issue of the public holiday was, moreover, a source of tension in the relationship between a number of MWU leaders and the National Party parliamentary mine-study group, the latter not having played a sufficiently strong role in ensuring its passing, according to the trade unionists, who were shortly to be placed under pressure by an 'action committee' accusing the MWU of not having done enough to ensure Republic Day was declared a holiday for the mining industry (Visser 2008:180).

The sense of success was to be short lived. In March of 1965, Visser suggests, a political bomb exploded in the ranks of MWU members. The MWU leadership, forever tussling for power, as Visser's history all too clearly shows, had, under the leadership of Eddie Gründling, apparently already agreed to a year-long experiment (from August 1964 to June 1965) on twelve mines that would potentially permanently transfer traditionally reserved jobs to black workers, implicating the loss of between 5 000 and 6 000 jobs previously reserved for whites (Wilson 1972:115; Visser 2008:181). 'Large numbers of man-hours' were being lost due to black workers having to wait for the white miner (Wilson 1972:115). In the uproar that ensued, even the Minister of Mines at the time, Advocate Jan Haak, denied that he had been fully informed of the implications of the experiment. In the context of already tense relations with the National Party (NP) parliamentary study group and with an 'action committee' continually breathing down the neck of the MWU leadership, Gründling in particular, Visser suggests this issue, which amounted to a major threat to white miners' jobs as the industry sought to devalue their labour power if not eliminate it entirely, shook the MWU down to its very foundations (Visser 2008:181).

The matter went back to 1954 when the MWU general assembly launched an investigation around the possibility of getting poorly remunerated daily-paid white workers onto a more regular and stable monthly-paid basis. In the early 1960s the wages of many white workers were on the bread-line and 'in vele mynwerkersgesinne het daar broodgebrek geheers'[97] (Visser 2008:182). This was clearly a struggle over physical survival in Wright's terms (Wright 1981:67). The idea mooted was that young men who had not yet been able to source better paid contract work, as well as those too old to perform it any longer, would work 26 shifts a month. The Gold Producers' Committee of the Chamber was prepared to experiment with putting these daily-paid men on a monthly salary and raise their status by relieving them of certain duties as prescribed in the mining regulations. It appears that daily-paid men at the time were supplementing their income by taking on additional supervisory work by standing in for men on leave or filling vacant

[97] In many mineworkers' families there was a shortage of bread.

posts to the detriment of their health. This can only mean that either these men were working inordinately long hours or were literally dashing around underground attempting to supervise too many gangs of black workers. The envisaged higher monthly wage would enable them to be relieved of having to perform additional duties just to make ends meet and afford these workers better conditions of leave and a higher pension (Visser 2008:182-3). In exchange, a suitably experienced non-scheduled person, i.e a black 'boss boy', would be permitted to inspect working areas prior to starting work, the issue being that black workers were waiting for inordinately long periods of over an hour for a white miner to inspect the working areas and 'make safe.' The 'boss boy' would also be permitted to handle explosives. Again, the issue was not the expense of white labour, but the attempt to increase productivity by increasing the value of black workers' labour time by ensuring closer supervision with the anticipated result that '*ertsproduksie in die myne opgestoot sou word*'[98] (Visser 2008:182) (my emphasis) in the context of a fixed gold price and rising costs. The MWU sought the assurance of the Chamber that no white worker would lose their job as a result of the experimentation, but it was accepted that no 'scheduled person' would ever do it again once it had passed over to a 'non-scheduled' worker. Gründling was nevertheless to declare not much later that he would rather have 9 000 well paid workers in the mines than 16 000 'wat sterf van die honger'[99] (Visser 2008:186). The whole affair was to result in not only a political storm, a referendum within the ranks of the MWU and the appointment in May 1965 of a Commission of Inquiry - Insake Proefnemings op Sekere Myne[100] - which reported promptly in August of the same year. In the process Gründling was replaced and the MWU was destabilised and considerably weakened. Visser again provides the full account (2008:186ff).

In Wright's terms, this was a struggle initiated in the interests of the survival of white workers who were on the bread-line and turned around their struggle over the value of their labour power. The idea of these workers becoming monthly-paid was entertained by

[98] The production of ore would increase.

[99] Who were dying of hunger.

[100] Experiments at certain mines.

the industry as the actual length of the working day of black workers could be better utilised by eliminating a significant portion of their unperformed surplus labour. As Wright's schema contends, this ended up becoming a struggle over control of the labour process. White workers were required to relinquish an important, legally enshrined and regulated control over their work in exchange for the establishment of an acceptable social standard of living over and above merely satisfying the barest conditions of physical subsistence. This was not to succeed.

The completion of the experiment in June, however, must surely have emboldened the Chamber in the very next month to finally respond to the FMU regarding the five day week in the way that they did. For in July 1965, the FMU received the Chamber's rejection regarding the demand for a five day week: investigation revealed an increase in costs and a loss of production. From previously having rejected the *principle* of a five day work week outright, the Chamber at this point, however, changed tack. As stated in the Franzsen Commission Report:

> … the only possibility for the re-opening of consideration of this matter lay in the acceptance of all the Unions, parties to the industry's 'Closed Shop' agreement, of a *complete re-organisation of work* in the mining industry to offset increased costs and the shortage of labour which would be brought about by the introduction of a five-day week (Franzsen 1977:17) (my emphasis).

Once the implications of the 'reorganisation of work' dawned on the Unions - the age-old strategy of a numerical dilution of the white worker's position in production - the unions, in September 1965, sent a letter to the Chamber indicating that 'the time was not opportune to pursue the matter further' (Franzsen 1977:17). This strategy, increasing the size of the labouring gangs under the supervisory control of the legally privileged white miner and hence increasing the intensity of African labour-power, this became, I am suggesting, at least as, if not more important than cutting back on the value of the labour-power of organised white labour, as the tradition has it. To establish this contention more firmly would need closer examination than is possible here. Supervising more than one working stope which was clearly happening, for instance, especially some distance apart,

has a series of implications for the jobs of both the supervisor, the team leader and the gang. In 1999 I accompanied a miner who supervised no less than four gangs underground, each led by very competent team leaders who assumed virtually full responsibility for their sections despite not being in possession of blasting certificates.

Nonetheless, labour time remained central to the organised white working class on the mines. With white workers' organisations outmanoeuvred by the Chamber, the MWU took a different tack. In the following year in relation to health issues, the MWU put forward the following unusual working time demand: 'a statutory limit of 20 years on a miner's working life' (Sitas 1979:35). Such time-honoured skill born of long years spent at work underground - the differential value of skilled labour power in Wright's terms (1981:67ff) - could clearly not be sacrificed. This demand was never to be met.

Two years later, the Chamber approached the MWU with a new offer to institute a monthly-paid system, which the MWU rejected (Visser 2008:199). The new proposals would have not only cost white mineworkers' and miners' jobs, but effectively demoted half of the shift bosses to ordinary workers and half of all mine captains to the rank of shift boss. White workers would have, in the main, effectively become supervisors over selected groups of black 'boss boys'[101] (Visser 2008:200).

The next year, in 1968, organised white labour raised the five day week issue yet again. It appears a further investigation was conducted with the same results. The Chamber was not prepared, given the prevailing economic conditions, with a number of mines closing at the time, to accept the loss of production or the cost of additional labour some mines would require to implement a five day week. The Chamber reiterated the new stance adopted three years before and again tied their acceptance of the idea of a five day week to the unions' acceptance of 'a major re-organisation of work practice to improve productivity by the better utilisation of both White and Black labour' (Franzsen 1977:18). Working time issues would henceforth consistently to be tied to the re-organisation of production. If organised white labour wanted time off they would have to dilute even

[101] Currently referred to as 'team leaders'.

further their objective power in production by supervising larger gangs of African labour, as per long established traditions.

The industry was concerned not only about the effect of reduced working hours of the white miners. It was also concerned about the effect of the absence of the white miner from his regular job in the stopes and its effect on productivity. In 1971, COMRO research on one mine showed a drop of 40% if a miner was 'away' from his stope even if he was replaced by another white miner (White 1971:15). The extent of the movement of stopers from one mine to another, from one stope to another or absence from his regular working place, translated into a 10% drop in production of the mine overall, to repeat, even if the stoper concerned was replaced. This signals the crucial importance of the white miner, 'deskilled' though he many have been, and the impact his regular presence at work in the same stope had on the productivity of the African mineworkers underground. The labour time of the white miner was indissolubly related to the value of African labour power.

The white trade unions meanwhile continued their struggle for reduced working hours. From 1968 to 1974 the issue of a five day week was raised every year by one or other of the mining unions. Arrie Paulus, now heading a revitalised MWU which had been weakened in the wake of the monthly-paid time experiment, raised the issue publicly in 1969 (Visser 2008:209). In that year, in research conducted by the Chamber of Mines, production shift bosses were presented with nine problems and asked to rank them. While working hours were not on the list, 'the most frequently mentioned *other* problems were "long working hours" and poor working conditions' (Lawrence 1969:I) (my emphasis). The next year, however, the MWU won eventual recognition by the Chamber of their shaft representatives and in 1972 Republic Day was finally recognised as a paid holiday across the mining industry.

In 1973 in the following year, the South African Engine Drivers' & Firemen's Association sold off their racialised control over their jobs by permitting black workers to operate locomotives underground in exchange for elevation to the status of 'mine official'

and higher salaries, worrying Paulus in the process (Visser 2008:209). For by relinquishing control over this segment of the labour market and enabling a racialised devaluation of the value of labour power by mining capital, this occupation was ceded to African workers and lost as a membership base to the Mine Workers' Union. (This could be said to be an unusual form of the redistribution of the value of labour power as Wright's scheme (1981:67ff) has it (see Chapter 6.5.4 below). The saving in labour costs of the relatively large number of African loco drivers (working at lower rates of pay) would have more than offset the costs of the higher salaries and higher value of labour power (by virtue of additional training) of the racialised 'promotion' of a relatively few, newly 'elevated', white MWU workers to 'mine official' status).

In May 1974, when the issue of long working hours and the five day week was raised for the umpteenth time, an 'exploratory' committee was finally formed with discussions on 'changed work practices aimed at reducing anticipated production losses' in the event that a five day work week was introduced (Franzsen 1977:18). A series of counter-proposals by the unions were not deemed acceptable by the Chamber, whereupon the MWU in January 1975 formally demanded a five day week with no changes in work practice. Discussions continued, the Chamber calculating the loss of production of a five day week to be between 8,5% and 9%, a loss the industry asserted it could not absorb, despite a rise in the price of gold from just under R1 000 per kilogram in 1972 to over R3 000 per kilogram in 1974 (Mac Murray 1978:7).[103]

In May 1975, the MWU formally applied for the establishment of a Conciliation Board to settle the matter. The demand was a five day work week without any concessions granted on their part. To back up the demand, the MWU achieved a positive ballot tally of 88,72% of its members voting in favour of strike action (Visser 2008:209). The Board was established, discussions meanwhile continuing with the Minister of Mines, SP Botha. Agreement, Franzsen reports, was finally reached with the terms set out by the Chamber

[103] While both 'mining costs per ton milled' and 'costs per kilogram of gold produced' had been rising, these did not cancel out the gains of the increased price as the 'working profit per ton milled' had tracked the increased gold price almost perfectly (see MacMurray 1978:811).

in an eight page letter dated 24 November 1975. A similar letter went out to the white workers' trade unions in the coal mining sector. Both letters required the approval of the Government Mining Engineer and critically, as will be seen, satisfactory arrangements for a five day working week were also to be made with other worker organisations, i.e. the Artisan Unions. In addition, the gold mining industry, in the letter to the MWU, indicated the mines would require a period of preparation for the change to the new working time arrangement.

Some months earlier, dissatisfied with the slow progress on this matter, the Council of Mining Unions (CMU), of which the MWU was a member, had requested separate negotiations on the issue. Despite the division between the artisans and miners, organised white labour was now, after almost three decades, tightening the screws in their generation-long struggle over working time. With the CMU and the Chamber unable to reach agreement, a second Conciliation Board was established. In what turned out to the critical turning point for relations between capital and labour in the mid-1970s, the Chamber indicated that it required certain concessions regarding additional duties to be performed by black 'artisan aides' in order to offset increased costs and production losses, concessions the Artisan Unions in the Council described as 'suicidal sacrifices', whereupon they withdrew both from the Conciliation Board and the demand for a five day working week until 'a more propitious moment' (Franzsen 1977:21). At the same time the industry sought to improve the 'efficiency' of African labour by increasing contract length and reducing turnover (Davies & Head 1995:4). Labour time, as before in the record, remained clearly tied to the racialised social form exploitation assumed in the organisation of production underground.

What is clear is that the five day work week finally negotiated between the Chamber and the MWU had to be accepted by other organisations representing organised white labour. At this point in the mid-1970s, with stringent conditions relating to the industry's insistence on the 'the total re-organisation of production' and consequently implicating the racialised social relations attending the organisation of work underground, the artisan unions baulked. Black artisan aide training had started in earnest the year before, opening

up new opportunities for job advancement and enhancing the occupational status of black mineworkers, thereby creating a new intra-working class occupational differentiation among black workers, and threatening the livelihoods of the white artisans (MacMurray 1978:22). The value of the labour-power of black workers was again the central issue. This time, however, this related to introducing a measure of artisanal skills into the black working class.

As the MWU, the Council of Mining Unions and the artisan unions had withdrawn from the Conciliation Board, this board then lapsed. The MWU continued to press ahead without the artisan unions for the implementation of the 24th November agreement. The Chamber then backtracked, indicating that:

> … it had never visualised a situation where a major proportion of the union men would opt to continue on a six day week as at present while members of the MWU worked a five day week and that this created problems of such magnitude that the industry could not agree to the introduction of a five day week on those terms (Franzsen 1977:21).

The Chamber cited the clause that 'agreement with other mine employee organisations,[104] a condition of the 24th November agreement, had not been secured. It was thus that part of the white working class Davies (1979) is accused of ignoring, the skilled artisan unions, who broke ranks in this generation-long struggle (Richardson and van Helten 1982:84).

Early in 1976 the MWU formally demanded the introduction of the five day work week by 3 May 1976, failing which application would be made for a further Conciliation Board. This board was duly established, and deadlocked at the first meeting. The date, by a strange twist of fate, was the day Soweto exploded: 16 June 1976. The deadlock resulted in the establishment of the Franzsen Commission, a direct result of the Prime Minister promising its establishment on condition the MWU withdrew their option to go on strike over their demand for the five day week.

[104] In 2004, as the final chapter of this thesis will show, the same constraint, that everyone on the mine had to agree to working-in additional time, was faced by the rock drill operators in their struggle over a working time issue.

4.3.8 Anticipating a longer working day: 1972

A note regarding research conducted by the Chamber of Mines Research Organisation (COMRO) on the effect on black workers of a longer working shift, as the industry anticipated a shorter working week, is appropriate at this point. The significance of this industry-based research is the assumption that underlies it: no reduction in the number of working hours overall was anticipated. Instead, the same number of hours was to be redistributed over the working week.

There can little doubt that the research conducted in the early1970s (Wyndham 1972; Johannes 1974) was due to the agitation of the MWU, who had been campaigning for a five day working week since 1947. COMRO needed to test whether black workers could sustain productivity levels during the longer shifts that would arise if organised white workers won their central working time demand. Investigations hinged over whether the then current production levels achieved in a six day week could be maintained over five longer working days. For this would impact on the productivity of production labourers, implicating the intensity of the application of African mineworkers' labour power, their disenfranchised status and lack of freedom of association notwithstanding. Could the established traditions of mining work representing socially necessary labour time - the average skill of the average worker with other conditions being fixed - be maintained in a longer working day? Only five years later does it appear the industry would realise that maintaining production was not, it would argue, a function of the *number of hours* worked per week, but rather the *number of days* worked. This hinges on the matter of the 'task' orientated character of the 'support, drill and blast' cycle underground and 'lost blasts' in the underground production environment, which receives attention below.

The issue of the impact of the length of the underground shift had previously been investigated in 1965 (Morrison *et al* 1965). The research focused on the probable physical effects 'of an extra hour's work on physiological strain and heat stroke risks' and found that an additional hour's work did not adversely affect acclimatised labourers, but that

'indications are that production during the extra hour's work would be the lowest during the shift' (Morrison *et al* 1965: no page number).

A later research project tackling the same issue, entitled: 'The possible effects on productivity and heat stroke risk of a longer working shift' and conducted by CH Wyndham, at one time head of the Human Sciences Laboratory of COMRO, had as its first sentence: 'A longer, daily shift underground in gold mines is likely to follow the introduction of a five-day week in the gold mining industry' (Wyndham1972:i). The important (current operational) limit of 32.2 degrees Celsius (wet bulb) appears to have emerged out of this research, beyond which a rigorously sustained working shift of five to six hours threatens to result in heat stroke.[105]

Meanwhile, black mineworkers continued to work long hours. Not all workers in fact were sure of what the much expected five day working week would bring, some workers fearing that a wage cut would accompany a five day week (Moodie 1975:19). It was certainly held that working hours were longer in mining than in secondary industry (Parsons 1977: viii). In 1976 '… the average black mineworker spent just over 10 hours travelling to his working place, working and returning to his hostel' (Allen 2003b:35). This is a sixty hour working week. Another source suggests the majority of men were on a shift of nine hours, with a 'substantial portion' of men working a 12 hour shift (Horner and Kooy 1980:4). This would make a working week of anything from 57 to 72 hours. Zambian copper miners may similarly have been compelled to work 12 hour or longer shifts at the time (Burawoy 1972b:248).

Whether known or unbeknown to the Chamber's researchers, the additional hour in the experiments testing the impact of longer daily working hours still fell short of the actual

[105] Twenty-seven years later, despite brattices being left open in very deep mines (below 3000m), except when the ventilation broke down and we all fled the stopes and there was no time for taking measurements, my hydrometer never showed this maximum permitted temperature in areas where mining was taking place. When this temperature was exceeded - hydrometer or not - we fled (see Appendix II).

working hours of the labourers being tested. The significance of the research was the hidden assumption that the industry did not anticipate that the five day work week would involve a reduction in working hours. A number of questions relating to the relation between working time and production levels were, however, to be raised in an important report prepared for the Chamber in preparation for the Franzsen Commission. This report serves to emphasise the point just made: production levels directly relate not to the number of hours worked, but the number of shifts worked per week.

4.3.9 The Franzsen Commission: 1977-1978

In 1978, after over 40 years of campaigning for a five day week, the Mine Workers' Union and other artisan unions finally permanently settled for the industrial working time arrangement of the Eleven Shift Fortnight (ESF) (Visser 2008:211)[106] in the wake of the Franzsen Commission. This was a compromise between mining capital's preference for maintaining the six day week[107] and the five day week preferred by organised white labour. Having been a member of the Commission and having failed to secure the five day week, the General Secretary of the MWU, Arrie Paulus, rejected the eventual outcome and was criticised in trade union circles regarding the strategy the MWU adopted in this struggle. Its introduction was the cause of 'bitter dispute'[108] between the Chamber of Mines and the MWU (de Vletter 1981:112). This shift system was to become something of an industry standard. Hours worked on platinum mines in 2005 would be

[106] The demand for the eight hour day, while not co-terminus with the five day or 40 hour work week, goes back to the aborted Volksraad Bill of 1899 of Paul Kruger's Transvaal Republic.

[107] The industry would really have preferred 'rostering', i.e. continuous work schedules, despite acknowledging the 'onerous' administration such arrangements require (Chamber of Mines 1978).

[108] The extent of this dispute centered on the most far-reaching change in working time arrangements in the century since 1911. Fion de Vletter reported in 1992 that the MWU held that the 45% increase in mine profits in the second quarter of 1978 was at least partly attributable to the implementation of the ESF - presumably as men had time to recover and were more productive. The Chamber, on the other hand, apart from noting rising costs, indicated that productivity had decreased by 6%. It is difficult without more detailed investigation to square these hugely conflicting claims. More to the point is the scope of the implications of changing and restructuring working time arrangements.

96[109] hours every two weeks, as stipulated in the Mines and Works Act (Franzsen 1978:44), but averaged over two months.

The ESF is a five-and-a-half-day work week, with two Saturdays worked every month. This changed the arrangement of hours of the working week, but did not reduce the number of hours worked. The Commission found that the eleven shift fortnight:

> …was as far as the industry could go to accommodate the aspirations of white mineworkers, with no reduction in working hours (Lewis 2001:14).

The Commission considered that the industry move 'at some point in the future' to the shorter working hours of the five day week, but which has been largely ignored in the industry (Lewis 2001:14). To this end, the Chamber, as ever, had conducted its own investigations, and was subsequently to make as precise a set of calculations as possible. A particular set of social concerns must surely have framed the deliberations of those whose job it was to prepare the report to the Commission. It had been established that 'Bank to bank time appears to be an area of growing concern among Black mineworkers' and that 'Not only is the time considered unduly long but is compared unfavourably with secondary industry'.[110] The possible strategies for improving this situation amounted to re-evaluating hoisting procedures and providing 'some compensatory reward', but 'not necessarily monetary', despite the finding that workers expected overtime pay for time spent at work 'in excess of the normal shift' (Parsons 1977: 26, 54). There was no mention of the possibility of shorter working hours.

[109] In 1978, 92 hours were worked over 11 shifts of equal duration (Chamber of Mines 1978:99). Coal miners were working 107 hours 'bank-to-bank' (Franzsen 1978:44).

[110] The mining industry was concerned about how black mineworkers compared it to that of the manufacturing sector, COMRO having produced a report entitled 'How attractive is gold mining to black mineworkers?' the previous year (Parsons 1978) as well as having produced another earlier in the same year entitled 'Factors affecting the popularity of a mine for black mineworkers' (MacArthur *et al* 1978). This study, followed a previous report also produced the year before, was entitled 'Why are mineworkers staying for shorter periods in gold mining?' (Robertson *et al* 1976).

That the five day week, however, seemed a real prospect at the time is reflected in the government's 'Report of the Inter-Departmental Committee of Inquiry into Riots on Mines in the Republic of South Africa' which curiously did not want 'to deny the Black worker his five-day week, for he works long and heavy shifts and, after all, earns his weekend recreation' (Cited in Horner and Kooy 1980:15).

4.3.10 The Gold Project Team: 1978

Taken at face value, the Chamber's 'Gold Project Team' report[111] provides a clear indication of conditions constraining the continued profitability of gold mining. The 'Final Report' of the project team appointed 'to investigate the implementations and effects of the eleven-shift fortnight in the gold mining industry' is entitled 'Eleven-shift fortnight/Five-day week'. This very detailed report - deserving of considerably more attention than is possible here - which explored all possible working time arrangements available to the mining industry, echoes the current contemporary struggle over alternative shift arrangements and permits a comparative analysis of convergences and divergences with experience a generation later on the platinum mines.

The working time of black mineworkers was shown in earlier periods to have been linked to that of white miners. In 1978 black mineworkers were still disenfranchised, without the freedom to associate, were not party to the negotiations, but were central to production. In a similar way, the effects of the eleven shift fortnight (ESF) impacted on both their working and social lives. The industry was fully aware of black workers' rising aspirations and 'rapidly developing socio-economic needs' (Chamber of Mines 1978:2). Given the then racially informed legislative framework, any arrangements concluded with white labour would inevitably impact on the rest of the workforce and consequently on productivity and profitability as a whole, as we have seen Johnstone to have noted.

[111] Access to this report in 2003 perfectly fits how Allen described the case regarding the Chamber of Mines archives in 1991; 'All of its non-published records have a restricted circulation and cannot be seen without special authorisation. Those which have been commissioned by specific mines on a consultancy basis are issued only to the mines concerned' (Allen 1991:18).

The Chamber's Gold Project Team report (with only key points noted here) was a detailed comparative cost/benefit analysis which emphasised that:

> … it must again be stressed that the investigation was done purely from a mining engineering and management point of view and as such concerns itself only with those issues that are relevant to the continued running of the mine (Chamber of Mines 1978:2).

The specific objectives of this very thorough report were both extremely broad ranging and highly specific. These were to:

> … determine the industry's preference for hours of work, to quantify the effect of different options on production and costs, to determine what changes in work practice are necessary under present legislation, to apply these to the different options and to gauge the effect on relevant issues and to assess the suitability of different options on varying conditions on individual mines, to recommend alterations to present legal structure and definition, *to theoretically re-structure the total organisation* and determine the effect of such change on relevant issues and to plan and schedule the introduction of new work practices and changed hours of work to enable a smooth and manageable transition to take place (Chamber of Mines 1978:1-2) (my emphasis).

The report considered the following working time arrangements as options: a return to a six day week, staying with an 11 shift fortnight and all of its possible modifications, working a Monday to Friday five day week, various rostering methods, working a five day 'man-week' and a six day 'mine-week', and working a five day 'man-week' and a seven day 'mine-week'.

In its synopsis, the report was emphatic that:

> In order to maintain production it is quite clear that the mining industry must revert to mining on 6 days a week. This concept immediately cancels the option of a 5 day week which leaves no legitimate way open for operations on the sixth day. All the other options are open to the industry provided that the concept of rostering of labour is accepted. In point of fact *the only alternative to rostering would be working six days per week with compensation of some kind for example extended leave privileges* (Chamber of Mines 1978:A) (my emphasis).

That working time relating to leave issues had long been used by the Chamber as a bargaining tool with labour is but noted again here. That working time was the critical issue is more to the point, for as reported: 'The Industry would also have to face the fact that declining productivity indices are unavoidable under any system where labour works less than 6 days per week'(Chamber of Mines 1978:A). Labour time and productivity, and by implication value and profits, remained indissolubly related. Maintaining the number of days worked per week was critical to ensuring the number of blasts achievable, upon which the maintenance of then current levels of profitability depended. The number of blasts - the key productivity index - this report now recognised, relate not to hours worked per day, but days worked per week. Arguments around such production issues reverberate a generation later in the platinum mines, of which more will be said later in this study.

The report is dominated by 'concessions' that white labour would have to make and the legal implications of such concessions. What is of particular interest is that this was integrally related to the racialised roles in production underground and the hoary old problem of transforming social relations underground (Johnstone 1976; Legassick 1974b, 1975). Re-organisation of production meant extending the role of the Team Leader's responsibilities, such as charging up, examinations of sweepings and shaft examinations, marking holes, drilling and blasting ore pass blockages and entering the panel before the arrival of the miner.[112] The reason why it was not as important to reduce the costs of white labour as the tradition has it, but rather curtail and end their direct racialised control over production, was the necessity to increase the intensity of African labour power, by reducing their waiting time underground in the stopes and development ends or, in other words, to reduce their unperformed surplus labour time, *a la* Wright's (1981:67) schema. Re-organising this series of activities is tantamount to re-organising the entire labour process - hence an objective of the report to 'to theoretically re-structure the total

[112] From a series of COMRO research reports (e.g. Fone 1985) with stope production team leaders ('Boss-boys'), with working time stable, social relations *in* production become the focus by focusing on improving supervision and hence the intensity of work by non-mechanised forms of relative surplus value extraction. The shift from a 'unitary' to a 'pluralist' industrial relations stance, however, was swiftly to follow (see O'Donovan 1985).

organisation'. Ironically, none of these issues had an impact on that section of organised white labour, the artisans, who scuppered the joint unions struggle for the five day work week. For as we have seen, while the industrial unions were prepared to accept further dilution of their power (noted in detail in the 24th November letter and a point much discussed in the literature), the artisan unions were not prepared to share their considerably more substantial set of skills across the racial divide.

Race did, however, continue to dominate. No mines were prepared, for instance, to recommend that organised white labour concede to permit the employment of black onsetters,[113] notwithstanding that this job had been mooted for racial re-organisation 50 years before around the time of the 1922 General Strike.

It is consequently merely registered here that, in minutes appended to the report at the time, the matter of working time arrangements (11 shift fortnight/five day work week) and the restructuring of work underground (white supervision/team leader blasting certification) were regarded as 'inextricably bound up together and should be dealt with together' (Chamber of Mines: Gold Project Team Minutes 13 June 1978:2). This stance was to become standard practice.

What is further notable about this period is the similarity of the issues the MWU raised in the 1970s and those raised by contemporary unions and staff associations a generation later, including the manner in which they are expressed. While the Franzsen Commission, as noted, recommended shorter working hours 'at some point in the future', it did not and could not anticipate the development of the period that followed, a tumultuous time initiated with the Wiehahn Commission the following year, which finally recommended the recognition of trade unions for black workers, thereby initiating the transformation of work and power relations underground. While Michael O'Donovan had suggested, 'in some sense black mineworkers had 'matured' in the intervening period', his own better

[113] Onsetters control the hoist and were formally called engine drivers, as noted above. This has since changed, with women being the latest entrant to the job, hence across not just the racial, but also across the gender divide.

explanation is that what had prompted the Chamber to move from a unitary managerial perspective to a pluralist one, was that 'the relevant variable is probably the objective position of black miners in production' (1985:82-3). More specifically, not only was the nature of the 'objective power' of black mineworkers, due to their *de facto* skilled role in production, the relevant issue, but so was the necessity of introducing black artisanal skills, both matters implicating the value of African labour-power. The value producing capacity of the labour time of these workers had, again, to be enhanced if the temporal demands of white workers were to be entertained. Investigating the feasibility of implementing these demands, other considerations aside, was revealed as not being possible without reorganising production as a whole. This, however, was in turn not possible without changing the legal status of black mineworkers. An important implication of all this was that the dramatic shift in the industrial relations framework, from a unitary to a pluralist perspective, had, consequently, at its root, from the industry's point of view, the under-utilised capacity of the labour-time and hence the (uneccessarily) high value of the labour power of the new post 1971 generation of black workers as reflected in the then recently increased mineworkers' wage packet. The capacity of their labour power had to be freed up at the same time white workers were pressing for reduced working hours.

Neither could it be foreseen in 1978, when Franzsen envisaged shorter working hours 'at some point in the future', that the industry would, for the first time ever, operate under conditions of a falling gold price, its lustre dulled as its role in the national economy steadily diminished (Jones & Inggs 1994:8).

4.3.11 The Eleven Shift Fortnight: 1978-1991

In what is a period of extreme flux and major social change, a few short years after 1981, when the NUM gains partial recognition, and the mining labour force is massively reduced in the wake of the 1987 mineworkers' strike, the union is forced to recognise the question of productivity. Incidentally, during the strike the NUM shrugged off the Chamber's only substantive offer, one that had historically served them well when negotiating with organised white labour: an increase in the holiday leave allowance,

which was not, Dunbar Moodie tells us, part of the dispute (2009). With the young organisation under immediate threat, working hours do not appear to have been on the NUM's agenda in this year, although the Congress of South African Trade Unions (COSATU) had called for a 40 hour working week, without loss of wages, in its living wage campaign (Lundall 1990:69).

By this time the migrant labour contract was shortly to align with industrial working time and the foundations of a permanent labour force, 'hired at the gates of the mine', had been secured, with The Employment Bureau of Africa (TEBA) no longer recruiting labour, but focusing rather on streamlining its bureaucratic procedures to 'reduce the number of working hours lost as men are processed' (Davies and Head 1995). The silence in the secondary record over these years invites further investigation, the changes wrought by the eleven shift fortnight, which becomes the standard working time arrangement, becoming untenable in the face of resistance on the platinum mines within fifteen years. The resulting changes in working time arrangements, after decades of almost static stability in working hours, proved to be far-reaching.

4.4 Years of transition: 1991-2006 and into the present

4.4.1 Working time arrangements: 1991-2000

There are three sets of working time arrangements in this period: the eleven shift fortnight (ESF), the five day working week and continuous operations - or Full Calendar Operations (Fulco). There is a useful account of the opening to this period worth briefly recounting here (Lewis 2001:18-23). In 1991 the NUM initiated a Mining Summit to address the crisis in the industry (Nattrass 1995:170-1; Crush *et al* 2001). Together with the Chamber and the Department of Minerals and Energy (DME), a seven day cycle was recommended by a working group whose full calendar operations (Fulco) technical appraisal was tabled late in 1992 (Lewis 2001:18). Within months, early in 1993, the NUM Central Committee declared the union's aim to win a five day week. By 1997, however, 20 mines were working a full calendar working time regime (Crush *et al* 2001:8).

A wide range of rotating, continuous shift schedules were implemented, breaking the stability in the working week of the previous almost nine decades, with Sunday blasting shifts beginning in January 1993 at marginal mines (Lewis 2001:19). Multi-blasting schedules were adopted, mainly in development sections, in other words not at the stope face, the heart of production in mining. Exemptions for Sunday work were granted from January 1993 (Lewis 2001:19). This too broke a legally enshrined, worker-won tradition set in 1911, which was - as we have seen - only implemented some years later.

After a long period of stability regarding working hours, this period then - at the point that the NUM took up the issue of productivity under the leadership of Cyril Ramaphosa - initiated the contemporary period in the history of working time arrangements, characterised by experimentation and transition. As the introduction of continuous work over seven days dominated the attempts to re-establish the stability in working hours, Fulco assumed the focus at the outset of this contemporary period.

With the dramatic fall in the gold price in the early 1990s, the NUM entered a series of path-breaking agreements with the Chamber of Mines. Wages and wage increases were tied to the economic performance of the gold-mining industry (Nattrass 1995:170). After stability since 1911 and the single change to the configuration of the working week after the Franzsen Commission, working time arrangements temporarily moved instead in the opposite and a more complex direction.[114] Lewis (2000:1) suggests three major organisational changes in mining took place in this decade, the 'change in the arrangement of working time, such as reductions in standard working hours and the use of new forms of shift schedules' being one.[115] This typically included 'the introduction of

[114] Lewis suggests that the outcome was 'more heterogeneous than Franzsen predicted' (2000:7). By way of evidence, Lewis found that of the 17 gold mines that responded to his survey, nine worked the eleven shift fortnight exclusively, another two in addition had introduced Full Calendar Operations (Fulco) for a part of the workforce, while six mines worked Fulco in the main underground production schedule, alongside the ESF for engineering and maintenance crews, suggesting that all the mines continued to have some form of ESF arrangement in operation (2000:2).

[115] The other two major changes are the use of subcontracting in underground work and the

additional shifts or the introduction of Full-Calendar Operations (Fulco)' (Bezuidenhout 1999:9). Various five day work week arrangements, ESF modifications and the seven-day mine-week, signalling continuous operations and accompanying shift arrangements, were introduced. Working time for the individual worker varied from 40,7 to 52,2 hours a week (Lewis 2001:28-9).

This change in the measure of time, from the 'man-week' to the 'mine-week', implemented on some mines, was a fundamental break with the past, signalling the separation of labour and time and the association of labour time with the individual worker. Henceforth, in the relation between capitalist production and labour-power, time *per se* threatened to become abstract and a new terrain of struggle open up. For the institution of a 'timeless' production process, with time in a sense removed and 'disappearing' from immediate sight, as a measure of the value of individual labour-power due to it being continuous, occurs within a still relatively primitive production process in a developing economy, at least as far as production in the stopes is concerned. The attempts at instituting continuous operations would prove to be short-lived.

The point is that a wide range of full calendar operations (Fulco)[116] were prompted when wages were linked with productivity, in other words, with the restructuring of the value of labour power overall. The fairly numerous attempts to introduce new working time arrangements have, however, remained largely of an experimental nature, with the industry in the main, in contrast to Lewis's prognosis a decade ago, appearing to fall back on the eleven shift fortnight (ESF), but not without continuing experimentation in seeming fits and starts with continuous mining operations on some mines.

After a false start in 1991, working time and productivity agreements have, particularly since 1997, been strongly associated. Such agreements, echoing the Chamber's earlier

increasing use of bonus incentive schemes.

[116] The term 'continuous operations' or 'Con-ops', has replaced the nomenclature 'full calendar operations' or 'Fulco'.

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report, were expected to improve productivity at the rock face underground. Linking productivity with wages and performance and related issues of work organisation, it should be noted, had been acknowledged by the NUM as 'uncharted' industrial relations territory (Bezuidenhout 1999:12). In addition, some managers were equally unprepared to forego what previously was their sole prerogative in the opinion of the deputy general secretary of the NUM Archie Phalane (Bezuidenhout 1999:12). These managers were reluctant to give up the one area over which the industry had historically exercised direct and consistent control, the significance of which attracts discussion below.

These attempts to lengthen the mine-week to its maximum temporal limit concerned improving capital productivity. The hope of the industry was that 'Full-calendar operations would allow 25 percent more blasting shifts per month' (Crush *et al* 2001:8). Nonetheless, this was argued as necessary to *sustain* production (let alone improve it), by the Chamber in its submission to the Franzsen Commission. This was initially met with union agreement and even worker enthusiasm as shorter working hours for the individual worker were anticipated. Workers' actual experience of working irregular hours, however, fairly soon ran into sustained organised worker resistance across the racial divide when it became clear that individual workers did not end up reaping much benefit from the new temporal regime and that, more importantly, social life for workers in general, of whatever racial hue, was significantly disrupted.

Research conducted by the NUM at the beginning of this period showed that 70% of black mineworkers were still working between nine and 10 hours underground (Leger & Nicol 1992:20). This worked out to between 45 and 50 hours inside the week, excluding every second Saturday. Given further that work still takes place every second Saturday, a true half day for white workers and mine officials, but in practice more like a three-quarter or even often a full shift for many black workers,[117] this resulted in a 53 to 58 hour working week or, even where black workers do work only 'half day' Saturday shift, a 50

[117] On platinum mines, black workers, working often very largely unsupervised on Saturdays, complain about the increased safety risk with no 'whites' to appeal to in the event of technical, organisational and other problems.

to 54 hour working week.[118] These hours are similar to those worked by one Mkize a few years later (Meel 2003: 14). This is a legal, longer working week than in 1911. Implementations of the five day working week began to occur as international shift schedules moved to a standard 45 hour working week, but where many mineworkers remain underground for 48 hours and longer from 'bank to bank'.

By this time the majority of mineworkers were professional career miners, going home for set leave periods (Cobbe 1995:153) and subject to the rhythms of every second Saturday off. Relatively few workers were and are, however, in a position to go home on their off weekends, the long rows of taxi ranks outside the shafts and the bustle every weekend nevertheless signalling a significant break with past practice. Even under Fulco, with two, three or four days off at a time (often mid-week), it is unlikely these working time schedules had 'significantly increased the contact between migrant workers and their families compared with the 11 shift fortnight' (Lewis 2001:33).

4.4.2 Full Calendar Operations (Fulco): 1991 to the present

Despite the essentially *unsatisfactory* results of the implementation of Fulco, Lewis and Wegner (2000) had previously suggested that the traditional eleven shift fortnight 'has been largely replaced by the five-day week or by 'full calendar operations' (Fulco)'. A decade later, however, it is not clear that this is the case.

While a number of innovative shift arrangements were implemented during this period, few outside the collieries appeared to have been sustained in the long term. A senior manager ascribed this to the fact that attempts at full calendar operations during this period were only implemented in mines that were either marginal or faced severe economic constraints. Fulco, it was suggested, was essentially a last ditch attempt to rescue ailing mines. The association of the failure of Fulco with these attempts had been responsible, it was held, for the general conclusion that such arrangements are not

[118] Saturday shifts often start an hour earlier in order to get a full eight hours of work in. Many white supervisors either do not go underground or literally pop down for anything from two to four hours to attend to any pressing issues.

sustainable. Such arrangements have clearly been a preferred option for large segments of the gold mining industry for a long time and have been successfully resisted by working class communities. Yet where they were implemented, such as on the Free State goldfields around Welkom, they have failed, with workers, both black and white, simply refusing to work once underground.[119]

4.4.3 The Basic Conditions of Employment Acts

The Basic Conditions of Employment Act (BCEA) of 1997 (and as amended in 2002) consolidated a series of previous legislative measures, and introduced a working week of 45 hours, which could be 'averaged' over a period up to four months. Productivity agreements were again tied to wages in 1997 Chamber negotiations. These negotiations resulted in further working time experiments.

The first BCEA-legislated limits to working time included the following: eight hour shifts within a 45 hour week, a five-shift week with a single shift of not more than 9¼ hours, and permitting 'continuous process workers' to be called on to work 144 hours within a three week cycle with an eight hour break between shifts (Adler 1991:26). This constitutes a quick shift change-over which international guidelines suggest be eliminated. By way of example, coming off afternoon shift at 10pm on a Sunday night and starting morning shift at 6am on Monday morning is to be avoided in working time arrangements. The echoes of the struggle of 1913 and the late Saturday shift change-over to the Sunday shift resound down the twentieth century and into this one. Time spent working underground, where the stope face cannot be fully mechanised,[120] has become more intense, applying now with greater vigour to not merely sections, segments or racialised fractions of the mining working class. The assertion that 'a shorter working week (at the most forty hours) is essential' is even further away than when it was made (Leger and Nicol 1992:27). Whereas workers in the United States across all sectors worked 1 978

[119] Richard de Villiers, a long-time Personnel Director, personal communication, March 2011.

[120] On collieries where the rock face has been fully mechanised, five day work weeks are fairly common.

hours a year (Berg *et al* 2004:333), even given a strict forty-eight hour working week, often not adhered to, mine workers work 2 248 hours per year where a full month is taken for leave. This amounts to an additional five working weeks over a calendar year.

Continuous operations initiate the contemporary struggle of the combined forces of a previously racially divided labour movement, formally sharing the same hours and conditions. Labour now engages a struggle to maintain the same configuration of social time as the rest of society. Odd and irregular hours have never been a popular way to work. As early as 1895, for instance, a group of Shona workers refused to work a night shift as this was not covered in their original labour agreement (Phimister 1976:10). For working odd hours - having to treat Wednesday and Thursday, for instance, as your Saturday and Sunday weekend is extremely inconvenient and disrupts the rhythms of social life.

The working class on the platinum mines, irrespective of skill or race or length of service, are currently resisting this process. You cannot watch big rugby or soccer games; you don't know who might be visiting your wife in the middle of the week; hostel life on your 'off' days is even more miserable, and your life's pattern is either not synchronised with your family or you are without them as usual when you *could* be, still trapped, but now in a highly irregular pattern, breaking old working habits and ways of being. The social time of this segment of the working class is now threatening to become 'desynchronised' from the rest of society (Glorieux, Mestdag & Minnen 2008:65). This is being resisted. The issue of time, albeit within currently occluded struggles of workers in the post-colonial context of gold and platinum mines, consequently rises on the agenda of socially pressing concerns.

4.5 Conclusion

The number of hours miners and mineworkers work per week has not changed appreciably since 1911 and has, if anything, lengthened in certain instances. The single change wrought by the Franzsen Commission in 1978 altered the shape of the working

week from six to five and a half days. The Commission did not reduce the number of hours worked, but instead lengthened the working day. Working hours later became averaged over a maximum of four months; on a leading platinum mining house, as will be seen, 96 hours are averaged over two weeks. In the vast world that is mining, numerous exceptions will doubtlessly be found. I certainly worked a strict eight hour shift bank-to-bank for three months on what was then the deepest excavation on earth. As has been intimated, the struggle over the length of the working day for all workers has shifted to the struggle over the length and shape of the working week. Before examining this shift in the struggle to which all workers on the mines remain subject, the labour contract to which African workers were, in addition subject, played itself out over months and years and it is to this special measure of labour time, and the way in which it progressively lengthened over almost a century, to which this work must first turn.

5 Shifts and the labour contract

> *'In their efforts to secure more work out of each period of service, the NRC and WNLA adopted two strategies: "the aim has been to keep the Natives at work for the longest term possible and also to induce them to return to the mines for further periods of service for as large a number of tours as possible" (Memorandum on Shortage of Native Labour in the Gold Mining Industry, 19 February 1954)'.*
> Cited in Jonathan Crush (1992b:53)

5.1 The migrant labour contract as a measure of labour time

Time is experienced, conceived and measured in manifold ways. In addition, the very measure of labour time qualitatively structures social life, including the way in which time itself is treated and in this instance, presented. For in this chapter, the cue for construing labour time as constituted and measured by the length of the labour contract was taken from the African Mine Workers Union (AMWU) submission to the Lansdowne Commission in the 1940s. The AMWU argued that the whole time of the migrant labourers' contract was effectively 'working time'. This conception of labour time effectively collapses the distinction between labour time and leisure, disposable, 'off' or 'free' time. For the AMWU, time spent 'working underground' and time spent 'at leisure' in the migrant labour compounds was all part of serving the migrant labour contract - and hence constituted working or labour time.

This view of labour time strengthens the suggestion made in previous chapters that the concept of labour time is an independent conceptual variable identifying the quintessential material force responsible for the fundamental social structuring of human affairs. The length of the migrant labour contract is, moreover, like industrial working time, an identifiable measure of labour time expenditure and subject to close analysis, although not as closely as in the previous chapter by dint of the fact that the length of the labour contract is a looser measure of time than that of industrial working time. Its ramifications are, in addition, considerably wider.

In what follows here, the construal of the labour contract, as a measure of labour time, is adopted as a guiding conceptual category for re-reading the secondary literature. It is also used to try and understand the impact of labour time, *qua* social phenomenon, when employed in this broader, seemingly all-inclusive sense. The picture of working and social life viewed through this perspective of labour time, by dint of its looser quantitative measure, consequently becomes considerably more complex. Even more clearly than illustrating the social impact of the conventional notion of industrial working time, which measures the part of the day spent at work in an industrialised society, time spent serving the labour contract, as articulated by the AMWU, represents the most complete social form the collective production of a social surplus, as the alienated creation of value under capitalism, can - beyond actual slavery - assume. For under the discipline of the labour contract, the virtually complete subsumption of the whole time of a compounded migrant worker, including non-working, 'leisure', 'disposable' or 'free' time, takes place. The extent and length of this labour contract is hence of critical importance in understanding the importance to the mining industry of this phenomenon. The question which arises is why the labour contract in South African gold mines progressively lengthens over a century and is only ever shortened in the context of a shortage of labour or to attract migrant mineworkers back into wage labour? While this chapter will provide a direct response to this question, the range of closely related issues and matters this raises range broadly, only some of which are briefly noted and are not treated in the depth they deserve and point to the sustained and programmatic research required to provide a fuller answer.

Taking the labour contract as a measure of labour time, this chapter has as a major focus the paradigm case of compounded Mozambican mine workers who eventually ended up working set minimum 12 month length migrant labour contracts. These labour contracts were initially longer until the State limited what will be seen as a unique form of forced absolute surplus value extraction applied over the oscillating migrant mine working labour force of the African working class as a whole. The contingent of the Mozambican workers' labour contract and its length was settled at the political level of negotiations between the Chamber of Mines and the Portuguese colonial authorities.

Though in less dramatic fashion and not over the same duration, labour contracts progressively lengthened in the comparative case of Lesotho, as they did in regions within South Africa at key points, especially from the mid-1970s onwards. Such lengthening of the labour contract across Southern Africa continued to occur independently of changes in State power over the past century.

The standard case of Mozambique, the instance of Lesotho and the contract of local South African workers constitute the focus in this introductory account of the gradually increasing length of the migrant labour contract. Intimately linked to the time spent serving this contract is the extent of the mineworkers' socialisation and acculturation into compound life and industrial discipline. The chapter will show how this temporally bounded socialising process powerfully contributed to the acquisition of the unique skills mining requires, permits a re-reading of the driving social forces behind proletarianisation, initiates the first social distinction within a previously undifferentiated mass of African workers and results further in intra-working class occupational differentiations. Once African workers acquired skills born of their labour expended over time and progressed in the emerging occupational hierarchical structures of the mining industry, this resulted in changed managerial definitions and perceptions of them within the industry. The upward movement of Africans within the industry further affected the relation between these workers and the echelon of white miners. This contributed - as noted in the previous chapter - to the importance of the value of African labour power which cast a long shadow over relations between organised white labour and the Chamber of Mines.

While the migrant labour contract lengthened overall, those of South African workers were shorter than those of other non-South African workers. The numbers of non-South African workers steadily increased until 1973, when they 'reached an all time peak of 80 percent' (First 1983:31). The oft-noted external factors of the Malawian air crash disaster in 1974 and Mozambican independence in 1975 - when these countries' labour was withdrawn from the mines - were then to change the numerical balance between labour sourced from elsewhere in Southern Africa and South Africa itself (Davis &

Head 1995). In 2000, the balance was about 50% for each (Lewis 2001:33). When South African labour was actively sourced from the mid-1970s and mine wages rose dramatically, albeit off a very low base (see James 1992:20), these contracts then lengthened.

The migration of non-South African or 'foreign'[121] contract labour had implications, it will be shown, for two other social phenomena discussed in this chapter. A small group of workers, the 'long service Africans' (and smaller groups of 'coloured' and Indian workers) at the turn of the twentieth century, continually repeated their contracts and distinguished themselves, by virtue of their time-worn skills, from the rest of their compatriots.

The labour contracts of non-South African workers also enables a fresh explanatory reading of the long, uneven and incomplete process of proletarianisation of migrant mine labour that took place. This is not new, yet potentially assumes new significance when seen in the light of the evolution of working time arrangements, not simply in terms of industrial working time measured by hours and days, but further in terms of the labour contract, measured in terms of 'tickets' or shifts worked, extending the number of days worked, counted in months and even years.

The point of beginning to collate the evidence of the gradual lengthening of labour contracts in the secondary literature is to signal the critical importance of the *retention* of labour, which has not attracted its due measure of attention. For instance, the historical roots of the lengthening the contract lie in the earliest days of mining in the diamond fields and institutional measures to control the length of the labour contract succeeded earlier (and were consistently sustained) than those attempting to control the *acquisition* of mine labour. The intention here is simply to show the importance of

[121] Ruth First (1983:245) tracks the changing definition of what she calls the invidious term, 'foreign' labour. The term 'non-South African' labour has been used here.

labour time as the conceptual prism through which a plethora of other matters are cast in a fuller light.

5.2 The migrant labour contract, circa 1880s -1980s

By way of introducing the critical role players in this narrative, workers from Malawi, Mozambique, Angola, Botswana, Lesotho and Swaziland[122] and further into Sub-Saharan Africa, served labour contracts on mines within South Africa. The resulting dubious fortunes of these societies mirror the export of labour whose contracts are stabilised over time. The singular case of Mozambique is central to mining capital's labour supply from the 1890s to 1976 where this can be clearly shown, albeit in roughly hewn form. In brief, the Mozambican contract is stable at a minimum of 12 months from the late 19th century into the recent present, despite the drastic attenuation of their numbers. In addition, the rates of desertion of recruits from Mozambique were consistently lower than for other workers even during the 'post-war peak' in the period 1907-1910 (Jeeves 1985:166). The making of the social class of the mining proletariat is directly related, I suggest, to the absolute numbers of migrant workers, but more importantly, to the length of the labour contract, for it is therein where the acquisition of the peculiar skills of mining are embedded.

Over nearly a century the labour contract of African mine workers gradually lengthened: from one, to two, to three and up to 24 months on the diamond fields in the early 1880s and later up to three years on the gold mines. Inherited from South American mines, the system of compounding labour in a centralised and controlled environment, generally

[122] Guy and Thabane (1988) suggest that ethnic generalisations, while reflecting 'minimal social insight', 'do have considerable social weight'. Crush *et al* similarly refer to the 'the mining industry's penchant for matching particular skill sets with particular ethnic groups' and which 'influences sub-contracting' (2001:12). Without further discussion, this view is adopted here when referring to workers from different geographical environments across Southern Africa. This view relates the behaviour and experience of different groups of workers to both the demands of mining technology and capital accumulation in the industry (Guy and Thabane 1988:259). Instances of this view can be found on the mines to this day.

with closed or restricted access, was established on the diamond mines, *inter alia*,[123] to physically restrain workers until they had completed their contract. The labour contracts framed by this environment, in general, take the better part of a century to settle around a length of 12 months.

The African labour contract then aligns with the yearly rhythm of industrial time organised white labour had secured: a 48 hour working week, annual paid leave and the recognition of public holidays. As the labour contracts of South African and non-South African workers eventually match the standard 12 month Mozambican contract length, and eventually coincide with the annualised rhythm of industrial time, the effective dissolution of the labour contract occurs. However, labour migration, as a system of the acquisition, retention and expulsion of workers, remains, whether migrant labour is conceptualised as 'commuter migrancy', 'inflexible migrancy' or viewed as the successful 'stabilisation' of labour and the emergence of the 'career miner' (see Crush & James 1995).

The alignment of industrial working time and the labour contract, however, lays the foundation for a new phase of capital accumulation in mining. There is a renewed focus on capital productivity via the extension of the mine-week.[125] There is, further, towards the end of the twentieth century, the emergence of demands by organised labour, while still organisationally distinct along racial lines, collaboratively to resist the introduction of continuous operations (and irregular working hours).

[123] The most common reason cited for the establishment of the compound system was to prevent illicit diamond buying (Turrell1982:45-46). This system of working class housing facilitated both the exploitation of labour and greater labour productivity. The latter reason points to the two chief reasons for the ever lengthening labour contract: the retention of labour, and the acquisition and development of necessary skills promoted by extended periods of labour time spent on the mines.

[125] The 'man-week' refers to the hours an employee works, while the 'mine-week' refers to the hours the mine operates.

Regarding the process of proletarianisation, for instance, scholars appear to be at one in using contract length as a key index of the phenomenon itself. The point is almost universally implicit in their work. This work goes further. It explicitly argues that working time is a key index of proletarianisation and notes analyses that begin to point in the direction of production, as opposed to issues around the supply of labour, its reproduction in the countryside and the impact on labour supplying States. Only a few commentators edge towards the importance of focusing on matters relating to mining production itself. Beinart (1980), for instance, will be shown to appeal to the patterns of proletarianisation (as opposed to urbanisation) and Spiegel (1980) considered earnings - directly related to contract length - as a key factor regarding the process of proletarianisation.

Ruth First shows that Mozambique accounted for 85% of all contract labour in 1905, which had dropped to 60% in 1908, but then remained stable until 1929. Wilson shows higher and a more complete set of figures for the period 1896-1969 (1972:70). The literature establishes the predominance of non-South African migrant labour until the mid-1970s, and it is to the way in which the labour contracts of these workers, and later those of South African workers, gradually but steadily lengthen, that this chapter now turns. This evidence is cited in support of the thesis that a more complete explanation of the exploitation of mine labour is revealed once viewed through the prism of labour time expenditure, here by taking the length of the migrant labour contract as its measure.

It is useful to apply this insight to resistance displayed in relation to the ‘loafer tickets’ issued to workers which extended the time they spent on the mine as van Onselen pointed out (1980). This applies equally to the lack of accuracy in marking-off work tickets or often not marking them off at all after a shift underground. These practices impacted on the length of the labour contract. The labour contract in effect consequently amounted to functioning as a flexible tool forcing migrant mineworkers to spend longer at the mine than the number of tickets or shifts for which they had been officially contracted. In numerous ways, the labour contract was stretched and extended unpaid labour time. The

labour contract then amounts to a unique form of absolute surplus value extraction, retaining workers on the mine and underpinning the already long working day black migrant mineworkers spent underground.

5.3 The labour contract

The spirit of the late 18th century Apprenticeship Contract in the Cape, reformulating conditions existing under slavery by exacting virtually complete control over the working time of the hapless apprentice, continued in later incarnations to breathe its influence on the working time arrangements of African labour. The labour contract defined conditions regulating working time by stating that the worker was:

> … required to work on every working day on day or night shift, on piece work or day's pay at the option from time to time of the Member by who he is employed, and when called upon to work on Christmas Day, Good Friday and on Sundays on work authorised by the government of the Union of South Africa. In addition, he is required to do overtime work as and when required (Cited in Allen 1991:246).

Fifty years later, the Agreement of Service of the Witwatersrand Native Labour Organisation's (WENELA)[128] equally hegemonic successor, The Employment Bureau of Africa (TEBA), required much the same of the employee who:

> … by affixing his left thumb or other finger impression to this Agreement and, if he so wishes, by signing it …'agreed that'… he will work on every working day to the best of his ability and, if called upon, will do overtime work and work on Sundays, Good Friday, the Day of the Covenant, Christmas Day and Republic Day on such work as is permitted under the laws of the Republic of South Africa (Cited in First 1983:232).

Such an employment contract establishes the material conditions for maximising surplus value extraction. Such a contract ensured a unique form of an absolute surplus value extraction regime enabling, in addition, the possibility of implementing strategies to extract relative surplus value from labour power. The labour contract exemplifies how

[128] The acronym is also rendered WNLA which form will be followed below.

Marx describes 'the tendency of capital' to combine these two forms of surplus value extraction:

> The tendency of capital is, of course, to link up absolute with relative surplus value; hence *greatest stretching of the working day with the greatest number of simultaneous working days, together with the reduction of necessary labour time to the minimum, on one side, and of the number of necessary workers to the minimum, on the other* (Marx 1973:770) (Marx's emphasis).

The consequences of signing a labour contract of this nature meant that the individual worker was 'caught in a web of bureaucratic and physical controls over his movements, his behaviour, and his body' (Crush1992: 828). Compliance with this contract consumed virtually the entirety of the miners' life and time while subject to such a contract, as Crush correctly avers.

The length of the 1928 WNLA labour contract, for instance, specified a minimum of 313 shifts for Mozambican labour. This number of shifts constitutes something of a standard and can be taken as another measure of industrial working time applying to all mining labour, although it is not used all that often. The number of 313 shifts also crops up with regard to the labour contract in general (Wilson 1972:73, 1976), while the number of 312 shifts is mentioned in relation to the working time of white labour (see Wilson 1972:48). This number of shifts technically takes roughly a year of continuous service to complete by working a six day week every week of the year. The actual amount of time migrant workers spent serving out their contracts on the South African mines was, however, as elsewhere, generally longer (Van Onselen 1980).

5.3.1 The diamond fields and 'free' labour: 1868-1888

Even earlier than the dates this work covers and regarding mining more broadly than gold and platinum, in the 1870s, when diggers shovelled and sieved the blue soil of the Kimberley diamond pipe, contracts were short, but working hours were long. Highly autonomous African workers would stay with a digger for a month or two, often moving

from digger to digger, staying in Kimberley for a two or three-month contract (Van Onselen 1980:130). Alternatively, workers would work from three to six months at a time, the longest period they were prepared to stay at work (Turrell 1982:50-5; Allen 1991:114). Diggers complained that a man who had agreed to work for three months would often summarily leave and engage with another digger without notice (Phimister 1976:7). Those who had walked 500 miles or more to get to the mines, the mining magnate-to-be Barney Barnato, being one of them, unsurprisingly, apparently tended to stay longer!

Many men were 'target' workers, going to work often for the sole purpose of buying guns. Men had to work periods of between four and 12 months 'depending on the type of gun they wanted to purchase' (Allen 1991:49). Very early, for instance, a triumphant group of Shona from Southern Rhodesia each returned with a gun 'for which he had been working for the past year' (Phimister 1976:3). Sheila van der Horst calculated that it could take between three and five months to buy a gun costing from five to eight pounds Sterling (1942). Allen argues that men 'behaved as if they were in a free labour market' and that on the early diamond fields, although a common labour contract was to work six 'tickets' of 30 shifts each, men would leave once the contract had served its purpose (Allen 1991:107).

Regarding the length of the contract, van Onselen makes the point that recruiters (and managers), among other strategies for lengthening the contract, *consciously* confused prospective recruits as to the difference between a 'month' and a 'ticket' - the latter taking longer than a calendar month to complete. Workers were also compelled to stay on the mines longer than they might have reasonably expected due to the issuing of the 'loafer ticket' (often noted in the literature) and other 'less subtle' ways of lengthening the contract: in short, a contract could take 'substantially longer' than for which the worker signed for by way of his thumb print, 'injury, illness or rest days' further playing a role in extending the length of the contract (1980:98). In greater detail, 'in 1909 a thirty day 'ticket' took on average forty-two days to complete and in 1911 it was estimated to take between thirty-five and forty five days' (van Onselen 1980:98).

Allen further contends that during this time men used 'the migratory labour system for their own ends' (Allen 1991:114), while van Onselen strenuously disagrees that there was any such 'free market' (1980:131). This matter aside, attempts at controlling workers' adherence to contracts, from 1876 onwards, all failed. Prefiguring what would later become established on the gold mines, the success of an attempt in 1881 to recruit men from Inhambane in Mozambique depended on offering a 12 month labour contract as opposed to a longer 18 or 24 month contract (Turrell 1982:59). The compound system would only come into existence three years later to provide the physical means of compulsion to ensure compliance with such a labour contract.

The assertion that the 'early pattern whereby men came to work for periods of eighteen months or less became entrenched on the gold mines' (Wilson 1972:6) will be shown, in the instance of 18 month contracts, to have only applied predominantly to one section of the labour market, the workers from Mozambique.

By mid-1884, workers would be marched into compounds and forced to stay there for six months. From 1880 to 1902 contracts were on average of two or four months' duration (Kallaway 1976: Table 2). By 1888, the compound system was prevalent throughout the diamond fields. Within four years of the building of the first compound, workers were incarcerated until they had served out the full length of their contract. However relatively 'free' this labour market was, on the diamond fields, for reasons powerfully attached to controlling labour time, it had come to an end.[130]

5.3.2 The 'long service Africans'

Shifting focus back to the gold mines, in treating the early period, 1891 to 1899, when it seems the majority of African workers were working contracts of three or six months' duration, Elaine Katz refers to these workers as 'short-term' workers (Katz 1999:75). There were, however, a small group of workers who differed from the majority and who

[130] With regard to the gold mines, Sean Moroney (1978:35) appears to date the end of 'free labour' to just after the South African War.

were described at the time as ‘long service Africans’ and ‘smaller contingents of coloureds and Indians’ who had earned this epithet by constantly renewing their contracts and had become semi-permanent on the mines, remaining for ‘continuous periods which varied from five to eleven years (Katz 1999:74). These ‘long service Africans’ became especially ‘boss boys’, generally having gained their overseer status on the basis of their longevity at work underground (Breckenridge 1988:688). Labour time expenditure, even in these very early years, represented a change in earning power and occupational, and, therefore, social status.

Earning slightly more than regularly contracted workers, but considerably less than white workers, the social significance of and degree to which this group of men were differentiated from other mineworkers, was due to the time they had spent on the mines during which they had developed mining skills. As far as the white miners protecting their racialised privileges were concerned, these long-serving African mine workers constituted ‘unfair’ competition (see Katz 1999:75) thereby changing already racialised social relations and shaping the form white working class struggle assumed. For as Burawoy correctly avers:

> … capital’s search for cheap labor power is not only compatible with white class struggle but is in fact the very basis for white class struggle. Without cheap black labor power, there would be no white class struggle over displacement (1981:328).

The length of time spent working on the mines by these ‘long service Africans’ (measured in years) enabled them to acquire skills, earn a wage above subsistence level and include a moral and historical component within it (see Chapter six) which consequently challenged the racial composition of colonial labour relations.

The extended period of labour time of the ‘long service Africans’, moreover, serves as the initial distinguishing factor within the African proletariat. Long service separates this small group of mineworkers from the rest of the collective ‘muscular machine’ that constituted the African mining proletariat. They were paid higher wages than their contracted African compatriots (Katz 1999:7). The value of their labour power, as a result of their skill obtained over time, was consequently greater than that of the general

African worker. This implication for the development of skills constitutes but the first of a series of organisational and social distinctions in production that reverberate throughout the structural fabric of society as this first division of labour within the emerging African proletariat assumes increasingly complex shape. To note but one example, longevity of service was a feature of the 'private black police and trusted indunas' who played an important role in 'the front lines' of the mines 'regimented labour system' (Jeeves 1985:181). The point here, needing more research, is that the extended labour time these men had spent on the mines enabled them to gravitate upwards into a new social status layer within the African working class, which often took the form of a labour-controlling and disciplinary function over their erstwhile mine working compatriots.

5.3.3 Setting the length of the Mozambican labour contract: 1896 -1909

In 1893 the Chamber of Mines made one of the first systematic attempts to satisfy the industry's labour needs (Bozzoli 1981:41). The role of the Chamber's Native Labour Department was to 'systematically organise the native labour supply' (Innes 1984:59). But without the political will and administrative and legal capacity of Paul Kruger's agricultural State, neither this, nor future attempts over the next 20 years, would meet with the desired success (see Wilson 1972:3). Often noted in the literature, this labour contract resulted from conventions in 1896 and 1897 and the 1901 *modus vivendi* agreement between the Chamber of Mines in South Africa and the Portuguese colonial authorities. That an upward drift of wages, particularly those of skilled African drillers, threatened the long term viability of gold mining is the received wisdom in the secondary record. Many examples can be provided. Already in 1896, for instance, two thirds of the Chamber's members had registered serious shortages of labour (Levy 1982:81). Conditions were being decried at the time as a 'mounting crisis in the industry' (Innes 1984:61).

From the mid-1890s, workers from Mozambique had a significant presence and, together with men from the northern Transvaal, constituted 77% of the labour force (Levy 1982:61). Mozambican workers worked twice as long as any other mine worker at this

point. The reliance of the industry on Mozambique is graphically illustrated by the fact that of the 98 000 workers on the mines prior to the South African War, 68 000 were from the East Coast (Levy 1982:91).

With the 1897 Transvaal-Mozambique agreement formally recognising recruiting for the mines, the contract of Mozambican workers was confined to 12 months (Jeeves 1985:187ff; Allen 1991:155). That an inter-State convention stipulated 'that no pressure shall be put on them to renew their contracts' suggests this was a common practice. When applied not to the length of the working day, but rather to years spent at work, such forms of absolute surplus value extraction, by definition, have definite physiological limits and clearly required State intervention in this instance. In terms of the 1901 *modus vivendi* agreement, this contract could be extended, it appears, virtually indefinitely. In 1909 the maximum length was fixed at two years. Contracts of longer than two years were clearly being served. The 'forced contingent' from Mozambique was relied on heavily (Kimble 1999:50).

The minimum 12 month contract was to become a standard, only to be generalised under very different conditions almost a century later. The years in between these agreements - 1901 to 1909 - had, however, seen the most concerted effort by far to establish control of labour via the length of the labour contract.

In brief, attempts at controlling wages through wage reductions occurred from 1890 until 1912 when the Native Recruiting Corporation (NRC) was formed. The regulatory role of the NRC in systematically acquiring labour in a fairly disciplined manner only came to sustained fruition, however, in 1919 (Richardson & Van-Helten1987:88-9). Jeeves (1985) provides the full account. At this point the problem of the supply of labour is inextricably linked to the length of the working day underground. For it was also in this year of 1919 that the working hours specified in the Mines and Works Act of 1911 were eventually implemented. In short, after interminable and acute shortages since the inception of gold mining, the ready availability of African labour may finally have enabled compliance with the legally promulgated shorter working hours.

What it appears, however, did already succeed in 1896 and 1897[132], despite 'disunity' in a then still 'ineffectual' Chamber of Mines (Bozzoli 1981:34-35), was that the 1893 labour supply institutions were accompanied by a policy and practice '… to standardise both hours of work and rations supplied on the mines (by introducing agreed minimum hours of work and minimum rations)' (Innes 1984:61).[133] This point has gone very largely unnoticed by scholars, for example by Wilson (1972) and Jeeves (1975, 1985). Levy more specifically notes that prior to securing adequate supplies of labour, other strategies for reducing the costs of production were implemented, apart from reducing wages:

> …curbing the cost and quantity of food[134] and making the working day underground and over ground of uniform length on all mines (Levy 1982:82).

[132] Levy (1982) devotes a brief chapter to each of the Chamber's institutional measures in this regard, ones that turned out to be highly successful, when for the first time there was an over-supply of labour. The working time arrangements had held and food costs had, like wages were depressed, and were kept consistently low. In 1956 food costs were 14d per head per shift (Walker &Weinbren1961:262). I can testify, but regrettably not produce as evidence the nutrition cost sheet loaned to a fellow researcher that in 1999, the evening meal cost 19 cents. I did, however, partake in a similar gruel some evenings while housed in the migrant workers' single sex compounds which workers widely avoided, preferring to cook illegally in their rooms. COMRO research on nutrition was fairly extensive, with Wyndham (1965) citing reports produced by the Applied Physiology Laboratory (APL) and a body referred to as the APSC, with titles such as 'Research into the relationship between feeding and work output' (APSC 1/60); 'Report of progress on the introduction of "On Demand" feeding in mine compounds' (Aug 1961-Feb 1962 APL 43/61); 'Study of mine workers' attitude to feeding practices in the compounds of the gold mining industry' (CSIR, NIPR June 1962) and 'Report of surveys of direct measurement of food issued to unprivileged labourers at 5 mines at the request of mine managements' (APL 15/63).

[133] This standardisation of industrial time was a particularly early development. Twenty years earlier on some English collieries, 'Pay Monday' was recognised by employers as an informal day off, as the industrial work week had not yet been stabilised and only 'dead work', i.e. maintenance and repairs, was going on. In 1874 this 'settled habit and custom' (of Monday off) was still the case in the steel-mills (Thompson 1967:74). This was the day for personal business, a matter to resurface over a century later and become a bone of contention (see Chapters eight and nine below).

[134] The quantity and quality of food, it has been argued, was a contributory issue to the 1946 mine workers strike (see James 1987). It remains a huge issue for miners up to this day, as it was in 1999 when I ate in the compounds, and was again in 2007 when my colleague Sizwe Phakathi was

In addition, whatever the number of hours worked had previously been, these very early regulations of working time resulted in a:

> …minimum of nine hours of actual labour per day (i.e. 'at the face') for underground African labourers and ten hours per day for the man on the surface (Levy 1982:82-5).

It should immediately be noted that working for nine hours at the face, even under the best of conditions in the 21st century, represents a longer working day overall, as hoisting, travelling and waiting underground need to be accounted for, let alone time to get to and back from work, but which would have been relatively brief for the compounded labour force. At an absolute minimum this is a 10 hour day. In retrospect, the predictable initial response of workers to the twin measures of a 20% wage reduction and the 'new minimum' hours, especially those of Basotho origin, was to desert (Kimble 1999:48). Under more adverse economic conditions at home the following year, desertion was reported to be 'a relatively small exodus' (Kimble 1999:49).

Given hoisting, travelling time and waiting underground and on surface - as noted in the previous chapter on industrial time - this would have, framed by and located within the duration of the labour contract, almost certainly made a very long working day, potentially stretching to what must surely be its absolute maximum physiological length[135]of 70 hours a week, given that men were, at this point in time prior to 1911, working seven days a week.

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back in the compounds, reporting worker dissatisfaction.

[135] Even conservatively, in modern times living in the hostel compound it would take, at the barest minimum, at least an hour, to get to work. On virtually any vertical mine, time is consumed from waking up to organising kit, washing and eating, walking or taking a bus to the shaft, time spent in the lamp-room, waiting at the crush, clocking through, walking to the cage, waiting to be hoisted down, hoisting, getting out of the cage at the shaft station, walking to the waiting place, waiting for the miner or team leader and receiving instructions and to get to the stope to begin actual preparations for the job for the day - and then only finally to start working.

After the shift a worker needs to get back to the waiting place to clean up and change, then travel by foot or wait for the tram (again for up to an hour in deep level mines), wait again for the hoist

Bolstering the tradition in the literature of understanding desertion as a reflection of worker consciousness (van Onselen1976), the length of the working day as one of the critical indicators of working conditions must clearly have contributed to the significant rates of desertion. More prosaically, desertion may have simply been a matter of immediate physical survival.[136]In an overt expression of worker consciousness, there was a two day strike on one mine as a result of the 1896 measures (Levy 1982:95). Whatever the case, the longer men stayed, the more they became acquainted and acculturated into the vicissitudes of a proletarian life spent in the compounds and working on the mines.

5.3.4 Labour contract length and proletarianisation: 1904 - circa1920

The complexity the process of proletarianisation entails cannot be fully entertained here. The intention is merely to present some evidence from the secondary literature as to the relation between the length of the labour contract and proletarianisation.

Regarding the gold mines, at least two commentators point in the direction of production when analysing proletarianisation. William Beinart (1980:101) argues that the changing patterns of proletarianisation need to be sought, and much work has followed from this position. The index of such patterns is not merely the quantity of labour, which has assumed the focus in the literature, but its stability and length of contract. Those workers who had settled in urban areas had done so by virtue of 'having

for perhaps half an hour or, for Moodie's informants (1976:47), for as long as one and a half to two hours, get through the shift controls, hoist up to surface, with 40 men per level on three levels at a time. With over 4 000 miners on a staggered shift schedule, after hoisting and getting back to surface, workers clock through the crush, walk or catch a bus again (another queue) before eating (yet another queue) washing and scrubbing kit (often another queue), all in an hour and a half at the very best.

[136] Given my own experience of living in the compounds a century later, my own vote is for the survival argument, the underground environment being especially intolerable when you are sick. That a mine manager was able to issue 300 fines over two years for sleeping on the job suggests both exhaustion and the regularity of exhaustion (van Onselen 1980:144).

worked for years on the mines' and having 'become skilled labourers' (Moroney 1982:261).

Spiegel argues that rural differentiation depends on wage earnings - directly related to the labour contract and its length - and must be seen at the macro level of class formation (Spiegel 1980:111-112). The relation between the length of the labour contract and proletarianisation suggests this may provide the perspective on class formation Spiegel seeks when viewed from the point of view of earnings achieved over time. For Spiegel, wage-earnings are the independent variable. Workers who spend longer at the mines would both earn more and tend to manifest classic characteristics of a proletariat. That contracts systematically lengthen, as will be shown, contributes to proletarianisation both quantitatively (increased earnings) and qualitatively (gaining industrial experience and skill and social status over time).

During this period, though, the Transvaal Chamber of Mines 1904 Annual Report explicitly establishes not just the link, but in addition, the fact that long labour contracts and proletarianisation - however 'incomplete' due its migratory nature - had already been secured. Levy (1982:145) suggests the Chamber's post-war analysis was that the previous 12 years had resulted in a 'standing army' of men [who] remained at work 'continuously for *very* long periods, forming a sort of stock-in-hand:' this 'army' consisted of 'men who regularly renewed their contracts, accepted an urban life-style and only occasionally returned to the rural regions (Levy 1982:145) (my emphasis).

Significantly, as Levy goes on to note, this workforce was, as a result of its continuity and accumulated training, the most skilled section of the African workforce, on which the industry depended. Eighty-five percent of mine labour was drawn from beyond South Africa's borders at this point (First 1983). Wilson's figures come out at 94% (Wilson 1972:70).

Nearly two decades later, however, the relation between contract length and proletarianisation is again shown. In the run-up to the 1920 black mineworkers' strike,

amid growing worker militancy fuelled by rapid inflation, the Chamber of Mines announced a bonus of five shillings a month for all underground workers who had completed 180 shifts (Bonner 1979b:278; Allen 1991:235). The tactic could be seen, it has been argued, as potentially having two benefits, to stem the rising tide of militancy as well as contribute to stabilising the African labour complement by way of encouraging the institutionalisation of the six month contract among non-Mozambican mineworkers.

Amid a range of factors affecting workers leading up to the strike, it was those workers who had been on the Rand the longest, by virtue of working longer contracts, who were the most seriously affected (Bonner 1979b:280). Further, the leading echelon of workers at the forefront of the strike were those who tended to work longer contracts and those who had been fully proletarianised, for 'the miner would often marry and raise a family and move out of the compound into the neighbouring town' (Bonner 1979b:284). This observation has considerable implications for a more complete understanding of the role of labour time in the development of industrial discipline and the 'making' of a proletarian working class and industrial militancy that almost inevitably follows in its wake. One example of such militancy occurs in the context of what Phillip Bonner describes as a period of 'the more permanent displacement of labour into the capitalist sector' and African workers' 'desire for upward mobility in the mines, and a corresponding resentment against the job colour bar' (Bonner 1979b:282). Reporting evidence to the Low Grades Mines Commission in 1919, Bonner cites the manager of Village Deep as saying: 'Boys [African mineworkers] who have been with the machine men for a long period and whose work they know well will not do their work' (Bonner 1979b:282). It was these men who were part of a 'distinct movement among the natives to curtail their [work] effort' (Bonner 1979b:282).

In identifying patterns of participation and repression in this period across Southern Africa, the twin processes of urbanisation and proletarianisation are clearly linked to the time men spent servicing increasingly regular and longer work contracts (Bonner 1979b:282-286). For the mining industry in the first decades of the 20th century, in the

employment of non-South African labour, both ‘tropical’ or ‘foreign’, particularly from Mozambique, ‘an important economic advantage was the longer minimum period of their labour contracts’ (Johnstone1976:33).

In discussing the militancy of the National Union of Mineworkers in relation to migrancy over 60 years later, the same point is made: Mozambican (and Malawian) miners were valued due to their ‘greater regularity and commitment to mine employment,’ mineworkers often returning to the same mine, gang and job (James 1987:19). Extended periods of labour time clearly consolidates occupational stability and enhances the unique experiential skill mining requires. In the year 2000, I recall a mid-level manager expressing surprise that a worker had been identified as having returned to the same level underground in a mine for over 20 years.

This stability of time and attachment to an individual mine and individual work-place continues to go to the heart of productive efficiency, as it did when it was argued a generation ago that ‘the longer contract stabilised the African labour supply and raised the average level of competence of the African labour force’ (Johnstone 1976:33). It was also this particular group of men, the Mozambican cohort, who began to constitute a social force that was to challenge the hegemonic status the industry enjoyed.

5.3.5 Lengthening the labour contract: 1890s - mid 1970s

On the gold mines, labour contracts appear to have initially been for a period of three months, at some point extended to six months. Allen suggests that from 1895, the Transvaal government more widely limited the contract to 330 shifts: this almost certainly only applying to Mozambican contract labour (Allen 1991:198). Around the turn of the century, a six month contract at Pilgrims Rest, judging by other districts where this certainly appears to have been the case, would probably take seven and a half to eight months to complete (Bonner and Shapiro 1993:181).

In 1906, Allen, citing van der Horst (1942:102), shows the Chamber paying large labour contractors’ fees in accordance with contracts of three, six and 12 months’ duration. The

difficulties of obtaining labour and conflicts between the Chamber and the State, arising from competition over the labour supply regarding agriculture particularly cannot detain us here. Rather, it was the Portuguese authorities who ensured 'the industry's success in securing labour for longer contractual periods at differential rates from the remainder of the labour force' (Levy 1982:63). Importantly, these longer contracts could be negotiated *en masse* at the political level in society across Southern Africa (Levy 1982:64,73). This was, however, not enough to satisfy the industry's requirements for labour. More was required, and it is no accident that around this time there is a progressive lengthening of the British South African labour contract.

Breaching this labour contract, a key component of what Johnstone describes as 'an integrated system of extra-economic compulsion, constituting the contract system, the pass system and the compound system', was a criminal offence (1976:35). This does not suggest that all mineworkers were universally trapped within this system. Jeeves suggests mineworkers would become 'voluntaries' after the expiry of their first contract, leave the compound and seek work elsewhere (1985:171). Jeeves further remarks that as 'mineworkers gained in experience and sophistication through repeated trips to the mines, many more of them became voluntary labourers' (1985:162). Under conditions of labour shortages around 1912 - when contracts 'ranged from 2 to 8 months in a competitive recruiting environment' (Crush 1992b:53) - and before the labour recruitment system had more fully established itself around seven years later, the voluntary labourer was apparently much prized 'because of his motivation (he has after all chosen to come), his experience, and his efficiency' (Jeeves 1985:169). An attempt in this year to provide incentives for African workers to extend the standard contract failed to achieve its objectives 'to minimise the time spent between mine contracts, to encourage more frequent and regular return to the mines, and to discourage movement from one mine to another' (Crush 1992b:56). At the time there were three kinds of voluntary contracts in force: 'local' men moving from non-mining employment to a mine, 'transfers' from one mine to another after expiry of a contract, and 'new' volunteers arriving independently, 70% falling into this last category (Jeeves 1985:154).

After 1916, when there were less inexperienced men on the mines, shorter contracts and preferred work were 'routinely' available for these men, especially if experienced, even extending to week-to-week contracts (Jeeves 1985:154). This relative autonomy workers enjoyed in the labour market, due to war-time labour shortages, was as unusual as it was short-lived, the labour contract only ever briefly reducing in length in the context of exceptionally dire labour shortages. It was not only working experience, born out of time spent on the mines, which was highly valued. Labour time itself, by way of a short contract, was used as an incentive to recruit mineworkers under conditions of short supply. These men had attained a degree of independence. Phillip Bonner records the mine manager of Village Deep saying in 1919 'that a large proportion of East Coast miners come as voluntary boys who can choose which mine to go to' (1979b:296).

Of these 'East Coast' men Levy quotes Perry the Chairman of WNLA, saying:

> It is not too much to say that in efficiency they represented four-fifths of the whole native labour on the mines before the war. They were the backbone of the industry. *The cost of the labour force was unimportant by comparison* (1982:159) (my emphasis).

On this evidence, the costs of different echelons of labour are subordinate to the overall labour time a man had put in, which defined him in the eyes of this key representative of the gold mining industry. At a point in 1905, when there was for the first time an ample supply of labour and the industry was in a position to choose whom it employed (Levy 1982:239) the Board of Management of WNLA:

> …now ceased to refer to recruits as an undifferentiated quantity of muscle-power. They became instead 'labourers of differing degrees' (Levy 1982:243).

Again, this view of a key institutional role-player suggests that differentiations in the previously homogenous mass of unskilled African labour turned around the quantity of labour time expended within the mining production process. Even more broadly, at the

political level emerging from this point onwards, the time African workers spent at work on the mines was of sufficient importance to be used in an argument for racial equality in evidence to the 1903 Transvaal Labour Commission:

> …as a muscular machine, the best developed native (when he had remained long enough at the mines to be thoroughly trained) is the equal of the white man (Levy 1982:180).

In the year of the Rand rebellion in 1922, efforts to recruit workers from British South Africa were stepped up, and two years later the minimum period of a labour contract of six months was raised to nine months (Kimble 1999:185,198). At this point South African workers served working contracts of six months while, to reiterate, Mozambican workers served from 12 up to 18 months. Five years later, in 1927, protests were directed at this expansion of the contracted labour time by Mpondo workers from the Transkei when the six month contract was extended to nine months (see James 1998:102). These men interestingly demanded payment for their rail transport costs or release from their nine month contract. There was a proviso in the miners' demands. They should only be released after they had paid off their debts accumulated on leaving for the mines, suggesting workers were striving to ensure they left work on an even financial keel and were not immediately forced back into wage labour to spend more time on the mines serving yet another arduous labour contract.

By 1943 the AMWU, in their submission to the Lansdowne Commission, indicated that '…theoretically there are several types of contract open to the recruit, namely A.V.S.[137] and N.R.C. contracts of 180, 270 and 360 shifts' (Allen 1991:430; Moroney 1978:46). Agreements as to how long a contract was were not always clearly defined (Warwick 1978:27). In pointing out that the contract was not freely signed, the AMWU found it noteworthy that:

[137] The 'voluntary contract' of the Assisted Voluntary Scheme (AVS) was described in official reports as 'indentured' - a worker being 'contracted, attested and traceable on desertion' (Kimble 1999:183). It appears this contract was measured in terms of calendar months and not the number of shifts worked.

> … longer contracts, which involve 9 months or a year continuous hard work, under which many men desert, are signed mainly by the raw kraal natives, who do not realise the implications of the contract into which they are entering. Usually they signed in batches (Allen 1991:431).

Trader recruiters, the same document reported, generally appear to have imposed the roughly nine-month, 270-shift contract on recruits, as it was reported that they 'will not allow the men to sign short-term contracts' (Allen 1991:430). All manner of dissatisfactions regarding the contract itself were noted, the problem of receiving wages only at the end of a contract being but one (Kimble 1999:92). This deprived mineworkers even of a measure of financial independence within the time spent in the labour contract, over and above the complete set of controls the contract represented, as Crush was noted to have enumerated above. Managerial strategies to lengthen the contract were often illegal and used force, as van Onselen first showed in the case of the Rhodesian mines (1980:98-9).

Where force and duplicity failed, there was but one other option: a human relations approach. Yet it is only in the late 1940s, significantly around the time of the 1946 mine workers' strike, that the idea of more humane ways of dealing with African labour is first mooted (see James 1987). In 1954 COMRO conducted research on the attitudes and opinions of African workers to mining, and concluded that 'human relations are of prime importance on their influence on a mine's image and on the satisfaction of its workers' (Hudson 1954, cited in Jensen 1969:55-6).

The Assisted Voluntary Scheme (AVS), whereby workers from South Africa and the British territories were permitted to work four-month contracts, was significant only until shortly after the Second World War. From 1948 to 1975, of increasing numbers of workers employed on the mines over these years, those who worked contracts rose from 57 to 96%, and it has been suggested we can 'safely assume' the length of time spent on the mines by the average worker increased (Wilson 1976:11).

There is at least one snapshot of how many shifts were worked in 1960, where, in one mining group, the average number of shifts comprising a labour contract were as follows: South Africa 245; Botswana, Lesotho and Swaziland 248; Mozambique 413 and north of latitude 22degrees South 383.

That the length of the contract continued to be of critical importance to the industry is indicated by the argument the Chamber made before the Lansdowne Commission. The argument ran against the necessity of higher wages for black workers. The Chamber argued that:

> …if men were paid more they would simply work for shorter periods for workers to 'earn what they need before returning home' (Wilson 1972:75).

The Chamber's view came to change, however, on the basis of its own research. A 1964 COMRO study:

> … confirmed previous findings that voluntary extension of service was clearly associated with level of earnings: the high earning occupations within the industry retain men for longer periods of time. This is contrary to the general belief that higher wages reduce service periods on the mines (Cited in Jensen 1969:67).

Despite this study, the official and centralised mouthpiece of the industry suggested that workers remained wedded to a pre-industrial sense of time, *a la* EP Thompson (1967), and were not amenable to rational imperatives of greater financial incentives on the basis of more time spent at work. The tradition of 'target work' on the mines nevertheless remained embedded in mine workers' life strategies, 90% of workers having failed to 'reach the earnings target they had set for themselves', resulting in two thirds of a sample group of contract shovellers indicating they would extend their contract as a result (Jensen 1969:68).

The evidence for the importance for the mining industry of the already long and often extended labour contract is not in doubt. The problem for the industry has been seen to remain through to the late 1960's, it only having ever been but briefly resolved decades

before when a very specific group of workers, for a brief few years, worked much longer contracts.

5.3.6 Indentured Chinese labour: 1903-1907

The indenturing of Chinese workers, who were subject to even greater confinement in hostel compounds than were African workers and were unable to work elsewhere or abandon their contracts (Kynoch 2005:541), was the gold mining industry's answer to the problem of a stable labour supply. A labour shortage may have been engineered to facilitate this exercise.[138] While a few mines used Chinese labour exclusively, most of these workers worked underground while African workers were hired 'for the more poorly paid surface positions'(Kynoch 2005:533).

Taking the 12 month Mozambican African labour contract as the norm, Chinese labourers 'were contractable for more than three times the average period of African labour, although they would not necessarily be cheaper' (Levy 1982:199). In 1905, the cost to the industry for food for Chinese workers, for instance, 11d per day, was higher than that for black workers at 5d per day. Acquiring a Chinese worker cost the industry 14 pounds sterling and 10 shillings and their accommodation was also better. The cost of housing and feeding an African worker was 10 pounds and 15 shillings (Bozzoli 1981:309). It is notable that, again, costs, even in the notoriously cost-sensitive gold mining industry, played second fiddle to labour time by way of a longer labour contract.

Taking the six month South African labour contract as the norm, the Chinese labour contract was six times longer than the average labour contract (Marks and Trapido 1981:70). Despite the length of this contract, the end of the contract was prone to manipulation by management who, 'in sullen resentment at the prospect of losing a skilled labour force', would 'grind out the last ounce of them before they leave' (Kynoch 2003:12). This three year contract was, in addition, renewable for a further

[138] See Kimble (1999:56) referring to the minority report of the 1903 Transvaal Labour Commission and Levy's full discussion (1982).

three years, although doubling the length of the three year contract was withdrawn shortly before the entire exercise came to an end.

Regarding the Chinese labour contract '… it was necessary not only that the labour was cheap and voluntary, but that it exhibited a degree of consistency' (Richardson 1976b:2), a point taken up more generally in this thesis. That Chinese labour was only considered fully productive after a period of three to six months and that the combined costs of procurement and fatality rates made indentured labour more costly than African labour (Richardson 1976b:5), speaks to the importance of longer contracts generally. Suffice it to say, Richardson shows how the advantages of the three year contract were exploited to the full, and that between 65 and 70% of these labourers were employed in the strategically most important jobs, namely hand-drilling in the stopes (1982:171ff). These men proved to be physically strong and disciplined and sustained high levels of productivity a year after their arrival (Richardson 1976a:156).

It is, however, only partly on the basis of contract length that Richardson can argue that the impact of Chinese labour on the fortunes of the mining industry at a time of a severe crisis of accumulation was 'dramatic, rapid and successful' (1982:178). Contract length alone does not explain the productivity of this labour, which was 'the most efficient that has ever been known on these fields' according to an official contemporary account (Quoted in Richardson 1982:180).

A key reason for the productive efficiency, over and above the increased area of stoping the utilisation of Chinese labour permitted, was that:

> This increasingly competent and sizable labour force, taken in conjunction with the increasing numbers of their African counterparts, enabled the companies to work more stopes in a cleaner manner and increased the possibilities of surface sorting. This process had a double impact. By extending the stoping area, *whilst narrowing the size of the individual stopes*, it increased the output of cleaner ore, and controlled the further lowering of the grade (Richardson 1982:180) (my emphasis).

That Chinese miners enabled narrower stope widths is significant. You must be in a contemporary modern back-fill stope with a width (height actually) of 800mm (spatial dimensions 800mm x 1 400mm x 40m in a backfill stope up to 3km underground) and operate a hand-held percussive rock drill, to appreciate the point. What stope widths were in the early 1900s has not been established. In the 1930s they were certainly narrower than in Australia and the USA (Perrings 1977:131). The important point is that Chinese indentured labour permitted the control of the stope-width, a critical major contemporary measure of efficiency.

Chinese labourers worked underground for 10 hours a day, six days a week, on both day and night shift. Curiously, in terms of their contract, Chinese workers, as previously noted, were in a unique position: they did not work on Sundays and certain specified holidays (Richardson 1976b:158). When forced to do so, they protested, with police fire killing a Chinese worker and wounding 20 others on one occasion (Kynoch 2003:12). On another occasion police were called in to put down a protest by Chinese workers at the Cason Mine when they were forced to work beyond their three year contract. The attorney general at the time found it necessary to order management to observe their original contract, and noted that the Chinese workers 'resented and I think they resented with reason the violation of their contracts of service'(cited in Kynoch 2003:12)

It is not clear to what extent the labour contract was adhered to more generally as a contemporary report, penned by a 'prominent leader of the industry', a certain Major Collins, suggested that, 'if properly handled, the Chinaman is as docile as a child, and what is more you can get him to work sixteen hours a day for seven days a week' (Bozzoli 1981:95,309). This is definitely not possible or sustainable, being 5376 hours a year, even assuming a break of four weeks. Such hours are considerably higher than the longest hours ever recorded, that being the high point of long working hours in England in 1830, estimated to be between 3 232 and 3 439 hours a year (Voth 2000:249). The evidence of Major Collins is further to be treated with caution as the Chinese were by no means universally 'docile': 'they struck, sabotaged, rioted and, above all, deserted' (Bozzoli 1981:95). The bloodiest confrontation, in which seven workers were killed and

10 were injured, occurred between Thursday 21st and Saturday 30th January 1909, when management of the Village Deep Mine 'urged' them to work over the Chinese New Year to which their contract legally entitled them (Kynoch 2003:12).

Despite its economic success in partly resolving the crisis of accumulation from the turn of the century to 1907, the indentured Chinese labour experiment was abandoned for political reasons (Richardson 1982:166). Mozambican workers would take the place of the Chinese miners, and would work under the narrower stopes and on longer contracts than any other African labour. As Richardson indicates:

> …the mines were able to make their successful adaptation back to African labour… In this situation they concentrated on securing a great increase in the numbers of Africans recruited in Portuguese East Africa by WNLA … The twelve month contract, the general willingness to operate underground, *the frequency with which these contracts were renewed* … made these men the most suitable to replace time-expired Chinese miners… By March 1908 it was operating with such success that sufficient Portuguese Africans were coming forward to replace six-month contract African workers … (Richardson 1982:186) (my emphasis).

As the Chinese left, Kimble argues, so the mines, in addition, 'increased the extraction of surplus value from the African workforce' by promoting and extending piece-work (Kimble 1999:57). For as Katz has argued, the experience of the industry with Chinese labour 'paved the way for the mineowners to use new methods of organising African labour' (1976:109). The workers replacing the indentured Chinese labourers were to constitute the backbone of the industry for the next 70 years.

5.3.7 The Mozambican 12 month contract: 1909 - mid 1970s

The 1909 arrangement with the Portuguese Authorities was modified in 1914. Limiting the *extension* of the 12 month contract to six months seems to have cemented matters in terms of the length of the labour contract. For this is this arrangement reported, over six decades later, by Ruth First in her thorough social scientific study of the export of labour from Mozambique, including a dedicated focus on the length of the contract of

Mozambican mineworkers. This arrangement consolidated the significant proportions of Mozambican miners on the South African gold mines until the mid-1970s ushered in a radically changed scenario.

In the first two decades of the 20th century when desertion continued to be rife, Jeeves suggests 'few of the experienced Mozambican workers tried to flee the Rand' (1985:167). By 1914 desertion from Mozambique was negligible, WNLA recording 100 deserters out of a workforce of 68 000 men (Jeeves 1985:167). Moodie, striking a different chord, suggests that, due to the length of the stay on the mines, it was 'not surprising' it was the Mozambican workers who led the boycotts of the concession stores on the mines in 1918 (1997:12). Industrial discipline had been achieved: men had come to work on long, often repeated contracts and this had certain implications. With reference to this decade, longer and more regular contracts were shown to lead to general competence and occupational seniority with regard to 'Shangaan'[139] boss boys (Bonner 1979b:285). It was from the occupational ranks of these men that leadership was provided in the 1920 strike, Allen avers (1991:343-4). The drillers were also well-paid jobs and those who dominated this occupation were also the so-called 'Shangaan' Mozambicans. Mineworkers from no other geographical region would constitute as large a proportion of black labour employed by the mines than those from Mozambique from 1869-1969 (Wilson 1972:70). Quoting Ruth First's study (1977) and Crush *et al* (1991), Judith Head nudges this date on to 1971 (1995:129).

It was these Mozambican men who were specifically to arouse anxiety among both the Chamber and the governing authorities as to their political behaviour in the compounds. Allen notes these men:

> … were the longest serving of all mineworkers. They were the nearest the mining industry got to career mineworkers. Through their relatively long

[139] Guy and Thabane caution against the 'dismissive ethnic stereotyping' of terms such as 'Shangaan', 'Xhosas' and 'Mpondos' employed by one of their informants; yet this usage mirrors conventional use of such appellations on the mines (1988:266).

> contracts they had acquired skills and occupied most black positions of authority (Allen 1991:343).

The concern around political activity in the mid-1930s was sufficiently serious, Allen argues, for the Portuguese and South African authorities to 'adopt measures in order to prevent any activity of a communistic character among Mozambican natives while at work in the Union' (cited in Allen 1991:344). What these 'measures' were has not been established. What is significant is that these political concerns at the level of the State related to the group of workers serving the longest contracts.

In 1939 the Chamber's Gold Producers' Committee declined a request by the Acting Director of Native Labour in the Department of Native Affairs in Johannesburg for the Chamber to recognise a mineworkers' union. The Department had submitted a set of model rules for the purpose. The Chamber was 'strongly averse to any steps that would encourage the growth of the trade union movement amongst Native mine workers' (cited in Allen 1991:345). In view of concerns about 'activity of a communistic character', it seems reasonable to infer the Chamber may have had their reliable 'East Coast' Mozambican workers in mind.

The importance of the longer contract is signalled in the same year with the Chamber, for the first time, paying transport costs (and food) of all men coming to work for 270 contracts or more (Wilson 1972:72). By this time, O'Meara argues, the process of proletarianisation, at least in the Transkei and Ciskei, was 'most advanced' (1979:207).

In an attempt to explain the origins of working class values and networks at the level of individual agency, McNamara in the 1970s notes that 'Working values and friendships are developing mainly among individuals and groups who stay longer on the mine and who hold higher paid jobs'(1980:333). Conversely, the rate of turnover of individual migrant workers influenced both the development and cohesion of social networks. Given the tenor of my argument, it is unsurprising that 'the group of workers who express most clearly the common values of all mine workers in particular social

situations are the Mozambicans' (McNamara 1980:334). Based on analysis via participant observation in hostel compounds, McNamara confirms the figures of 12 to 18 months for Mozambican workers and significantly shorter periods for South African workers 'whose stays rarely exceed eight months' (McNamara 1980:316).

To jump for a moment to the South African collieries, Peter Alexander shows that where local labour worked shorter contracts, the Portuguese (Mozambican) longer 'twelve month' contract applied (Alexander 2001a:4). The longer contracts worked by this group of men clearly powerfully contributed to the making of a mining proletariat. This perspective may provide the missing piece of the explanation Alexander seeks in attempting to explain the militancy and leading role of the Mozambican colliers and their propensity for strike action in the decades between 1925 and 1950 (see Alexander 2002).

The presentation of this evidence is not to be understood as advancing a mono-causal argument for proletarianisation in terms of labour time expenditure. Regarding the 1946 mineworkers' strike, and referring to a particularly impoverished period in the Ciskei and Transkei, O'Meara shows that those at the forefront of this strike were those '... from areas where rural impoverishment was most acute, where the process of proletarianisation was most advanced…' (O'Meara 1979:207).

Currently, on platinum mines, white supervisors underground decry the absence of the efficient and competent older Transkeian 'soldiers of the mine'. These men stand in visually stunning contrast to the very much younger novices employed as a result of Royalty agreements between local communities and the platinum mines - requiring the mines to utilise local labour from the villages in the vicinity of the mines - and who have been found to be not physically up to the task.[140] Many of these retrenched gold

[140] A research colleague was aghast at the comparative youth (her own age - late teens to very early twenties) of the local men employed. At least in one instance, mine management instituted physical tests of strength, as local labour was unable, it transpired, to lift and manipulate underground support struts, the elongates or 'madodo props' as they are known in the industry. Of these young men, virtually all matriculants, a number were studying for their personnel diplomas

miners, older men, twice the age of the local novices, now work for contractors and live in tin huts in the open *veld*.[141] I have watched these men queue in pensive silence in erect military order, clad in immaculate, yet personalised mining uniform, each with a face of extraordinary character, as if etched out of stone. These men too - as we shall see - would have been hewn out of the twelve month labour contract.

5.3.8 Lengthening the Lesotho labour contract: 1919 - late1980s

Referring to the importance of gold mining in South Africa and the role of low-paid African labour from beyond South Africa's borders, and those from the British colony of 'Basutoland' in particular, Jeff Guy and Motlatsi Thabane suggest these workers have given a 'good proportion of their working lives and physical strength' to this endeavour (Guy & Thabane 1988:257). The contribution of these workers to the development of modern South Africa, they argue, was 'considerable' and historically, inadequately recognised (Guy & Thabane 1988:258).

The Lesotho contract was shorter than the Mozambican contract (Wilson1976:10) and the former have shorter working lives on the mines than the latter (de Vletter *et al* 1981:89). Very broadly speaking, as Chinese workers had replaced Mozambican workers only to be replaced by them again, so, decades later, Basotho labour replaced the Mozambican contract workers. The circumstances in which this occurred were that 'longer-term recruits, contracted for a minimum of 9 months, were replacing the Portuguese 'backbone', while the shorter-term, so-called voluntary labour met the more fluctuating requirements' (Kimble 1999:183-4).

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and arguably might be the most highly educated underground workers on the African continent. Their brand of militancy cannot be told here. Suffice it to say they knew their mining regulations better than the white shift overseers of the old guard, who had not generally matriculated 20 years before when they were novices underground under very different conditions.

[141] The grassy or scrubby African landscape.

As in the case of each labour-supplying country[142], there is a specific history and there are inter-related connections to be made before any full account can be constructed. In any such future account, the 'trend towards longer contracts' must surely feature prominently (Kimble 1999:195). In the case of Lesotho, Judith Kimble, unusually for the secondary record, consistently has absolute surplus value extraction as an underlying explanatory theme running through her evidence: capital lowered wages and lengthened the 'hard contract', articulated in the State's concern at key points to tighten administrative procedures to control desertion and enforce the labour contract (Kimble 1999). Kimble intimates how sensitive the management of the length of the contract proved to be for the gold mining industry. The 'enforced extension of the minimum contract reduced the numbers coming forward' (Kimble 1999:183). Clearly, a sensitive treatment of contract length was required for using this key mechanism for supplying and retaining labour in order to prevent it having an effect opposite to that which was intended. Labour time and wages and the *acquisition* of migrant mine labour clearly remain inextricably intertwined.

In the early years around the 1890s, workers from Lesotho tended to work contracts of between one and four months (Kimble 1999:249). After the South African War, employers of all stripes attempted to 'lower wages and lengthen contracts' (Kimble 1999:5), thereby simultaneously absorbing historically unavailable surplus labour, decreasing socially necessary labour time overall, and thereby decreasing the value of labour power. Regarding the period of labour shortages around the First World War, Kimble asserts that:

> True to the patterns it had developed twenty years earlier, the Chamber of Mines was now lengthening the minimum contract for British South African migrants. In 1919 this was raised from 3-4 months, or 90-120 shifts, to 6 months (180 shifts) and in 1924 it was raised again to 9 months (270 shifts) (1999:182).

[142] Christiansen and Kyd (1983), for instance, discuss aspects of the case of Malawian contract workers, as does Crush (1992(a)) regarding average contract lengths of workers from South Africa, Lesotho, Malawi, Mozambique and Angola from 1951 to 1960.

Kimble, consonant with the tradition and in the interests of providing a fine-grained account, notes it would take considerably longer than a lunar month, for instance, to complete 30 shifts.[143] These workers served the industry well by providing, in addition, 'voluntary labour' of varying lengths of contract, '… from one month… in a few mines to three, four and six months ... in others. The most common period is four months' (Kimble 1999:183). Meanwhile, the Native Recruiting Corporation explained: '…the recruited native who engages himself for nine months service on a specified mine is in many respects the more valuable employee' (cited in Kimble 1999:183). Kimble, quoting van der Horst (1971:212), cites figures where, of 67 mines in 1921, 80% were prepared to take on 'voluntary' workers for 90 shifts and half would employ a man for a month. By 1932, however, only four mines would employ a worker for a month, signalling that only under circumstances of extreme need were very short contracts allowed (Jeeves 1985:170).

It was, however, only towards the end of the 1920s that mineworkers from British Basutoland begin to work underground, traditionally dominated by Mozambican workers. A further division of labour within the African proletariat then occurs. Up until that point (in 1918 only 6,98% of WNLA recruits are from British Basutoland) these men are not yet fully integrated into underground work in gold mining and work short contracts. A contemporary voice, noting 'sick reporting' when weather is bad, 'quite good results' at work, 'occasional obstruction', 'passive resistance' and refusal to do 'overtime or to work on Sundays at the local rates', suggests a complex set of forms of individual resistance not readily interpreted on the basis of this set of brief quotes. From primary sources, Judith Kimble finds she can only draw tenuous conclusions as to patterns of labour migrancy for the 1920s (1999:205). A survey conducted in 1930 - which showed that over 50% of migrant workers worked longer than the standard nine month contract (which took 10 months to complete) at the time - identified a worker from Basutoland who had worked continuously for 17 years on two mines (Crush

[143] Charles van Onselen had, of course, made the point before (see 1980:98).

1992(a):54). By 1935, however, virtually 90%[144] of workers from Basutoland were underground, ending up dominating the difficult and highly specialised occupation of shaft sinking (Guy and Thabane 1988). As noted in the previous chapter, what distinguished this occupational group from all other mine workers was that these men worked continuous shifts and were excluded from the 'maximum average system' that regulated mine wages.

From 1935 through the next 20 years, four new gold fields were developed. These fields included the Free State gold fields, which accounted for 55,8% of the total gold output in 1958 (Innes 1984:161). The significance of these developments was the introduction of mechanisation and the consolidation of Anglo American as the largest mining house in the world. What is pertinent from my point of view and the conceptual linkage born of noting the practice of encouraging long contracts in the context of the lack of mechanisation in stoping and abiding forms of absolute surplus value extraction by way of long working hours, is the significance of the considerable advances made in mechanisation to overcome the perennial problem of labour shortages and the harsh geological conditions of the new Free State goldfields (Innes 1984:150). These fields led to the demand for more skilled labour as 'hand tools gave way to machinery, as small machines gave way to larger ones and as simple systems were replaced by more complex ones' (Innes 1984:151). To meet this demand, the length of the service of contracted workers was extended. At the time, the limited attempt to settle this more skilled labour permanently with their families on the new Free State gold fields failed in the face of both apartheid policies and the lack of corporate political will on the part of Anglo American (see Crush & James 1995).

The failure of the 'stabilisation' experiment has been well treated in the literature (Jeeves & Crush 1995). As a result of this failure, these scholars go on to show the increasing dominance of non-South African labour on the gold mines during the 1950s

[144] The precise figure cited by Kimble is 89,6% (1999:184, citing official government figures from 1935).

and 1960s. By the 1970s this dominance reached proportions of almost 80%, so-called 'foreign' workers rising above 90% on some mines (Jeeves and Crush 1995:11). These workers would have been predominantly from Mozambique and Malawi. This situation fluctuated in the mid-1970s, as workers particularly from South Africa, as well as from Lesotho, become proportionately more important.

The mean length of service on the gold mines of Basotho workers, during the years of unprecedented crisis between 1970 and 1976, varied, for instance, between '14,2 months in 1974 and 10,6 months in 1976' (de Vletter quoting van der Wiel 1977; Spiegel 1980:4). Yet the lengths of six contracts worked by a Basotho miner were considerably longer than these averages and stretched from 14 months to 26 months (Murray 1981:41). The significant change in the recruitment policy of the Chamber to 'stabilise' the labour force, it was argued, was to '…ensure that those recruited stay on the job for as long as possible up to the legal maximum of two years' and to encourage men 'with experience and previous training' to return after leave as soon as possible (Spiegel 1980:3). The circumstances around which this two year maximum contract length came into force, presumably for workers from Lesotho, is not clear.

This being at the time of the Franzsen Commission in 1978, forced into existence by the long struggle of organised white labour, African mine workers, for the first time, began to take advantage of weekends afforded by the eleven shift fortnight (ESF). This could not have occurred before and signals the first break in the labour contract, workers making use of it initially being called 'week-enders'[145] (Crush 1995). Jonathan Crush implies, without citing any evidence, that black workers' struggles 'forced' this issue. While the 1973 Durban strikes, the Carletonville strikes and the 1973 shooting of workers was fresh in memory, and as the Gold Team's report to Franzsen notes the 'advancing aspirations of black workers.' in the wake of Soweto 1976, all of which signal the rising power of the black proletariat, there is no other evidence in the

[145] Researchers Phakathi and Stewart ashamedly took most Saturdays off. Hence, while prepared to share workers' living and working conditions, they did not share in the temporal rigours of their full working week. This did not go without wry comment from some of the men.

secondary record that black workers directly influenced the implementation of the eleven shift fortnight (ESF) and the opportunity of labour contract workers to take weekends off. This said, further research is called for and if Crush is right, this would point to black mineworkers using their objective power in production to press for shorter hours in the context of the new political mood these events evinced in the early to mid 1970's.

In the meantime, the enhanced degree of control over labour and the need for proven, time-worn productive labour had been met through re-engagement certificates - guaranteeing a job at the same mine if they returned to sign up for a new contract. The labour contract was now employed as a mechanism of ensuring not only a labour supply, but of the *type and quality of labour* long desired by the industry: the worker with time-honoured experience and skill. Early Return Bonus certificates complemented the system and resulted in the lengthening of the time spent on the mine, with shorter periods between contracts.

After the hiatus of the early to mid-1970s, labour recruitment from Lesotho grew steadily. In 1976 only 6% of Lesotho mine workers were staying the maximum length of two years; this climbed to 19% in 1979, and for the first six months of the year Spiegel does his research, the figure had risen again to 22% (Spiegel 1980:4-5). No later figures or trends have been investigated past this date, except that already more than a decade ago the recruitment of novices from Lesotho had virtually ceased (Cobbe 1995:153), bringing to an end the anomalous 24 month contract reminiscent of the labour contract of the early years of Mozambican labour.

While the case of Mozambique is unique, up until independence in the mid-1970s, the case of Lesotho suggests that each of the labour-supplying neighbouring States will reveal its own particularities. The conclusion to be drawn from the secondary evidence is that, until the numbers of South African workers began to equal and surpass that of non-South African labour and the labour contract was stabilised around 12 months, the length of the contract extended until it aligned with the current industrial working time

arrangements as these arrangements emerged out of the struggle between mining capital and organised white labour.

Until this occurred, as the table below clearly shows, there is transition in the patterns of working time, with the brief shortening of contracts occurring in the unique context of the mid-1970s. Contract lengths are reduced in the context of the most serious labour shortage the mines had ever experienced, precisely in order to ensure the availability of labour.

Country of origin	*1973*	*1977*	*1979*
South Africa	10,2	7,0	12,5
Botswana, Lesotho and Swaziland	12,6	12,0	15,6
Malawi	19,3	-	13,0
Mozambique	16,0	13,6	18,0

de Vletter (1981:154)

Hence, not only are long working hours crucial in retaining mining labour, but labour time measured in terms of the length of the labour contract, as noted above, played a central role at critical points in *acquiring* it in the first place.

5.3.9 The Chamber's 'privileged life' argument: 1943

The reliance of the South African mining industry on low-waged migrant labour is well documented (Bonner 2004). To take a historical step backwards, what is of particular significance regarding labour time as measured by contract length is the manner in which the Chamber argued in defence of the migrant labour system. Migrant labour was defended in terms of the length of the working life of the African mine worker, as in repeated statements by W Genmill, the General Manager for the Tropical Areas of WNLA, who represented the Chamber. Genmill was at pains to show that the average mineworker only worked on the mines for contracts of 14 months, and in total for 12 years between the ages of 18 and 40, at which time he 'retires' - this, by international standards, being 'an enviable position' (Allen 1991:367). Genmill lamented that:

> It would be monstrous to discard such a desirable set of conditions by detribalising these people and converting them into a discontented black proletariat in the towns (Cited in Allen 1991:367).

The assumption was that the reserves were economically viable entities, adequately able to support their populations or, at the very least, able to supplement the mineworkers' wage. This was given as a reason for denying cost of living allowances, annual leave and sick benefits (Allen 1991:369). That mine workers' working lives, constituted by seeing through a series of labour contracts, was relatively brief, is challenged by evidence from the secondary record. As we have seen, they both took longer to complete (van Onselen 1980), the 'long service Africans' stayed for years on end (Katz 1999) and as we will see below, the time between contracts for some workers shortened (Manona 1980), mineworkers served more contracts than previously thought (Beinart 1980) and contracts certainly lengthened from the 1980's onwards (Crush *et al* 1991). There is, however, as yet no study on the careers of mineworkers accurately specifying just how long workers spent on the mines during a working life to settle this question definitively.

5.3.10 The average length of the Mozambican labour contract: mid-1970s

It is the study directed by Ruth First in the late 1970s that provides more accurate figures on contract lengths for Mozambican mineworkers, tightening up Wilson's (1976:10) otherwise accurate estimate of between 12 and 16 months. Ruth First's research was drawn from over 700 in-depth interviews with Mozambican miners and cross-checked by the employment of two methodologies (see First 1977:57-70). Since the 1909 agreement and certainly still in 1964, as First notes, the contract length agreement with Mozambique was 12 months with an extension of six months.

With the contract length of old conventions still in place, First and her colleagues '…tried to determine more precisely the average length of the contract of the Mozambican miner' (First 1977:60-2). They found the average length of contract for the period 1969-1976 to be between 15 and 16 months. The average contract period was

15,7 months in 1969 and 16,3 months in 1972, dropping to 13 months in 1976 immediately after independence. In 1977, contract length, by regional difference in Mozambique, ranged between a mean average of 16,5 and 15,1 months[150] (First 1983:72). Between contracts, the average length of time miners stayed at home was seven months. It is worth quoting Ruth First in full regarding the advantages accruing to the industry as a result of this arrangement:

> The advantages of this situation for the South African mining industry are clear; (a) the more the overhead cost of recruitment and transporting the miner as a percentage of total labour cost drops, the longer the contract period at the mines. (b) Long contract periods and high frequency of the individual miner's contract reduce training costs and guarantee a stable workforce and high level of productivity (1983:72).

It is no accident that both of the advantages noted by First relate directly to the measure of labour time - the length of the migrant labour contract. By way of comparison regarding contract length, First's study notes that after Mozambican miners, those from Malawi served the second longest contracts. By way of contrast, workers from Swaziland - not considered generally to be 'career miners' of the status of Mozambican and Basotho mineworkers - served the shortest contacts (de Vletter *et al* 1981:65,71).

For all the advantages noted by First, there were also disadvantages. A labour contract of 18 months was considered in 1975 in the Report of the Inter-Departmental Committee of Inquiry into Riots on Mines in the Republic of South Africa to be too long. The report suggested the contract be limited to six to nine months with the option of remaining on (Horner and Kooy 1980:19). Whether labour time and outbreaks of violence on the mines can be more systematically related than the Report implied, awaits further investigation. Since 1977, however, there was a steady decline of miners from Mozambique, with the last recruitment of novices in 1992 (Head 1995:134). Nonetheless, those men remaining

[150] The Chamber's regular monthly analysis of black workers' earnings were recorded from at least from 1966 to 1972. These records note contracts of the following durations: 120,180 and 270 shifts and four, six, nine, 12,18 and 24-month periods (MacMurray 1978:68).

had maintained traditions established for a year or two shy of a full century, two Anglo American studies in 1986 and 1993 still showing that the labour force from Mozambique were the longest serving of all the men on their mines (Head 1995:131). The extent of illegal migrancy aside, their recruitment after a century, it was thought, would 'eventually probably cease' (Head 1995:134). This has come to pass.

5.3.11 Lengthened South African labour contracts: late 1920s - mid-1970s

Some evidence has been provided that South African miners worked shorter contracts than non-South African workers, those from Mozambique and Lesotho in particular. By 1910, however, 'voluntary labour' has become important, with mechanisms such as the Assisted Voluntary System and the Voluntary Re-engagement Guarantee introduced in 1920, facilitating this process (Yudelman & Jeeves 1986). What certainly had been recognised is that by the mid-1970s 'the average length of stay could be used as a measure of a mine's ability to *retain* labour' (Parsons 1977:33) (my emphasis).

By the late 1920s, workers from Eastern Cape districts such as Qumbu, Umtata, Engcobo and Queenstown, in the throes of drought, had 'resigned themselves to the permanence of the nine-month contract' (Breckenridge 1998:100). There were, however, exceptions. While contracts were lengthening, those of some South African workers still lagged behind. In 1927, in what Breckenridge describes as a contract that provided 'unusual benefits' (six months' duration and free return rail fares) workers at Randfontein Estates contracted from Mpondoland by the company McKenzie-Pritchard protested at the lengthening of their contracts to nine months (Breckenridge 1998:102ff). The abrupt cessation of both of these benefits fuelled the growth of a tiny local branch of the Industrial and Commercial Workers Union (ICU), tying trade union growth in this episodic case directly to a working time issue.

Official figures from the 1930s showed that the average length of stay on the mines of workers from the Transkei fluctuated over time, tending towards longer contracts. By 1931 the contracts averaged 10,8 months, which had risen to 13,6 months in 1942

(Beinart1980:101). Francis Wilson is critical of the sample of the study that Beinart draws on (sponsored by the mines in the 1950s), suggesting that the actual contract was *longer*, but that the large proportion of men from South Africa and the High Commission territories worked AVS contracts averaging 6,2 months (Wilson 1976:11). Over an individual working life, the Chamber of Mines estimated '…an average of seven or eight contracts for the work force as a whole' (Beinart 1980:100). On the other hand, based on interviews with workers who started work between 1910 and 1925, Beinart argues that these men 'went for many more spells than these figures suggest' (1980:101).

Beinart also seems to suggest that men from the Transkei preferred the shorter six or nine-month contracts as they tried to align time off from the labour contract with the ploughing season, a point often noted in the literature. These contracts translated into roughly seven and a half to 11 months' working time away from home. Mine workers from Mozambique never had this luxury throughout the period from 1876 to 1976 (Jeeves 1985:155). Workers from Lesotho, being closer especially to the Free State mines from the 1950s onwards, would have had a little more leeway, but not much, their contracts becoming progressively longer. Gaps in the record are inevitable. For the period 1934-1936 in Pondoland, Beinart (1980:102) admits to finding no patterns in the migration of labour (specifically to the gold mines).

In the absence of a dedicated and detailed account matching the length of the contract with the patterns of labour migration, it is nevertheless fairly clear that South African mineworkers served shorter contracts than non-South African labour. For a period after 1945, 'shorter and shorter contracts' were on offer to South African workers, the length of which was not specified (Crush 1992a: 54). Whatever the case, just how much longer *all* of these mine labour contracts were in comparison to other sectors in the economy was indicated by a House of Commons report on wages and conditions of African workers employed by British manufacturing firms. Migrant labour contracts in the mid-1970s in secondary industry were from two to six months (Harvey 1974: 64). To indicate just how stable the mining contract has been, in an earlier period, 1936-1943,

Philip Bonner, making a very different point, cites a study showing the extent of high levels of labour turnover in industrial sectors beyond mining. In 251 firms sampled, 50% of African workers' non-mining jobs lasted less than 12 months, with only 10% lasting for more than two years (1995:119; 2004:105).

5.3.12 South African labour contracts: the 1970's onwards

Nearly a generation later, enormous social and political upheaval and underlying economic distress characterised the 1970s, both at home and across the borders of South Africa. The ore yield of gold began to decline.[155] The Namibian contract mine workers went out on strike in 1971,[156] breaking the quiescence of the 1960s. The 'mine wages explosion' took off in this year and into the next.[157] The Durban mass strikes of 1972 and 1973 gave birth to the independent trade union movement. Violent compound confrontations broke out and lasted for 32 months and left 172 men dead.[158] The withdrawal of 120 000 Malawian mineworkers in 1974 shocked the Chamber of Mines. Figures and 'an appraisal of events' pointed to an era ended.[159] Mine wages rose dramatically and some mechanisation occurred in the stopes.[160] Frelimo came to power

[155] This continues for at least a decade: in 1987 the ore yield was just over six grams a ton on average, having been over 13 in 1970 (Jones & Inggs 1994:9).

[156] Significantly, Moorsom argues, the strike was broken by 'deliberate misrepresentation of the (marginally) revised contract system agreed at meetings' (1977:31).

[157] See Moodie (2009:47) who cites Allen (2003b) for greater detail.

[158] Wilson (1976:15).

[159] See Wilson's (1976) discussion.

[160] Wilson (1972) cites an investment of R100-R150 million. This would have related to clearing rock, not blasting the stopes. Full mechanisation was attempted in 1982/3 by introducing the Trackless Mining Mechanised Method (TM3) at various mines in the gold division of the then Johannesburg Consolidated Investment (JCI) mining group. This experiment failed. Work in the stopes is still very largely worked with hand-held machine drills, drill-rigs very rarely taking their place. The use of the current, fully mechanised, diesel-powered 'low-profile' trackless mining equipment on platinum mines has had marginally more success. In 2007 this equipment was employed in 14% of stoping operations and Anglo Platinum aimed at increasing this to 24% by

in Mozambique in 1975 and alarmed both the Chamber and the South African State,[161] while militant black South African youth mobilised just as unemployment rose and the mines made a permanent labour cut of 10%. Soweto erupted in 1976. Economic depression deepened during the same year - and in 1977, when the productive 'backbone' of the industry fractured, with only 35 000 of the Mozambican army of 97 000[162] mineworkers reporting for duty, labour productivity on gold mines immediately went into steep decline. The seeming solidity of the labour contract cracked when the Franzsen Commission's ESF was implemented in 1978 and black mineworkers took their first ever weekends off. The Wiehahn Commission sat in 1979, finally legally defining mineworkers as employees and legitimised their trade unions, stirring the long subdued passions of organised white labour.[164] Largely untested and untried, but already fully proletarianised South African workers came to the mines in considerably greater numbers.

These men were to be a different intake, a different kind of worker:

> The new workers were thus not merely proletarianised but also some of them might well have had experience in unionising industries before coming to the mines. They were certainly less tolerant of mining conditions than more traditional migrants. Thus the average length of stay on the mines for workers from South Africa (and even Lesotho) dropped off during the years of transition as the number of desertions and broken contracts increased (McNamara 1985:246, cited in Moodie 1994:243).

2011 (Stewart & Bonner 2007) which did not occur.

[161] See Horner and Kooy (1980).

[162] Crush (1995:18).

[164] See the MWU's angry response (1979).

This was ‘a more dissatisfied workforce with a keener sense of exploitation on the mines’ and ‘far more responsive to the appeal of unionism and the NUM in particular’ (Crush1992:70).

Amid all of this, in a period in which Wilson (1976:41) described the labour market as in an unprecedented state of flux, a two tier system of mine labour recruitment was advocated (in 1974 and repeated in 1978) ‘…whereby foreign labour is employed on contract and South African labour is increasingly stabilised’ (see Yudelman and Jeeves 1986:122). Crush *et al* provide a fuller account (1991). The ensuing scholarly debate on ‘internalisation’ dominated the literature, but cannot detain us here. Under the call-in card system, men returning to the mines after one month were guaranteed their same job at the same rate of pay, with both the rate of return and length of service having risen statistically from 1966 until this point in 1974 (Pinnock 1981:72; MacMurray1978:27). Shorter contracts, supplemented by other measures, were once again brought in to deal with mine labour shortages.

In this period, the 170 000 Mozambican and Malawian workers who left the mines took with them ‘skills, experience and work discipline’ (Crush *et al* 1991:152). Between 1976 and 1981, Rhodesian workers were engaged to fill the labour gap and were contracted for either 12 or 18 months, following the Chamber’s age-old practice (James 1992:39). Their minimum 12 month contracts were to a significant extent replaced by South African workers on six month contracts (de Vletter *et al* 1983:88). The Assisted Voluntary Scheme ‘became popular again’ with the restored six month contract (Crush *et al* 1991:153). The industry, with its usual thoroughness in such matters, conducted research on the effectiveness (i.e. the extent to which it encouraged workers to return to the mines sooner rather than later) of the ‘early return bonus scheme’ (MacArthur 1977).

With the turn towards predominantly South African labour in this period,[165] initially in order to attract labour, shorter contracts of 26 and 48 weeks were offered in place of the

[165] See Crush *et al* (1991:127ff).

longer 52 week contracts that had become generalised, shortly reverting to the 52 week or 12 month contract under conditions of what James refers to a 'buyers' market' (James 1992:55-6). It appears this did not last long. For the labour contract was shortly to finally very largely align with the annual cycle of industrial working time. As the labour contract aligned with the annual cycle of industrial working time in the context of an abundance of labour, this would provide the explanation for the finding of industry-based researchers who 'found men [who] claimed that they were given six-month contracts by recruiting authorities though they would have opted for longer contracts had they been offered a choice' (Parsons 1977, citing Robertson *et al* 1977:14).

The 'retention or stability' of labour was cited as a key finding in industry-based research at the time as 'still a problem': it had been recognised that 'the average length of stay worked by mineworkers has shortened' and that this was due to the increased employment of South Africans (Parsons 1977:vii & 1, citing Robertson *et al* 1976). The mining industry interpreted the severe shortage of South African workers during the mid-1970s as the attractiveness of secondary industry over mining, the lower wages paid by mining being offered as the key reason. This problem had been identified as early as 1954 (Parsons 1977:16-17). By 1976, hazardous working conditions had replaced low wages as the main disincentive for South African workers to seek out mining work (Parsons 1977:19). The strenuousness of the work and bad treatment (insults, assaults and close supervision, both in the hostel compounds and in going underground) were again reported at the time, as was the disadvantage of 'contract work', which did not permit leave of absence and sick leave privileges (Parsons 1977:21-24). As previously noted, the treatment of workers was found to be 'very important in determining a man's length of stay on a mine' (Parsons 1977, citing de Vries 1977:4).

By the late 1970s, however, the older Valid Re-engagement Guarantee (VRG) system was rationalised with four standard industry certificates on offer. Those specifying shorter contracts, having served their purpose of attracting men to the mines in a period

of crisis, were phased out by 1990, while a majority of workers had access to regular annual leave (see James 1992:29).

An empirical study further detailed the situation in a cluster of villages in the Ciskei in the late 1970s. Some men who were employed on the mines returned after completing their contracts of between six and 12 months. Others, reverting to old patterns, would repeat their contracts and be away for three years at a time. It was claimed that 'most men are at home for only a few weeks each year' (Manona 1980:186).

The transition to South African labour and the temporarily shortened contract did not last long, with the 1980s proving to be a period of 'unprecedented stability' (Crush *et al* 1991:157). By 1980 the labour contract had tightened up and functioned as a force for technically free labour, with men from the Transkei only staying at home for between one and four weeks (O'Connell 1980:278). This was the case more generally, periods at home 'now weeks instead of months' under conditions of 'greatly lengthened contract periods' (Crush *et al* 1991:152). The luxury of 'going home' had become even less affordable than in earlier years. Migrant labour, however, continues. The comment of a retired mineworker spoke of a situation that may have become institutionalised:

> …a man should never go home without a very good reason. To do so would be sheer extravagance. While at home a man loses the money he would have earned and the fares to and from work are expensive (Cited in O'Connell 1980:186).

In the pattern seen earlier, and supporting Ruth First's findings that given the possibility of extending a contract, the individual miner probably spent longer on the mines than its minimum length suggests, labour contracts were in practice further lengthened under the two-tier system: '…to 13,5 months in early 1984 compared with 8 months under the old system'. '*All* labour, local and foreign is in fact becoming increasingly stablilised' (Yudelman & Jeeves 1986:122) (my emphasis). These two authors assert that labour turnover is down, and that miners return more often and after shorter intervals. The

geographical ‘stabilisation’ the tradition refers to turns out to be a function of labour time expenditure measured by the length and regularity of the labour contract.

By this time workers from the former Bantustans, the ‘TBVC States’ of the Transkei, Bophutswana, Venda and Ciskei, no longer sign contracts. ‘The recruiting network is now a shell’ (Crush *et al* 1991:165). ‘The vast majority of mineworkers now return regularly and repeatedly to mine employment’ (Crush 1992a:63). Mineworkers began to ‘shoot straight’ (see James 1992: 69-70) and ‘simply sign on at the gate of the mine’ (Davies & Head 1995:442).

The changing patterns of migrancy in this period, cutting back non-South African labour[166] from Mozambique and Malawi, yet with rising numbers from Lesotho, saw South African workers supplying up to 60% of mine labour by 1985 (see Yudelman & Jeeves 1986). Wilmot James briefly tracks[167] the areas in South Africa supplying mine labour and specifically indicates that the mining workforce was stabilised by contracting workers for 12 months; 50% of the 1985 complement of over 120 000 workers coming from the Transkei, increasing in 1988 to 95% of workers on 12 month contracts, at this point representing over 100 000 men (James 1992:66). The following table graphically bears this out.

[166] Cutting labour in gold and coal from 73,8% from the Southern African Development Community (SADC) in 1975 (Davies & Head 1995) or 78% ‘foreign’ labour in 1973 (Yudelman & Jeeves 1986).

[167] For a fuller, chapter-length account, see Crush, Jeeves & Yudelman (1991).

Contract Lengths of Mine Recruits, 1981 – 1987(percentage of total)			
	26 Weeks	45 Weeks	52 Weeks
1981	22	59	19
1982	18	63	17
1983	14	62	24
1984	9	46	45
1985	3	40	57
1986	3	13	84
1987	3	7	90

Crush *et al* (1991:160) [169]

In 1982 the National Union of Mineworkers (NUM) was formed and in 1987, under its banner, mineworkers went out on the biggest strike in South African mining history. During negotiations the Chamber offered what had, in time-honoured fashion, often proved successful in negotiations with organised white labour, namely to increase the holiday leave allowance (Moodie 2009:59). This time it was to no avail in a strike which ended up having 'nothing to do with money', but 'was about power as well' (Moodie 2009:60). The massive retrenchments, resulting directly from the strike, were a watershed for mining employment. Now that labour could be hired directly from the queues at the gates of the mine, workers automatically became subject to the working time regime of industrial time with wages and working conditions as negotiated by workers' unions. Crush describes the effectiveness of NUM strategies in organising, where 'large blocks of workers live cheek by jowl twenty four hours a day, to great effect' in a context where 97% of miners are still migrants (1989:17). The longer periods of employment on the mines and the shorter periods of leave, James has argued, 'produced a greater commitment' on the part of workers to pursue their 'mine-related interests' (1992:82). By 1988 the one year contract was effectively in force across the industry, with nearly 70% of 'foreign' workers and over 90% of South African workers on the 'standardised one-year contract by 1990' (James 1992:29).

Labour productivity belatedly becomes a focus (Jones & Inggs 1994). Sub-contracting begins, with Bezuidenhout (2006) showing how Davies and Head's (1995) fears are realised as sub-contractors undercut union rates and their plight, including 'technically

[169] Note that the figures for 1983 do not add up to 100, but which makes no material difference to the point being made.

illegal' long working hours, comes into focus, with some sub-contracted workers working seven days a week (Crush *et al* 2001:23-24). Davies and Head's normative prescriptions and hopes in expecting support from a 'new and more sympathetic government' are rudely shattered (1995:450).

5.4 Conclusion

In the long run, predicated on the political conventions with Portugal for the export of African labour, Ruth First admirably documents the length of the labour contract which, after more than a century, very largely aligned with the temporal annual pattern of that of organised white labour - artisans and underground production supervisors - thereby dissolving at least one key industry-based institutional measure underpinning the racial division of labour. This achievement, I suggest, finally establishes a new foundation for the further non-racial exploitation of labour, now enabling the focus to shift to improving capital productivity by lengthening the 'mine-week' in order to eliminate historically unavailable surplus labour of the workforce as a whole.

The actual experience of time at work appears to have come full circle, as has the plight of the black sub-contracted mineworker shows. Where work tickets, for instance, were unfairly marked - as a 1912 report to WNLA showed - it could take up to two years for a worker to complete a contract. Almost a century later, on a platinum mining shaft, rock drill operators would go out on strike three times in 2004 to demand their annual leave, as some men had not been home for up to two years. While the unions and management - and a wayward academic - sat in the boardroom to sort out the matter, the sub-contractors flurried around the shaft offices trying to sort out the strike of a new burgeoning breed of workers: unorganised and un-unionised black sub-contracted mineworkers, the length of whose working hours are 'not generally monitored by mine management and are, therefore, not officially known' (Crush *et al* 2001:23, citing Lewis 1997:15). These sub-contracted workers almost certainly work longer hours than permanently employed unionised workers. This potentially signals a renewed round of absolute surplus value extraction. Before noting this development, however, the length of the working day itself requires attention.

6 The length of the working day

> *A preliminary condition, without which all further attempts at improvement and emancipation must prove abortive, is the limitation of the working day.*
> Marx and Engels (1975: 87)

> *I argue that Marx's conclusion of conflict over the working day follows directly from his theory of value and surplus-value … since the amount of surplus-value is determined by the amount of surplus labor, capitalists will continually attempt to increase the length of the working day in order to increase surplus labor, or will resist attempts of workers to reduce the length of the working day.*
> Fred Moseley (1997: 23)

6.1 A value-theoretic analysis of labour time

Historically, it has not proven easy to limit the working day on South African gold mines. The same can be said of the platinum mines of the Igneous Bushveld Complex. Working hours have remained remarkably stable despite massive technological developments and social changes in what has been called the 'workplace regime' (Burawoy 1985). The tenacity with which gold mining capital defended long industrial working hours was matched only by the progressive lengthening of the migrant labour contract. The question is not just why the maintenance and extension of these two forms of labour time systematically went against both local and international work time trends (only episodically noted in this thesis): it also hinges on why these two qualitatively different, racially defined, long-hour labour time regimes continued unabated. Industrial working hours were often longer than legally stipulated and indeed systematically lengthened in the case of the duration of the migrant labour contract. Why was a persistently regular industrial working time arrangement, effectively spanning a century, and the lengthening of the migrant labour contract ever necessary? For apart from the introduction of the Eleven Shift Fortnight in 1978 (which *maintained* the numbers of hours worked) and the essentially abortive first attempts at the introduction of continuous operations in 1991

(which were *never generalised*) and the BCEA in 1997 (when the three hour reduction *was often clawed back*), working hours have remained remarkably stable. The simple answer, to which this thesis addresses itself at some length, is due to the form value creation assumed and how profitability was secured in the South African gold mining industry and beyond.

In order to explain the profitability of mining on the predominantly low-grade-ore-bearing reef of the Witwatersrand basin, excavated at ever increasingly deep levels from the earliest days, low mine wages have consistently been cited as shaping labour demands (Johnstone 1976; Richardson & van Helten 1982:78; Moodie 1994:45, 2005:564). A further reason, generally insufficiently recognised, was that 'minimal mechanisation' took place underground (Richardson & van Helten 1982:85). In important respects, mechanisation has effectively remained stalled at the stoping rock face in gold mines. Even in 2007, only 14% of stopes in platinum mines were fully mechanised.

Combined, the three factors of low ore grade, the depth at which mining takes place[202] and stalled mechanisation, constitute the framing structural givens that begin to explain why local gold mining is so time-consumingly laborious. Gold mining in particular needed massive tranches of capital and a regular and plentiful cheap-labour supply working long hours to exploit what remain the largest gold deposits ever discovered. Platinum mining, like gold mining, which boast the largest reserves yet discovered, again follows suit.

In this chapter an analysis of labour time expenditure does duty in providing an explanation for the historic stability of working time arrangements. It does so by applying Eric Olin Wright's schema (1981) to an empirical examination of the relation between labour time and the creation of value in production and stresses how particular forms of social struggle correspond to the various temporal, value-theoretic components of the working day. The production of economic value is shown to be an immanently *social*

[202] A now somewhat outdated projection estimated that around 40% of gold production would be sourced from below three kilometers by 2015 (see Gurtunka 1998:1).

process. For production intimately implicates social relations. The measure of value, labour time, is likewise shown to be thoroughly *social.*

It is consequently to labour time expenditure in the mining labour process, a process physically embedded in the artificially created, spatially all-encompassing underground geological environment of solid rock, to which this narrowly focused chapter will turn. What follows further modifies Wright's (1981) analytical decomposition of the working day in South African mining.

In contextually embedding Wright's analytical Marxist schema in a specific historical and social process, at least this aspect of his work, once applied, escapes the criticism of his work being an abstracted methodological individualism (see Burawoy 1987,1995). Wright's schema is further not employed either as a Weberian 'ideal type' - as Moodie has recently done with Wright's conception of class compromise in relation to comprehending class struggle on the South African gold mines (2011). Wright's schema serves rather as a practical explanatory heuristic device, tested in this one contingent context, in what is essentially an exercise in sociological Marxism, following Burawoy (2003).

The working days described in Appendices I and II need to be borne in mind when viewed through Wright's value-theoretic lens. For they illustrate various aspects of the working day and point to the duration of a number of its various temporal components and value categories, which are, for a variety of reasons, subject to change in relation to one another. These relational changes occur in response, *inter alia*, to the environmental challenges to be met, various forms of work organisation, the structuring and restructuring of social relations in production, the skill-sets embedded in a series of occupations and the combined impact of these factors on broader social relations and social class formation.

As briefly noted, for Wright, each value-theoretic component of the working day corresponds to a particular category of labour time, which in turn corresponds to a particular form of class struggle. The creation of value in the underground mining labour

process depends on how these various aspects of the working day play themselves out in the mining labour process and its racialised construction under colonialism, segregation and apartheid, as well as in the current post-apartheid (or post-colonial) scenario.

Further, as to the relative duration of the various components of the working day, these change most especially when workers assume a greater control over production in order to win additional time off from work; paradoxically, they often shift in favour of greater (net) surplus value extraction and workers' own exploitation, an issue that is addressed in the following three chapters. The ever-changing relation of the various value-theoretic analytical categories of labour time and their temporal components occurs directly as a result of the integrated matrix of what might be termed the geologically natural ('external') and institutional ('internal') conditions resulting in the shape of the labour process underground.

The low-grade ore at depth, tackled with the rock drill, requires the breaking and removal of rock. Access is provided by either vertical shafts (on all gold mines) or either incline or vertical shafts (on platinum mines) which are broken out into shaft stations on the vertical axis of the mine shaft, horizontally developing out to a complex spatial lattice-work of haulages and smaller travelling ways leading to underground workshops, refrigeration and electrical plants, slime dams, stores and refuge bays. Off the horizontal, depending on the design of the mine, further incline and decline shafts lead to further narrower winzes, travelling ways, ore passes and the working stopes. The disturbed geology of these excavated spaces and its manifold and unpredictable impediments - falls of ground and rock bursts - constitute an unnatural set of 'external' environmental conditions. Together, all of this constitutes the working environment. The operational goings-on of this constructed underground world are controlled and administratively mirrored in the shaft offices on surface. For the miner encased in solid rock in the bowels of the earth, the footwall is 'the ground', the sidewalls 'the horizon' and the hanging-wall is 'the sky': all of which are illuminated by 'the sun' of the lamp on the compulsory hard-hat once beyond the haulages and cross-cuts, which are variously well-lit in contemporary, modern mines.

Within this 'external', quasi-natural geological environment, the social and institutional context and its shortfalls - the systemic dysfunctions of equipment failure, material and labour shortages - the 'internal' organisational life and the working conditions of mining situations are embedded. By referring to a series of examples, instances and events drawn from this institutionalised artifactual domain, as recorded in the historiographical and sociological literature on mining and direct personal experience and research, the chapter explores a potentially deeper explanatory re-reading of the astonishing narrative of South African mining, a reading couched in terms of labour time expenditure. This explanatory reading, I argue, accounts for the exploitation of labour, whether construed as 'cheap labour' (Wolpe 1972), 'ultra-subordination' and 'super-exploitation' (Rex 1974; Levy 1982), 'ultra-exploited' (Legassick 1974a) or 'ultra-cheap labour' (Johnstone 1976) and 'racial ultra-exploitation' (Moodie 2005) more adequately than doing so in terms of low wages and racial despotism.

6.2 The socially structuring character of labour time

Exemplifying the theoretical stance adopted in Chapter three, this chapter broadens Wright's schematic indications as to how his analysis can be applied in empirical investigations. I systematically view the working day through the lens of his schema and show that *all* of its components are indeed instantiated when considering the mining labour process. The anomaly at the heart of Wright's schema around *net surplus value* - which corresponds to actual hours worked within the working day and which, oddly, he does not link to a particular form of struggle (see Wright 1981:67) in social class relations - is modified in the light of empirical investigation. Wright would doubtlessly approve, given that his intention was to ensure that the 'abstract levels of theoretical discourse' around the labour theory of value should rather focus on the implications for 'concrete investigations of social life' and 'its critiques for empirical investigation' (Wright 1981:36). Wright's much criticised 'analytic' or 'categorical' stance is thus subject to and tested against historical and empirical investigation.

The seven analytically defined temporal components of the working day, their conceptual categories of labour time and corresponding forms of class struggle, are treated separately.

It should be noted that the neat analytic conceptualisations to be presented, while identifiable in the actual practices of and in the mining labour process, does not imply that these components and categories all refer to empirically discrete social phenomena. The first two analytical categories, for instance, 'physiological minimum necessary labour' and the better known 'historical and moral component' of the working day, which together constitute the 'social average value of labour power', cannot readily be separated (Wright 1983:66). The point of the analysis is to get to the bottom of how value is created in the mining labour process. For therein lies the explanation of the two historical sets of facts outlined in the previous two chapters: long industrial working hours with virtually no reductions in working time, and the ever increasing length of the migrant labour contract.

In order to analyse value creation in production, the relation between time and the expenditure of labour-power needs to be shown, most especially the central role 'direct labour time' plays in the production of net surplus value. For, without the application of direct labour time, there is no produce to constitute economic surplus under any social and historical configuration, let alone capitalist profit, nor is there anything to 'transform' into exchange value in the capitalist market place. This is the fundamental assumption of my thesis. This is not to deny the role played by extra economic and political factors in this process; my focus is the genesis of *value* in production under capitalism, not the historical, social and political conditions for it. A further assumption, of course, is the propertylessness of workers which brought them into capitalist 'hidden abode' of production in the first place where value creation is initiated under given social conditions.

The central point, as argued in preceding chapters, is that labour time expenditure is responsible for the creation of the entire panoply of human production. More specifically here, that portion of the working day *directly* responsible for the creation of net surplus value is the quintessential source of actual wealth, to which, under capitalism, the rest of the value chains emanating from it are initially subordinate.

More than that, as posited in Chapter three, the expenditure of labour time *per se* is responsible for powerfully structuring social relations, including changes in the composition of and relations between social classes, evidence for which the previous chapter presented. Two very brief *vignettes*, both illustrating and instantiating the fundamental social structuring capacity of labour time, are now first presented, prior to engaging with Wright's schema.

6.3 Labour time expenditure and class formation

As we have seen, in the context of generalised labour shortages, the *retention* of South African mine labour occurred by lengthening the labour contract. In the early years of the industry, African workers constituted an undifferentiated mass of unskilled 'muscle power' and were viewed as 'muscular machines' (Katz 1995:472). Mine workers who had served 'relatively lengthy contracts' and were likely to have been sufficiently skilled to earn a blasting certificate, based on experience born of the length of their service, are noted as early as 1905 (Katz 1995:479). A Cornish mining engineer thought that 'natives' should in fact 'be bound to masters for say seven years' - precisely to develop the skills mining requires (Marks & Rathbone 1982:15). African workers were, however, to learn their skills informally, without such apprenticeship. The time some workers spent renewing their contracts gave way to the recognition of the value of workers of differential levels of skill. These men were the early 'long-service African' workers, largely from Mozambique or Basutoland (later Lesotho), who worked longer contracts than other workers, and whose long-term labour time contribution changed managerial definitions of them and in the case of 'boss boys' (later housed separately under better conditions in the compounds) altered their relations with their peers.

Apart from those who assumed changed social roles on surface as previously noted, in the organisation of production, these 'long-timers' began to occupy increasingly skilled leadership positions as 'boss-boys' - later called 'team leaders' - with their occupational status and both inter and intra-social class relations changing accordingly. The socially constructive capacity of labour time is shown in that those working repeated labour contracts represented the first division in the social mass of proletarianised 'muscle power'

of an African proletariat. These men came to be differentiated from the African mine labouring masses by the *labour time* they had spent on the mines, by virtue of which they ended up doing clerical and more skilled work underground. Not much is known about this proletarian, temporally constructed, productive vanguard. For such selection was, however, not much more than 'mere chance', with the 'black labour force … regarded largely as an undifferentiated mass of interchangeable units' until selection and grading and the training of recruits after 1945 (Wilson 1972:94). The significance of this social grouping of mineworkers, however, is not merely that they represented specifically identifiable and more highly skilled intra-working class social groupings in terms of their occupational and social roles, but that this distinct group of men signalled either greater economic value or social value (in terms of exercising social control functions) within the echelon of a previously homogenous labouring mass of unskilled, uneducated and disenfranchised African workers. This social phenomenon relates directly to labour time expenditure. Changes at the level of social formation, racialised legislation for instance - promulgated to prevent legal recognition of their *de facto* skills - resulting from white working class struggle, followed this development. The point is made simply to note that further investigation of the relations between the temporal rhythms and patterns of productive labour, its social distribution, the resulting social relations in and of production and social class formation may well need to be couched and consequently explained in terms of sustained labour time expenditure.

6.4 Labour time expenditure and race

> *What worries me is that I have been so long in this mine and now I am beaten. No boy down there has any value at all: they are simply licked by the Europeans.*
> An African worker in 1913 (cited in Breckenridge 1988:683)

The following sliver of evidence for the structuring character of time and labour time was encountered later historically than the quote above. It was evident that, from having spent time on the mines, many white supervisory workers, 'shift bosses' in particular as Breckenridge (1988) recounts, developed a highly ambiguous personal relationship with

the African ‘boss boys’ who commanded ‘their’ crews of labourers, and whom they got to know at a personal level, albeit within the strictures of a racialised production environment and society. ‘Unlike most other African workers, these senior workers were on the mines for very long periods of time, and their relationships with their white bosses were enduring’ (Breckenridge 1998:688). These relationships clearly resulted from the duration of the labour time expended over years in the underground workplace. Photographs of these black mineworkers at a *braai* at the modest mine-owned houses of white working class miners in the ‘white’ suburbs have been seen, and could potentially be sourced as evidence of this singularly unusual, but quintessentially social interaction, however awkwardly representing what Breckenridge describes as ‘a strange form of mutual recognition between white and black workers’ (1988:693). Such photographs observed (but not procured) bespoke aspects of joint pride, paternalism, and occupational and racialised social distance.

Such social relations, however, born in production out of labour and time in this instance, inevitably proved to be still-born in terms of issuing in working class organisational solidarity across the racial divide, or perhaps even in terms of constituting genuine social relationships. Would their respective wives have had anything to say to each other, presuming they even shared a language? This relationship between white miners and their experienced and temporally seasoned team leaders increasingly assumed a social dimension as the team leaders had assumed the *de facto* role of miner, of which the white miner was all-too-well aware. For the team leaders earned him his bonuses upon which his more privileged lifestyle depended, one Cornelius Oosthuizen, for instance, having had only ‘three personal boss boys’ spanning a sixty year working career on the mines (Breckenridge 1998:688).

The structuring of racialised social relationships, due to the time-worn labour of ‘boss boys’, occurs more broadly than the mines. Phillip Bonner shows how ‘boss boys’ were not only ‘the key intermediaries’ between job seekers and employers beyond the mines, but that ‘their mastery of a particular kind of racial workplace etiquette, often learned on the farms or the mines, was also deployed to circumscribe the arbitrary behaviour of the

foremen through fashioning of a kind of moral economy on the factory floor' (2004:104). There is scope for much research in this regard.

6.5 Eric Olin Wright's value-theoretic schema

Attention now turns to Wright's schema below. For the sake of clarity I provide illustrations of this complex schema, which remains open to modification and adaptation. Nonetheless, when applied to an actual labour process, it reveals fairly precisely under what conditions, within the course of the working day, surplus value is extracted or not.

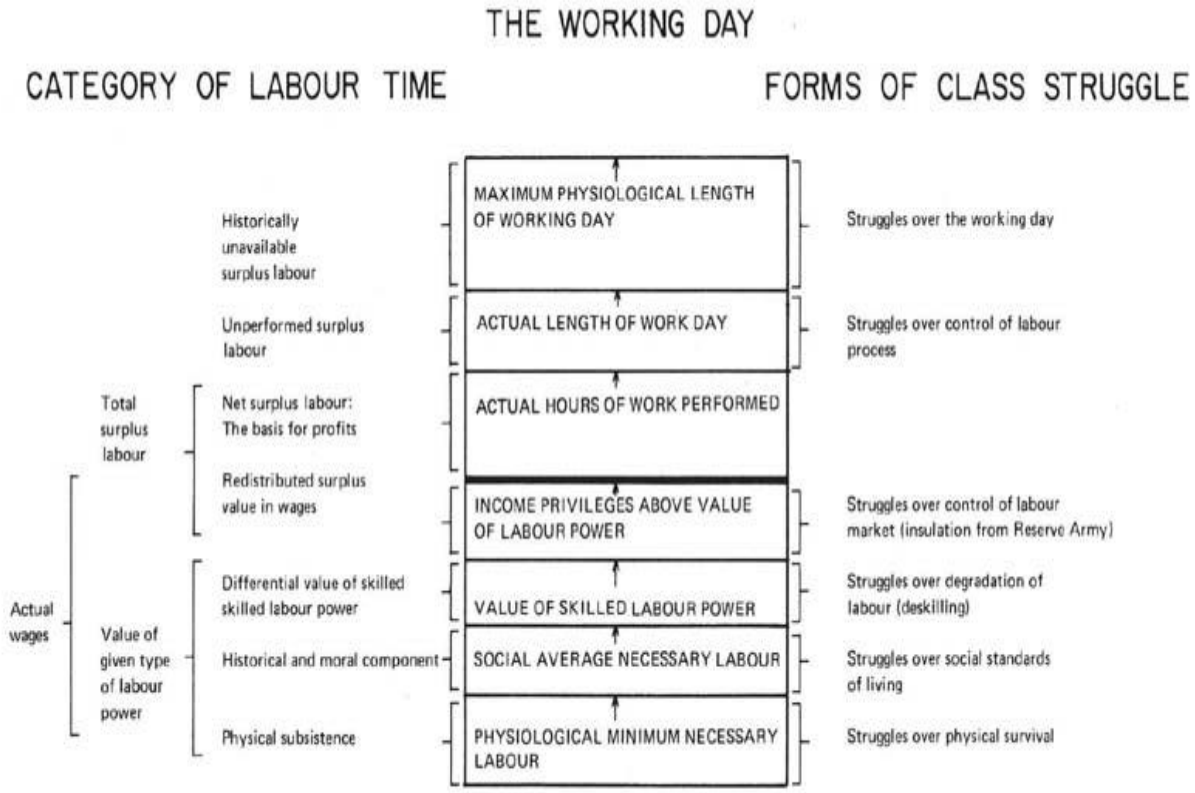


FIGURE 7
Decomposition of the Working Day into Value Components

It is not to be inferred from the analysis to follow that *value* (which Wright generally

refers to as surplus labour) can be atomised, but rather that its *genesis* is thereby instantiated and that value is shown to primarily be the materially productive social relation which it constitutes. Value *per se* is further intimated not to be the metaphysical construct Joan Robinson (1966) considered it to be (see de Vroey1982), but is rather the material stuff of productive human relationships. For this is its genesis, its real origin, whether or not, as has been argued, value is both a 'sensible and super-sensible' reality and that 'strictly speaking 'value "is a ghost" ' (Bonefeld 2010:266, citing Bellofiore 2009:185).

The disputed ontological character of value aside, in the close focus to follow, Wright's analytic decomposition is applied directly to the underground mining labour process. This analysis illustrates the range of aspects regarding the application of labour-power in the course of productive work, when *actual* value-creating work is being performed, when value is not created and what portion of a worker's time is not historically available to the capitalist for exploitation, i.e time for recuperation.

By using a 'time use data' method, of course, the working day could, in addition, be very precisely divided into its quantitative temporal components (Glorieux, Mestdag & Minnen 2008; Tijdens & Dragsta 2007). The control and 'waste' of time would consequently be 'made visible' (Bell 2001:45). Such analyses would have significant implications for workers and supervisors who decry the waste of their labour time, as well as for the more efficient and genuinely productive management of time in industrial concerns.

Wright, in his own words, considers it helpful to 'systematically decompose the working day into a number of sub-components' (1983:41). Surveyed over the course of historical time, this will reveal how the exploitation of labour power - and consequently the magnitude and rate of surplus value measured by the application of both direct and indirect labour time - occurs at the level of the social relations in the labour process and beyond, is facilitated at the institutional and organisational level of capitalist enterprises and how, in turn, exploitation is mirrored in broader societal relations.

Applying and testing Wright's analytical schema will serve to illustrate how, by viewing mining through a disaggregated conceptual lens of labour time, a variety of aspects of the organisation of work and relations *in* production and social relations and struggles *beyond* it are shaped by labour time expenditure. This analysis will form the basis for explaining workers' laments regarding the dysfunctional aspects and degree of *disorder* noted in manufacturing (see von Holdt 2003) and which characterises much of mining production. Further, the analysis will provide the necessary background to understanding how workers have latterly sought to improve their own productivity (the dedicated topic of Chapter nine), thereby increasing net surplus value. It will also account for the stable, long working hours workers spend in the mining labour process underground.

In the light of Wright's analysis, the necessity of particular forms of social relations required to regulate production, supervision for instance, is illuminated. In comparison with the situation of the closely-timed industrial worker under capitalism generally, the relative autonomy workers in local mines share with miners elsewhere (see Ochs 1992:281ff) also comes to light, the rigours of the job notwithstanding.

To recall, Wright decomposes the length of the working day into a series of temporal and value components and categories of labour time, and a series of immanently *social forms* of class struggle. The component of *actual hours of work performed*, corresponding to the category of *net surplus value*, Wright does not, as noted, associate with a form of class struggle. This matter receives separate attention later.

Regarding his schema, Wright (see 1981:65-74) argues that his analysis underpins many 'empirical studies of the labour process and class struggle' (1981:69). He further notes that these studies had not 'explicitly taken as their point of departure this entire schema' (1981: 69). He briefly provides a number of indications in this regard.

Wright suggests the most obvious insight resulting from his schema is how *struggles over the working day* revolve around the *maximum physiological length of the working day* and

are struggles over *historically unavailable surplus labour*. Regarding (historically) unavailable surplus labour, I quote Wright in full:

> The maximum possible amount of surplus value technically possible, given a particular value of labour power is represented by the physiological maximum length of the working day. With extremely rare exceptions, the actual working day is much less than this. The difference between the two constitutes an historically unavailable quantity of surplus value (1981:69).

The struggle over how much social time can feasibly be devoted to labouring, and how much time is simply not available and cannot be accessed for the purposes of production, is the struggle over the length of the working day. Historically, the fundamental conflict between capital and labour is initiated by this struggle (Marx 1977; Roediger and Foner 1989). (The 'labour-time wastages of the migrant labour system', to take a single pertinent example from the local historical record, were cited as a key reason for the *advantages* of the policy of industrial decentralisation in South Africa in the 1940s (Legassick 1974a:17). 'Wasted' labour time, commuting in particular in this instance, as will be seen when the empirical evidence is treated, has a direct bearing on how the new generation of mineworkers and miners, both male and female, respond to the length of the working day underground when commuting is added to the formal length of the working day, i.e the hours actually spent at work. Workers will also be seen to decry wasted time *within* the working day.)

In Wright's analytic schema, *struggles over the control of the labour process* relating to *the actual length of the work day* 'determine' the amount of *unperformed potential surplus labour* in the working day (Wright 1981:69). Obviously, not every minute of a day spent at work is spent *actually* working!

The capitalist labour process has been the focus of much work: Wright, for instance, reads Braverman's (1974) 'deskilling thesis' and the separation of conception from execution as, 'at root', the matter of reducing unperformed surplus labour (1983:69). For Wright, the component of unperformed surplus labour also underlies the 'securing and obscuring' of

surplus value extraction in Burawoy's Marxist theory of the capitalist labour process and his celebrated 'manufacture of consent' thesis (1979) which explains workers submitting to their own exploitation by playing the 'game' around production targets and rewards. Wright further suggests unperformed surplus labour also underlies Edwards' (1979) analysis of capitalism's 'contested terrain' in which workers and management vie for control over the labour process. Locally, too, much thought and work, initiated by Eddie Webster's *Cast in a Racial Mould* (1985), has been devoted to analysing the labour process. In fact, this chapter can be read as providing a deeper analytical reading of how surplus value is extracted in the capitalist production process, initially theoretically outlined in the South African context in Webster's seminal text (1985:4-6).

The temporal component of what Marx and the literature generally refers to as direct labour time or, in Wright's terms, the *actual hours of work performed,* is responsible for the profit-making category of *net surplus labour*, or value-creation *per se*.

What constitutes *total surplus labour*, it should be noted, is the number of hours actually worked *over and above* the sum of the following four analytical components of the working day: *income privileges above the value of labour power; the value of skilled labour power; socially average necessary labour;* and *the physiological minimum necessary labour.*

The first of these four components relates to what Wright considers to be the most complex analytical category of labour time in the working day: the 'income privilege' of *redistributed surplus value (in wages)*. This component of the working day, for Wright, represents income 'kept *permanently* above the value of labour-power' (1981:66) (my emphasis). Social struggles over internal labour markets, which are insulated from the reserve army of labour, he suggests, result in wages or salaries being paid (permanently) above the value of labour power. This occurs by restricting access to particular jobs, either by labour unions or by managerial strategies relying on internal recruitment and promotion procedures. Much of the literature around labour markets, which are 'complex and concrete (and shifting) categories that incorporate a full range of socioeconomic

relations, structures and tendencies' and need to be understood in terms of an 'analysis of capital' and 'a critical application of the categories of political economy, not least that of value theory' (Fine 2007:128) implicates this component of the working day. This component relates specifically to Wright's analysis of those located in a 'contradictory class location': supervisors, foremen and manager-employees, responsible for commanding production, who all partake of redistributed surplus value by way of bonuses, share option privileges and a range of emoluments over and above their contribution to actual production when measured in terms of the value of their labour power (see Wright 1978). This component is deemed the most complex for Wright, due to the role wages play in strategies of *social* control. While the redistribution of surplus by capital cannot be said to be 'permanent' as Wright avers, white workers (as will be seen) continue to benefit from such *racially* distributed surplus, but which is being whittled away by attrition as black workers replace white workers who continue to exercise a significant measure of control over the labour process.

Secondly, struggles over the *degradation of skills* ('deskilling'), Wright indicates, 'directly affect' the category of *differential value of skilled labour-power* (Wright 1981:73) and relate to the contribution to the working day of the labour-value aspect of *skilled labour power*. Where craft gives way to the less skilled industrial worker, or where certain jobs and occupations become obsolete or redundant due to the introduction of new equipment and machinery, differentiations in skill of the working class as a whole collapse or disappear. While the mechanism is the immediate 'de-skilling' of jobs, the overall result is a degradation of autonomously performed work generally under capitalism. While not noted by Wright, it should be added that new, but qualitatively different skill-sets, competencies and occupations come into existence; these correspond to freshly emerging differences in skilled labour-power, whether manual or mental, introducing an entire terrain of work-related phenomena and analyses, the very existence of which can only be noted here.

Thirdly, struggles over the *social standards of living* relate to the more commonly known *historical and moral* or *social* component of the working day, which, for Wright,

corresponds to *socially average necessary labour* (Wright 1981:73). Where such struggles take place in advanced capitalist societies, higher standards of living can be granted via international transfers of surplus value from developing contexts. In the South African mining context, it will be argued, such transfers cross the racial line in a working class that has 'historically been divided' (Marks & Rathbone 1982:2). Racialised struggles in the South African context have resulted in a bifurcation of this component, as a reading, by these lights, of the first two chapters will reveal. Very recent work on the contemporary situation on a gold mine bears this out (Phakathi 2009, 2011).

Fourthly and finally, writing out of the context of advanced capitalist societies, Wright does not mention the component that, alongside the historical and moral component, constitutes *socially average necessary labour*. This is the final component of his schema, but of course, both logically and practically precedes the other components, i.e the amount of *physiological minimum necessary labour* required to often but barely sustain and reproduce the worker - long considered in mining to supplement the mine wage from the rural reserves (Wolpe 1972). Wright has noted that in advanced capitalist societies, wages are generally 'well above' this level (1981: 66). Representing struggles over *physical subsistence* and survival, this component applies all too starkly in the context of the South African mining industry and attracts special attention in what follows.

More critically, it should be noted that Wright's analytic schema must not be taken as one which is static. Wright's correspondence here between the 'historical and moral' (social) component and 'physiologically minimum necessary labour' as constituting what he refers to as 'socially *average* necessary labour' takes into account how the amount of socially necessary labour time changes as it is 'determined by various circumstances', of which it has been noted that Marx mentions six such determining factors (1977:47).

For Wright, the final three categories of labour time, *the differential value of skilled labour power*, *the historical and moral* or *social* component and work performed to ensure *physical subsistence*, constitute the value of labour-power of a given type. In the discussion that follows, the costs of labour-power have implied a focus on the cash wage.

Additional costs of food and accommodation of compounded workers in the early period or the costs of living out allowances and Provident Fund contributions by employers have not been noted. A separate study would be required to calculate the *actual* costs representing the value of labour-power and would need to include all such relevant factors and has not been attempted in what follows.

In more general detail then, Wright's (1981) sevenfold schema is treated in the sections which follow:

6.5.1 Physiological minimum necessary labour

Wages are the expression of labour time. The cutting and depression of wages and the stretching of the labour contract by whatever means, was endemic to mining for much of its life and remains the key mechanism for decreasing socially necessary labour time and the depression of the value of labour power.

For migrant mineworkers in the early period in mining, wages hovered around subsistence levels. In the early years, where wages dropped below what was socially necessary for subsistence, workers either absconded and deserted or did not take up labour contracts (van Onselen 1980). For the industry the conundrum was at what level to pitch wages, specifying this aspect of minimum socially necessary labour. For, to repeat, it is physiologically necessary labour, plus the moral and historical component, plus the differential value of skilled labour power that make up the component of necessary labour, the (differential) value of labour power. Paid as wages, where the two latter components can be eliminated, all the better for reducing the value of labour power and the wage-rate in order to enhance the surplus extracted.

For the early African proletarians the struggle corresponding to this component related directly to struggles over physical survival, as Wright's schema contends. Something

similar has been said regarding the plight of poor white workers whose families suffered 'broodgebrek'[203] as late as the 1960s (Visser 2008).

More formally in terms of Wright's schema, physiologically minimum necessary labour is an aspect of the value of labour power: the 'amount of labour time it takes simply to reproduce the direct producers at a minimum subsistence level' (Wright 1981: 66). As we have seen, Wright has suggested that in advanced capitalist societies, wages generally are considerably above this level; but the same cannot be said for the newly proletarianised mineworkers, whether African or Afrikaner, in the late 19th and in the early and up until the middle of the 20th century. These workers faced not just ensuring the *social* reproduction of their families and communities, but the prospect of not *physically* surviving the rigours of mine work, due to death at work (Katz 1994; Leger 1991); violent conflict on the mines (Moodie 2005a; Breckenridge 1998), through 'faction fights' (Moodie with Ndatshe 1994; Moodie 2005b), criminal gang violence (Kynoch 2000) or rampant disease (Packard 1989; Katz 1994, 1991). As happened to the craft miners of old a century before them (Katz 1976:75), recent research shows how mineworkers are 'medically boarded' by the industry and generally simply sent home to die if they are found to have either contracted HIV/AIDS or a form of pneumoconiosis (Roberts 2009).

The fact that African mineworkers went out on defensive strikes against wage cuts or for not having received rations (the proportion of workers' wages spent on food always being greater than the average portion of income in comparison with other social layers) points directly to a struggle for subsistence survival (van Onselen 1980:218ff). It was the labour of 'the poorest' that was crucial for the industry's survival. 'By supplying cheap immigrant labour', van Onselen writes, 'drawn from the poorest ranks of the peasantry *and bound by long contracts,* it assured the mining industry of its minimum labour requirements,[204] and placed employers in a position to undercut all black wages' (1980:25) (my emphasis).

[203] A shortage of bread.

[204] What van Onselen must be to be seen as referring to when he uses the phrase 'minimum labour requirements' is both the absolute numbers of workers and the time they spent on the mines. The

Arbitrary wage cuts and reductions were endemic in the early years of mining and applied equally to white workers (Katz 1976). They are not unknown in the contemporary period and are generally effected by arbitrarily cutting bonuses and wasting wages by only granting below-inflation increases or by granting inflation-linked wages in the context of soaring food prices. These cuts amount to 'testing' the ever-fluctuating value of socially necessary labour and pushing it down to (or below) subsistence levels, thereby eroding any gains made in the struggle over the historical and moral component of the working day.

A generation ago Martin Legassick suggested that the mining industry 'tested' the price of cheap labour - in other words, attempted to establish this key component of socially necessary labour by the manipulation of wages to see how far they could be depressed (Legassick 1974c:15). Regarding the 1930's, Legassick and Hemson go as far as to say that the wages of black workers, representing the value of their labour power - or what we have more carefully called here, following Wright, the physiological minimum necessary labour that constitutes the value of labour power in this instance - were pushed to *below* subsistence levels due to some degree of subsidisation of wages via the rural reserves as Harold Wolpe (1972) so famously argued. As the literature has long argued, when the physical survival of workers was threatened, due to wages being so depressed, workers simply deserted the mines. Meanwhile, white workers were in no position to contest the value of their labour power, strongly suggesting the barest of subsistence[205] wages (Legassick & Hemson 1976:5).

Francis Wilson's work (1972) showed how black mineworkers' wages did not increase in real terms from 1911 all the way through to 1969, strongly suggesting that the value of African mineworkers' labour power remained at bare subsistence levels for a significantly large part of the industry's life. According to another account, in 1971 'Black miners'

acquisition of labour via forms of extra-economic coercion and the retention of labour, by lengthening contracts and not reducing working hours, needs to be distinguished.

[205] Establishing social indicators such as a Poverty Datum Line (signaling subsistence levels) or the Human Development Index (signaling measures of social progress beyond mere subsistence) is a task for economic social science not addressed here.

wages had hardly changed since 1944', while those in manufacturing had trebled and white miners' wages 'more than quadrupled' in this period (de Vletter 1981:91).

The 'Living Wage' campaigns of COSATU in the late 1980s equally suggest that workers' wages were not much above subsistence levels, or show, at the very least, that these struggles over social standards of living, initiated by the then relatively newly emergent independent trade union movement, related to the historical and moral category of labour time. The contemporary recent focus on 'Decent Work' points in the same direction, the classical (and broader) formulation of which, this thesis now turns.

6.5.2 Historical and moral (or social) component

> *In contradistinction… to the case of other commodities, there enters into the determination of the value of labour power a historical and moral element. Nevertheless, in a given country, at a given period, the average quantity of the means of subsistence necessary for the labourer is* ***practically*** *known.*
> Marx (1977:168) (my emphasis)

This category of labour time, in any socio-historical context, is never known *a priori*. It has to be *established*, and relates to 'struggles over social standards of living' (Wright 1981:66). Constituting forced, disenfranchised and socially disadvantaged labour, African workers proved to be in no position to improve the social average of their wage to incorporate a moral and historical component within it. If socially necessary labour is 'practically known' and born out of tradition for Marx, then these traditions had first to be initiated and established in the historically conjunctural setting above and below the *veld* of Paul Kruger's old Transvaal.

White artisan craft unions, for instance, 'again and again' faced wage cuts or increased working time at old wage rates (Katz 1976: 30). To illustrate Legassick's contention that the value of labour power is 'tested', mine owners in exile during the South African War considered a 'white labour experiment' that 'involved testing the levels of intensification and cheapness at which white unskilled labour could be employed' (Legassick 1976:15;

see also Katz 1976; Davies 1975). This would have applied to Afrikaner *bywoner*[206] and other 'poor white' social groupings undergoing the process of proletarianisation from 1886 through to the 1930s (O'Meara 1983: 24). Working miners, standing on the cusp of this impoverished reserve army of labour, struck in response to increased supervisory duties,[207] resulting in the formation of the Transvaal Miners' Union. This was the first 'specifically miners' union' (Legassick 1974c: 15) or in other words, an industrial, as opposed to a craft union, clearly established to protect miners' social standards of living, a struggle corresponding to *socially average necessary labour* and its historical and moral (or social) component *a la* Wright. Implicating the next analytical category to be discussed, surplus value was thereby redistributed *racially* and subsequently strenuously defended by the practice of a 'colour bar' in 1896 under colonialism, legally entrenched in 1924 under segregation and maintained by a raft of further legislation throughout apartheid until 1988. It is currently defended administratively, as a last hurrah under democracy, by the continued dominance of a close-knit, predominantly Afrikaans-speaking white mining community who continue to hold on to the complex body of experiential, cognitive and practical organisational skills necessary for 'reading the mine' to thereby keep them going.[208]

Dunbar Moodie's analysis of the 'maximum average system' must explicitly be read in terms of ensuring a depressed value of African labour power - or more precisely the social

[206] Generally poor rural tenants.

[207] Increased supervision 'diluted' white workers' 'skills'. Apart from the value of socially average labour, the value of skilled labour power is implicated here. This is but one instance where separate analytical categories are instantiated in the same empirically identifiable moment.

[208] I cite but one example in support of this claim, worthy of sustained inquiry. An electrical foreman had retired after over 30 years in the industry, having ended up in a training centre responsible for crafting the architecture of training programmes and organisational systems. Seven years later, tired of being pestered to return as a consultant and by a never-ending string of work-related calls to his home, he gathered together and collated and loaded his entire practically based working career onto two discs and sent it off to the mining company with a note not to be further disturbed. He had taken a significant chunk of indispensible institutional memory with him upon retirement, without which the mining company could not function properly.

average value of such labour power (2005). This system stipulated a maximum average wage above which African mineworkers (except for rock drill operators, the significance of which becomes evident in Chapter nine) could not be paid. This banned competition between mining houses in the chase for the acquisition of cheap mine labour. This system was in place from 1913 until it was 'abandoned in the 1960s' (Moodie 2005:547).

Though disenfranchised, in the 1940s an attempt was made to organise black workers to improve their standards of living. The unrecognised AMWU certainly failed in this endeavour (O'Meara 1979; Moodie with Ndatshe 1994:243). It was only with the dramatic increase in African mine wages in the turbulent early 1970s that wages were improved, primarily to attract local South African workers from the 'rural settlement slums' and the Zimbabwean townships, as well as additional workers from 'traditional sending areas' in the Transkei and Lesotho (Moodie with Ndatshe 1994:241). Wages, importantly for the argument here, had been a '*non-negotiable* aspect of the informal moral economy of the mine' (Moodie with Ndatshe 1994:243; see also 241ff) (my emphasis). It is no accident that, with black workers' wages increasing exponentially during this period, it does not take long for the industry to make the call to include them in the industrial relations system, not least to legalise their status in production and begin the process of deracialisation in order to *increase* the value of their labour power to *decrease* the unperformed surplus labour of these workers (see below) by recognising the *de facto* differential value of the skilled labour power the team leaders, in particular, had accumulated. Increasing the value of black workers' labour time, in other words, led to weakening the old racialised occupational hierarchy on the mines.

From around 1971, mining capital was forced to raise wages above the traditional physiological necessary minimum in its bid to employ local South African labour. These entirely wage-dependent urbanised workers were not prepared (or able) to work for the lower wages earned by the previous migrant labour force:[209] their costs of social

[209] In 1974, non-South African workers made up 72% of the overall labour force (James 1992:35). Of this number, two years before, in 1972, Mozambique and Malawi supplied 67% (James1992:36), down to 53% the next year (de Vletter 1987:202). Roughly a decade later,

reproduction exceeded those of the migrant miners. Further, significant proportions of these workers had previously been employed at higher wages in manufacturing, including some who were acquainted with trade union organisation and attuned to a different tradition of struggle over the value of their labour power (Moodie with Ndatshe 1994:242-3). The result was the inclusion of a historical and moral (or social) component or addition to the wage in general when the supply of non-South African migrant labour fell off in this period due to well known reasons: the Malawian air disaster, after which Hastings Banda recalled his mine-working countrymen, and the Mozambican revolution the next year. Further, the rescission of the Masters' and Servants' Act removed desertion as a criminal offence for black workers (in order to free up the movement and hence the value of African labour more generally in a racialised society), thereby removing a powerful form of social control to retain workers on the mines (Moodie with Ndatshe 1994:242).

In this context 'mine wages *per se*', it was suggested, 'may not, or may barely, cover the costs of reproduction' of mineworkers and their families (de Vletter *et al* 1981:63), strongly suggesting that *despite* the increased wage levels in general, they remained for the new urban-based cohort of workers at the physiological minimum necessary subsistence level. The immediate upshot was, as previously noted regarding a rare moment in the interruption of the systematic lengthening of the labour contract, that the average length of stay on the mines of both South African and Basotho workers dropped off as shorter contracts were instituted to entice workers back to the mines, while desertions and broken contracts increased (Moodie with Ndatshe 1994:242, citing McNamara 1985:246). These events set the tone and represented the beginning of a fundamental shift in mineworkers' struggle over living standards over and above the physiologically minimum necessary labour of the migrant labour cohort, i.e. the historical and moral or social aspect of waged labour.

workers from these two countries only supplied 12,5% (de Vletter 1987:202) of the total mining labour force.

For the first time since the inception of the mining industry and long prior to the permanent unionisation of African workers, via a marked escalation of worker-management confrontations from 1974 to 1982, predominantly South African workers pressed for an improved standard of living. The industry interpreted this by suggesting that 'a more sophisticated man is entering the gold-mining industry' and that 'improvements in work and hostel conditions' needed to be 'maintained' to 'retain the services of this higher calibre man' (Chamber of Mines 1977, cited in James 1992:98). It was these men who, as late as 1983 (James 1992:20) eventually broke through the long-sustained depression of the imposed 'maximum' social average value of the labour power of mineworkers (Moodie with Ndatshe 1994:241ff). Even then 'real wages only improved marginally', shortly to be confronted with a downward pressure on wages due to the oversupply of labour (James 1992:20). This 'moral and historical' or social component of the wage can be read as the demand for a 'living wage', which was then built on through later wage struggles after the recognition of the NUM as legitimate representative of still formally politically disenfranchised workers.

The introductory analysis presented thus far enables a closer conceptual linking of well-documented accounts of mining capital's labour requirements and the hitherto largely overlooked role of necessary labour time expenditure, the diminution of which is critically responsible for both mining capital's accumulation and the extension of which is the aim of social struggles for a better life beyond mere physical survival and the minimum basic standards of life that emanate from it.

To sum up, following Marx, the historical and moral (or social) component of the working day is central to and the result of successful struggles, which then becomes expressed socially as *de facto* established traditions. It represents the difference between bare subsistence or physiologically necessary labour and what has been gained, via social struggles, above this level. Hence this component corresponds to struggles for social standards of life over and above the bare basic necessities for physical survival as Wright's schema contends; it is *practically* known, as a result of struggles, in contingently specifiable historical and social contexts.

6.5.3 Differential value of skilled labour power

Skill, *per se*, has no objective measure and is socially constructed. It is difficult to define skill clearly in a mining context (Katz 1999:77). This is very clear when applied to the South African gold mines (Katz 1976:55, 1995; Webster & Leger 1992). In the international literature the term miner - after both the advent of the 'all-round miner' and the mechanisation of hand-drilling - came, in the American context, to mean 'one who drills, blasts, stopes, drives levels etc. in a mine' (Hovis & Mouat 1996:455). Initially, of course, in the 1890s on the South African gold mines, the hard-rock mining skills of white miners with trade union experience, who enjoyed 'considerable' bargaining power, were in short supply. These workers had to 'be lured' by high wages, yet despite their relative strength, they worked seven days a week (Marks & Rathbone 1982:17; Richardson & van Helten 1982).

Already in the early years of mining 'skill and skin "whiteness" tended to coincide', before, by dint of workers' labour time, 'persons of "colour" increasingly gained experience and acquired proficiency in mining tasks' at which point the 'so-called "skilled" status of miners became an increasingly artificial and racially based construction' (Katz 1995:469). The key skill underground was constructed around the blasting certificate by the 'informal customary colour bar' in 1896 (Katz 1995:469); a 'statutory colour bar' in 1911, legally entrenched in the Industrial Conciliation Act of 1924 (1999: 84) and further legally entrenched by way of 'job reservation' in 1956. Mining labour was only finally officially de-racialised over 70 years later, in December 1988.

By 1988 black team leaders had long been blasting the rock faces (Moodie 1976; Leger 1986). Even the official descriptions of the job of these men (then called 'boss boys') was 'limited' (Hewitt 1973:42), there being no 'formal task description (or task analysis) of the enlarged job of the SPTL[210] on an industry wide basis' as late as 1981 (Momberg 1981:1).

[210] Stope Production Team Leader, previously called 'Boss boy' - as Shift Overseers were previously known as 'Shift bosses' and Mine Overseers were referred to as 'Mine Captains', the highest occupational position underground, on appointment to which men would start wearing a

This job included executing safety procedures, a job learned informally underground over time. Chinese 'boss boys' and unskilled Afrikaner workers, working as unqualified white 'machine-helpers', had similarly learned these skills, famously enabling management to break the 1907 white miners' strike (Katz 1976:138-9).

The whole struggle focused on race was in large part a struggle over the differential value of skilled labour power. For the white workers, applying Wright's schema, it represented the final capitulation of their struggle over the gradual erosion and degradation of their skill at the point of production. While the extent of the 'deskilling' and degradation of white workers' labour power has been exaggerated, as the following section will show, these workers go on, again as Wright's schema contends, to wage a struggle for control over the labour market, by ensuring increased income privileges above the value of labour power, as they locate themselves, largely on a racial basis, in the offices of the mines on surface, from where production is superintended, supervised and controlled.

The major aspect of underground mining is still learned very largely informally, formal training providing but a preparatory and basic introduction to actual competencies picked up through on-the-job training underground (Webster & Leger 1992). Before 1899, for instance, for an untrained miner to obtain a blasting certificate he had to stay with a trained 'machine-man' for 'a certain length of time', an informal 'haphazard' process that was open to abuse; skill being 'ill-defined' despite the necessity of a compulsory trade test (Katz 1976:57).

In my own experience, almost exactly 100 years later, many miners and shift overseers remain dismissive of the 'mine school' or mine-based training centres, appealing to their own years of experience underground.[211] Practical experience and knowledge, born of time

tie to work, signaling their having joined the ranks of management.

[211] Go to any mine and you do not have to look far for a seasoned miner, shift or mine overseer who would say something like: 'Forget what you have heard in the training centre. Here you do as I say!' On the other hand, there are training programmes and trainers that impress and which workers genuinely appreciate. (See the significant statistics in this regard in Chapter eight. That

spent labouring, are clearly indispensible to mining, both miners and mineworkers routinely complaining that their essential experience goes unrecognised. Consequently, a significant aspect of skill in mining consists of informally learned and *tacit* skills (Leger 1992). These tacit skills employed in mining are, moreover, a direct function of labour time spent underground at the rock face. Regarding the tacit skill of 'reading' the signs of precursors to rock falls, the large bulk of underground workers, from 'unskilled' black gang members through to the more formally 'skilled' supervisory officials, learned this from seasoned, temporally socialised, black workers. This was due to '…mostly the team leaders and the black people who constantly work underground', 'because they have experience of many years' (Webster & Leger 1992:62).

The entire struggle of the white working class on the South African gold mines can be seen as one in which white miners, from as early as 1895, sold the formal, socially constructed, yet nevertheless differential value of their skilled labour power,[212] leaving them with 'only one of [their] former professional functions', which was 'to locate the position and direction of each hole in a face, so as to secure, when properly fired, the greatest effect with the least expenditure of dynamite' (Katz 1999:77-78). But it was not only these miners who could perform these tasks. They faced what they considered to be 'unfair competition' from a group of 'relatively skilled Africans, coloureds and Indians who were either fully or semi-proletarianised and who were *not* short-term workers' (Katz 1999:74) (my emphasis). As noted above and in Chapter four, some of these 'long service Africans'

hugely well-received training programmes often do not have the desired effect is another matter). I must mention a mentor, the late Joe Astle, in this regard. A taciturn man, his stern demeanour served only to mask a big, committed heart. Joe ran practical team building courses on the mine for production workers, jam-packed with fascinating techniques in which many local mines excel. He had been a shift boss. His hardest task was to get his own erstwhile colleagues involved with the training programmes he was putting 'their' men through. He thoroughly enjoyed his worker students. When I asked him once whether he had a good gang to train, he simply replied: 'They are all good gangs'. He was working his way through - 'rolling-out' in current popular parlance - the whole mine of 4 500 men at the time, roughly 25-40 men per five-day session. See Phakathi (2001) for an excellent description of the training programme.

[212] O'Donovan usefully tracks this process in some detail, specifically in relation to changes in technology at the rock face and related developments (1985).

- and ‘smaller contingents of coloureds and Indians’ - renewed their contracts and served ‘continuous periods which varied from five to eleven years’ (Katz 1999:74).

Labour time expenditure underground was, hence, directly responsible for the emergence of this social grouping and can be read as a causal factor in their legally institutionalised debarment from skilled work at the behest of organised white labour. Over time, the skill of supervisors and ‘promotion’ to an office job on surface came to rest on their overall organisational, cognitively-based skills and general knowledge of mining. All of their previous formally conceptualised skills, including that of how to place shot holes, were bargained off in exchange for increasing the value of their labour power, chiefly by increased bonuses and additional leave privilege or time off from work. Such skills are not, however, all there is to mining. The differential value of the white supervisory echelon’s ‘skilled’ labour on the South African mines nevertheless turned around the degradation of their labour via their ‘deskilling’, as Wright’s schema contends.

There is a tension here as to whether this analysis regarding the differential value of skilled labour power and the struggle to ‘dilute’ the supervisors’ ‘skills’ presents a full explanation in the racialised context of South African mining and beyond. From virtually the start of South African gold mining, broadly skilled craft miners were unable to exercise the full range of their hard-rock mining skills, particularly after the introduction of the mechanised pneumatic rock drill in 1894 (see Katz 1999: 77ff). Formally skilled, largely Cornish hard-rock miners were increasingly deployed as supervisors over increasingly large gangs of ‘unskilled’ and ‘semi-skilled’, both African and Afrikaner, machine operators, and did not, it is alleged, have much to do.[213]

Regarding this job, however, Dunbar Moodie is not entirely correct that improved explosives and drilling ‘jumpers’ (steel drill bits) have ‘eliminated the necessity for mining

[213] Moodie described this situation over 30 years ago by saying: ‘…the typical White miner sits on his box in the haulage, his picanin (literally ‘small boy’ - referring to an adult male black worker) on guard, relaxing in the company of White fellow miners’ (1976:16). See also de Vletter (1981:94).

skills in the placing of shot holes' (Moodie with Ndatshe 1994:48), 'the miner's distinctive ability' (Katz 1999:78). O'Donovan describes the skill in this way:

> Initially the marking off of a face was a skilled task, the position of the hole, the direction in which it slanted, the depth of the hole etc. would determine how the rock would be blasted. The examination of sockets could, to the skilled eye, reveal if the hole was properly drilled (i.e. in that it was sufficiently off the normal to break the maximum amount of rock) if the correct amount of explosive was used when charging, and if the holes were sufficiently spaced for the rock type i.e. if the *burden* was correct (1985:40).

Positioning the burden (the pattern) to mark off shot holes, currently done with a can of red spray-paint in the stopes prior to drilling, has clearly been extensively rationalised and standardised over a century. In a modern stope, a rock drill operator can now drill around 120 shot holes to the depth of over a metre in a shift - as opposed to a single 24 inch hand-drilled hole for which Chinese workers were contracted (Kynoch 2003:8) or the later 36 inch hole required per shift (Richardson & van Helten 1982; Moodie with Ndatshe 1994). There remains skill in not just marking off the burden on uneven stopes based on the mine standard as stipulated by mining engineers'.[214] There is still skill required as to the angle and depth at which the hole must be drilled to obtain an effective blast. If you sit in the same position to drill three or four holes, for instance, the angle of the shot hole veers off the 80-90 degree standard angle to the rock face and can result in a blast that damages the hanging (roof). It can further result in a jagged face, preventing the mechanical scrapers from being able to clean efficiently, as well then later having to make adjustments to the standard pattern for marking off the burden. Broken rock, further, needs to be shovelled in preparation for the next shift, a job rock drill operators (as Chapter nine will show) resist performing. All of this is what is referred to as part of 'drilling discipline' and is central to the rock drill operators' job. Both these and related matters are to be discussed in Chapter

[214] I witnessed a Section Manager embarrass himself in trying to make a point in front of a miner and a whole gang of African workers by spraying a difficult leading edge of a stope face so full of red spots and marks that no rock drill operator would have been able to say where he was to place his drill bit on the rock face. He was met with implacable stares and not a single word of comment.

nine. The non-standard execution of this work clearly also contributes to additional *indirect* surplus value creating labour, which, while productive, strictly speaking represents an unnecessary additional workload and must be interpreted as unperformed surplus labour (see below).

This issue aside, over a century ago, the 'deskilled' miner was a 'skilled-worker-overseer' (Legassick 1974c:15). Relying on the work of Katz (1976), O'Donovan contends: 'The decades after the 1940s sees a gradual deskilling of the mineworker' (1985:45). The question arises why and how this echelon of the working class has survived, for survived it has, albeit in attenuated form with no guarantee of a future for its next generation, as white artisans and supervisors on the mines point out all too often. Many of these men have recognised this and utilised the resources they have accumulated, due to the differential value of their labour power, to propel their progeny into a different social class.[215] An aim and real achievement is to send a son to university to become an engineer, thereby ensuring his future; often returning to the mining industry to boot. This elicits admiration and enhanced social status and is a source of great satisfaction and pride. While no direct evidence is presented in this thesis, this assertion is testable and worthy of investigation.

The answer as to white workers' survival lies not just in the ambiguous success of their racialised struggles. The skills miners and supervisors originally possessed still relate to 'a general knowledge of the mines' (Legassick 1974:15). White artisanal and supervisory workers' trade union-based organisational defence of the historical and moral component continues to play its role. Conceptually, this component must not be left behind when attempting to understand the persistence of the practical, organisational and cognitive skill of this supervisory echelon, analytical distinctions notwithstanding. There is no space here to entertain the old debate in Marxist scholarship regarding productive and unproductive labour. The extent to which such supervisors on the mines are members of the working

[215] In the 1960s COMRO research found this to be an aspiration of *black* mineworkers: 'The majority (of a relatively small research sample) also wished their children (somewhat unrealistically) to acquire secondary education or to obtain professional qualifications' (Glass 1964, cited in Jensen 1969:67).

class or ‘agents of capital’ or hold a ‘contradictory class location’, *a la* Wright (1978), can detain us but for a moment.

As Elaine Katz pointed out, the central skill of the miner was expressed over a century ago and has not changed: ‘Our duty is to read rocks and split them’ (1999: 78). Appendix II illustrates how the miner dubbed ‘Flaming’, much to the chagrin of his gang, ‘read the rocks’ more accurately than they did and thereby saved them from certain injury, if not death.

By way of further unquantified, but testable evidence, emanating from observation on a range of gold and platinum mines, the ability to ‘read the rocks’ remains a key skill, though only one of a range of tacit, experiential and heavily labour time-laden skills that miners and supervisors possess. This skill is best explained in relation to what Leger’s highly instructive work on the tacit skills of black mineworkers omits (1992). From direct observation on both gold and platinum mines, there are currently a relatively smaller number of production shift overseers (previously ‘shift bosses’) found in production stoping[216] than might have been expected since the de-racialisation of the ‘scheduled person’ (a miner holding a blasting certificate) in December 1988. This applies even more strongly to black Mine Overseers (previously called ‘Mine Captains’). This was the date when the first four black miners were issued with their ‘blasting certificates’, thereby cracking, but not breaking the hold of a politically privileged white minority located in key supervisory and organisational positions in the mining labour process underground. A year later, in the light of the legislative change from a racially defined ‘scheduled person’ to the non-racially defined ‘competent person’, it was proposed that the training of learner miners be significantly enhanced. Training was to deal with topics such as the knowledge of scientific concepts, cognitive training in conceptual skills and mechanical comprehension, coping skills, and a ‘value orientation’ programme ‘in which they are given an

[216] On the basis of observation from 1999 to 2004, black shift overseers (shift bosses) tend to be allocated to development ends and to supervise construction crews in the haulages responsible for meshing, sidewall roof-bolting and ‘guniting’ (spraying a protective screed of concrete on haulage side-walls to secure friable rock formations).

appreciation of the capitalist system and of how an industrial operation is conducted within this system' (Fone & Veldsman 1989:7).

The nature of much of the discursively transmitted knowledge and skill required for these jobs, however, remains largely embedded and protected in the still mainly Afrikaans-speaking mining community. If you do not have access to and participate in the talk around the bar - on Saturdays especially, when black miners are left without any supervision in their underground sections, still labouring under the regime of the clock - or do not have access to the *braai* in and around the white mining towns, you simply do not learn the more complex ropes of this occupation, unless, of course *time*, measured in years, is spent working underground. These men occupy a distinctive role in translating and operationalising geological mining plans. Their discourse is technical and arcane,[217] and closely tied to the knowledge of which miner does what and where, and how underground mining sections have been tunnelled and stoped in relation to their practically-based interpretations of the mining engineers' plan based on the surveyors' charts.[218] Beyond mining, the 'bureaucratic and administrative apparatuses' that Burawoy (1985:235) alludes to, specifically managerial training processes, designed for the new generation of 'junior'[219] black officials to perform these functions, are simply no substitute for inclusion within the relevant knowledge community dominated by an Afrikaner working class which is neither a 'myth' as Wolpe argued, nor who are a 'new petty-bourgeois' as Davies (1979) contended.

[217] I was in the offices of a shaft after an accident, which resulted in fatalities, when a senior personnel manager was sympathising regarding the difficulty the mine manager was having explaining the circumstances to the concerned CEO of AngloGold, Bobby Godsell.

[218] See Appendix II for the miner 'Flaming's' complaint of having recognised when an impediment was about to be broached. He was overruled by the engineer, who predicted it still to be some way off, thereby effectively denying him and his gang their bonus, ever intimately tied to net surplus value producing labour time.

[219] For 'junior' - the official parlance - read shift and mine overseers (see Smith *et al* 2004).

Briefly extending this particular case, it was reported that the industry did not optimise its selection of the new black incumbents at junior supervisory level, selecting as new miners not the practically experienced team leaders, but rather those with a measure of formal education, 'die klerks, die koks en die kakkes',[220] instead of perhaps providing a 'temporary blasting certificate' to men with years of experiential skill, who knew and were *de facto* performing the job. Lack of sufficient formal education debarred many of the seasoned team leaders from assuming junior managerial positions as miners and shift overseers. On a development course in this regard, one mining house elected to select for further training only team leaders with 15 years' experience, while another selected men with 10 years' experience who possessed a Standard Eight level (now Grade 10) school leaving certificate. The vast experiential skill of these non-commissioned soldiers of the industry does not qualify them to advance to a higher occupational level and they are held back by a lack of formal education in order to establish the *de jure* differential value of their skilled labour power. By way of contrast, the still largely white supervisors have protected their broader knowledge of mining, not without the assistance of administrative and lower to middle managerial staff in the offices on the surface who are part of their racialised social enclave.

The chapter to follow will show how it is the staff association representatives of these supervisors who have recently, on platinum mines, joined forces with the mass-based black trade unions to tackle working time issues. Management is compelled to acknowledge their crucial productive role in keeping the mines going, for they are not readily replaced and jealously guard entrance to their ranks. This attracts charges of racism from the mass-based trade union organisers unable to break into these ranks and secure jobs on the surface for leading and experienced worker members. If all mineworkers and miners 'read the (talking) rocks' - are able to assess precursors to rockfalls - as Leger (1992) so wonderfully showed, the largely still racially definable white and predominantly Afrikaner supervisors 'read the mine' - are able to assess general conditions underground more widely - a very different kettle of practical epistemic fish. It is this skill in particular that currently lies at

[220] The clerks, the cooks and the (useless) 'shits'. Interview, Section Manager, Arthur Taylor Colliery, 12 March 2008.

the basis of the differential value of their skilled labour power - and makes them indispensible (and management wary of them) in the mining industry today.

At another level, where black workers do manage to claw their way up the skills ladder, Wright's construal needs to be supplemented, in the South African mining context, with the notion of *racially* differential skilled labour power. Men on the *same* Paterson (see Perold 1985; le Roux 1985) grading scale tease and banter with one another across the racial divide as to their differential salary and benefit packages.[221] This phenomenon has been identified beyond the context of mining and been dubbed an 'informal wage colour bar' (Bezuidenhout 2005:82). That black workers with skill are subject to a racially socialised and structured institution, as in others beyond mining, is without doubt. To construe the phenomenon in terms of a colour bar is, however, merely to describe and not explain the phenomenon, let alone explain it in terms of capital accumulation rooted in value creation in production measured by labour time. Conceptually, the notion of a *racially* differential value of skilled labour power has the merit of locating a deeply institutionalised racist practice, born of struggles under specific historical and material conditions and played out over access to and the control over jobs in value-formation in production. Unpaid, surplus-producing labour time contributes to entrenching a racialised form of capital accumulation by reducing the value of skilled black African labour power via lowering the socially necessary component of the job at hand. Wright's category is consequently modified in the context of South African mining, revealing both the original conditions for and the perpetuation of continued racialised social practices in production. The continuation of these conditions, however, can only be understood historically and consequently relates to struggles over differential access to available resources (different pay for the same job in this instance) which defines standards of living. This example hence implicates the historical and moral (or social) component of the value of labour time and struggles over standards of living, hence blurring the distinction between the *racially differential value of skilled labour power* and the *historical and moral (social)*

[221] Focus Group with a non-racial group of shift overseers, Elandsrand Gold Mine, 1999.

component.[222] No matter how skill is construed, however, particularly when practised over time, skill clearly matters and issues in differential material social effects.

Further, given that the exceptionally low value of physiological minimum necessary labour could only be initiated under colonial conditions, these racially defined values of labour power stand in stark contrast to one another. The contemporary struggle of skilled black supervisor-workers is to attain similar standards of living to their white counterparts on the same skill level. The value of labour power, however, remains racialised due to the different trajectories of struggle that set the historical and moral component at a level established practically by social traditions. (It should be noted that wage differentials often co-incided with ethnicity - Sotho workers were traditionally preferred when shaft sinking was required and Shangaan (Mozambican) workers, over a significant period, dominated the occupation of rock drill operator. Both ethnic groups would have earned higher wages than other groups of workers on the mines.)

Capital, it could be said, relies on social traditions to extract further surplus from skilled black workers ensuring the *racially* differential value of their labour power on the same skill level as whites, pushing down the value of black skilled labour power in the interests of increased surplus value extraction - by virtue of altering the relation between necessary and surplus value differently in the two cases. By the same token, the value of white skilled labour power is and will be further reduced by attrition as the same skill can be acquired at a lower wage, the basis of white workers' struggles over the historical and moral component of the value of their labour power gradually being dissolved in the process. The value of any particular skill so reduced will constitute the basis of the value of such skilled labour power in the future. This has implications for trade union struggles and the social standards of living of the working class in general, and is applicable far more broadly than the area of mining that is the focus of this thesis.

[222] I am indebted to James Pendlebury for this insight, exemplifying my assertion noted above in qualifying my use of Wright's schema that analytical distinctions are not always readily distinguished in the light of empirical examination and require rethinking once applied in the dynamic flux of that aspect of life they were intended to illuminate.

The merit of this analysis, I maintain, is that it redirects the focus away from race and back to class. Once a class-based, value-theoretic analysis, such as has been offered here, is appreciated and articulated across the bargaining table, however, the sheer racism of this current practice (differential wages in the same wage band) within the industry becomes clearly evident. The illegality of such practices regarding the racialised 'securing and obscuring' of the accumulation of surplus value, as Michael Burawoy taught us, can consequently be revealed (see Burawoy 1985). But for that a genuinely de-racialised labour movement, armed with an appropriate production-centred account of exploitation and value creation, is necessary.

6.5.4 Redistributed surplus value

Regarding capital accumulation on South African mines, Ernest Mandel made the point that what has long been termed 'working costs' within the industry masks Marx's distinction between variable capital and costs of production. Mandel suggests that 'working costs' 'undoubtedly conceals a portion of surplus-value in the form of high salaries of the white overseers and directors' (1975:422). Increasingly generous periods of time-off by way of relatively long periods of paid leave, as indicated in Chapter four, constitute part of this component. In addition, emoluments and bonuses are awarded to the most senior position underground, the mine overseer, as well as - more importantly - other non-labouring and hence, in Marx's sense, clearly non-productive administrative and managerial categories of personnel based on surface. Very often, older men who had done their time underground, play an important practical epistemic role in the offices on surface. Their position, more clearly than supervisors still working underground, is less ambiguous in terms of their class position due to or because of their spatial distance from production underground in performing their administrative functions. Such jobs on surface are widely seen in mining communities, however, as the fruit of long, hard years spent underground.
The range of additional benefits and forms of remuneration available to this 'promoted' social layer in the working class and straight forward managers, further masks and potentially precludes accurate quantification of the transformation of the value of labour into profits (not attempted here) for these portions of redistributed surplus value. This

component does, however, find clear expression in the words of a colliery manager, whose comment could quite as easily have issued from the gold or platinum mines. Having come up through the ranks and referring to his own racially advantaged white working class community in relation to the mass of black working class labourers, he said: 'We made a lot of money from these people.' The importance of protecting privilege in this context, implicating the nature of social relations in and of production and going to the heart of institutionally despotic forms of control and continued forms of a racially based disparity in wages for the same work, is self-evident.

A comment on a note Wright (1981:68, footnote 26) makes is appropriate here before continuing with his schema. 'Many Marxists,' Wright says, 'would deny the existence of this component' amounting to an 'income privilege' embodied in the wage. This matter, on the face of it, seems a useful component insofar as it accounts for the 'political privilege' of whites in the racially divided South African mining context. Regarding the demands over reduced hours made by the trade union organisations representing this echelon of supervisors and underground managers, part of this redistributed surplus would be constituted by not just unequal rates of pay for the same level of work, but longer periods of leave routinely negotiated *in lieu* of the shorter hours demanded. I consequently accept Wright's view.

My grounds for accepting this redistributed component of surplus value is that this 'income privilege' appears to refer especially to 'managers and executives', in other words unproductive labour strictly speaking. The parallel with contractors in late 19th century America who 'were receiving a part of the surplus value produced by workers under their direction' and whose 'job-work earnings can only be understood as surplus value; they are far too high to represent the value of contractors' labour power', supports this contention (Clawson 1980:102). That working class supervisory groupings in South Africa have, on the basis of legally entrenched racial grounds in the past, benefited from this additional income - with implications for how surplus is distributed overall - is not in doubt. Bonuses paid to miners, and to shift and mine overseers, often relating to staying within budgets for their respective sections, remain part and parcel of supervisors' wage or salary packages.

Workers, it has recently been shown, have complained bitterly over their productive efforts having ended up as part of the miners' wage packet (Phakathi 2009).

This redistribution of surplus is not, however, confined to a racial redistribution. A group of white shift overseers likewise complained to me that their white mine overseer did not give them access to their own budgets, which the mine was decentralising down to their level in order to control costs better. The shift overseers firmly believed that their mine overseer was chasing a substantial end-of-year bonus for having remained within the budgetary constraints of his mining section underground. In this case, it is clear that the effect of the mine overseer's actions was to insulate himself against the group of shift overseers directly beneath him in the organisational hierarchy by holding on administratively to what was previously the sole preserve of the most senior underground official, the mine overseer, and therefore to the redistributed value of his labour power.

More than this, where such wage packets of underground supervisory men become larger than the administrative personnel on surface further up the bureaucratic hierarchy and hence the social status system of the mine, they have been known to have summarily been cut. Simply put, white underground workers cannot earn more - as they routinely did in the past - than white administrative managers who work on surface. Surplus value is consequently then further 'redistributed' from productive underground working personnel to 'unproductive' mine personnel based in the offices on surface.

6.5.5 Net surplus labour time

> *…aggravated problems of finance, rock temperatures, rock pressures, water and ever lengthening lines of communication … materially affect the transport of men and material as well as the transmission of power. Coupled with this is the steady whittling down of* ***that vital portion of the shift spent on actual production…***
> RN (Dick) Lambert, Assistant Manager at Western Deep Levels, 1957 (Cited in Oxley 1989: 88) (my emphasis)

The component of net surplus value is 'that vital portion of the shift' of which Wright notes: '…the critical objective of the capitalist class' is to 'expand this component' by

reducing ‘the other components’ (1981:68). Workers, given the right conditions and especially when it is in their particular interests, ironically struggle, as will be seen - as does the capitalist - to maximise net surplus value by attempting to maximise the time they productively spend *directly* on net surplus production. Even without the right conditions, workers do this, for otherwise they do not earn their bonuses, an important part of the wage positively linked to actual *direct* working time. Mineworkers do not generally hold back on production or hold others back to ensure the maintenance of a ‘rate for the job,’ thereby ensuring the continuation of the ‘game’ whereby the securing of surplus value is obscured *a la* Burawoy (1979). Mineworkers rather, as a general rule, work purposively and often strain to get the job done, as the two following chapters will show. Their complaints will centre on low wage rates, in other words essentially bemoaning the poor value of their labour power.

In Wright’s schema, this component of the working day - actual hours of work directly performing work in production - signifies net surplus value, but does not correspond to any particular form of struggle. This is not a satisfactory aspect of his schema. Workers can be performing work tasks more or less intensively, which results *directly* in net surplus value, but be simultaneously engaged in a go-slow *or* consciously be working harder. This could be for any number of reasons, from being engaged in a struggle for physical survival and better wages by embarking on a go-slow, through to exerting themselves and working more intensively to win targets in a planned manner to win reduced working hours, as the next two chapters will show. The number of hours *actually* spent directly on production does not, consequently, mean that such hours producing net surplus value are necessarily devoid of contestation.

Further, the *actual* number of hours of worked is made up of both *direct* and *indirect* surplus producing labour time. As Appendix II illustrates, much work also constitutes *indirect* surplus labour and which is often the result of difficult geology or managerial inefficiencies. I hence distinguish between *direct* surplus labour for labour-power actually expending itself over time producing net surplus value, and reserve the term *indirect* surplus labour for any necessary work performed during regular, timed working hours

establishing conditions for direct working time. Both of these forms of applied labour power create value. Wright's component of *actual* hours of work performed thus includes both *direct* and *indirect* value- producing work. 'The value of the product is determined by the hours working *directly* and *indirectly* absorbed in its production' (Catephores 1989:61) (my emphasis).

Given the gaping porosity of the working day in mining, many *actual* hours can be spent fighting the rock and getting nowhere (as related in Appendices I and II) and yet be establishing the conditions for net surplus value creating labour time.

A number of the 'internal' institutional factors, found to have been critical issues over the course of the past decade in the research for this thesis and quantified in the next chapter in the case of platinum mining, have recently been confirmed as bedevilling value creation in gold mining (Phakathi 2009). The factors Phakathi documents under contemporary mining conditions occurred on the Zambian copper mines 40 years ago (Burawoy 1985:237). Tensions and struggles within production relations often turn around conflicting interpretations regarding the causality of events and incidents flowing out of such conditions and which incidents may have been avoided or not. These factors, both 'internal' and 'external', conditioning mining production, all play their part in requiring long working hours, thereby altering the magnitude of value extracted from any specific shift underground, a specific mine shaft or corporate mining group, and more generally the value extracted from aggregate social labour. Theoretically speaking, *value* is not merely an abstract general concept applicable at a 'higher level of abstraction'. Value is, rather, relational and concrete. It '*exists'* as a social relation (see Fine 2001) (my emphasis).

These factors, both germane to production itself and more broadly, separately and most especially when combined, all impact on whether a crucial part of workers' wages, such as bonuses, is earned or not. Production bonuses have long been a part of mine wages. For Leger, the bonus remains the hidden form of supervisory control, which, in this case, would secure workers' co-operation, but not necessarily their loyalty (1985:2). If Burawoy is correct that '… the autonomous self-regulating group controlled by the wages system is

still the most effective form of work organisation' (1979:207), mining in South Africa is a case in point and has recently received detailed attention (Phakathi 2011). Tensions, conflicts and social struggles in production are inextricably integrated and woven into these conditioning factors, which, treated in particular ways, deny workers their bonuses. In brief, often the expenditure of *actual* labour time is insufficient to win a bonus: actual production targets - which both 'external' and 'internal' factors often inhibit - must be met. Too great a proportion of the actual hours spent working is spent *indirectly* on preparing or *improvising* (*planisa*) to create the conditions to work directly on the job at hand. In other words, *actual direct net surplus labour time* must be sustained for an appreciable duration over the working days in a month in order to win a bonus. For a rock drill operator at the face, working consistently as one did (as I sat through it all), this consumed five hours of a shift of around eight hours.

The failure of managerial systems and procedures consumes time unnecessarily underground and is often the cause of the manufacture of *dissent* (see Phakathi 2011). Briefly, one issue here is the extent to which workers not only *consent*, as Burawoy (1979) has long held, to their own exploitation, but *actively* and *positively* desire more rational systems:[223] they *planisa* (Phakathi 2011) and employ strategies that save and do not waste time in the interests, often, of their own safety and survival underground. In addition, workers argue that improving systems, ensuring the provision of the right materials and equipment at the right place at the right time would enable the shortening of working hours.

[223] The issue is not so much Burawoy's question of 'Why do workers work as hard as they do?', arguing for workers' consensual quiescence in the process and relegation to 'playing games' in production (noticeably absent in deep level mining at the face); rather, it is that workers are compelled to do so in the face of managerial irrationality and the systemic wasting of time in order to snatch moments of reprieve from work underground to preserve their own physical strength. This is a worker critique of management and their 'ignorance' as to 'what really happens down here' - confirmed by a leading Chamber of Mines head-office official to the candidate personally: "Some of us were shocked at your research Paul. No! *All* of us were shocked!" This was said about the Deepmine Research project (Webster *et al* 1999) (my emphasis).

Whereas the focus on this net surplus value-producing, direct labour time (*actual production* at the face in Dick Lambert's terms) is the general focus of managers in all profit-seeking concerns, at times this component comes explicitly into focus, as noted in Chapter four regarding the van Eck Commission on Conditions of Employment in the Gold Mining Industry (UG 28 of 1950). With all other factors remaining the same and with the prospect of reduced hours for white workers, this would have reduced 'face time' - *direct* labour time spent at the rock face. The industry was compelled in the interests of net surplus value to defend the length of the working day. As previously noted, the van Eck Commission consequently did not result in a reduction of working hours. African workers, it has been shown, were allegedly working anything from '12 to 13 hours on some mines' a few years before (Allen 1991:462).

In this instance, the struggle of organised white labour to reduce the length of the working week was denied on the grounds of the effect on the net surplus value-producing labour time of African workers. In terms of Wright's schema, the industry was concerned *not* to increase unperformed surplus labour of African workers by virtue of the absence of white supervisors in production. The industry was again defending the length of the working day by defending the racialised organisation of the labour process, or perhaps, more cynically, using the legally racialised construction of the labour process to deny organised labour reduced working hours. Whatever perspective is adopted it amounts to the same thing: productive time at the face in the labour process *determined* (purposively used here in its strong epistemic sense) mining capital's response to organised labour's demands.

In Appendix II the miner 'Flaming's' gang wanted to finish off an extended stint of *indirect* surplus labour time, precisely to get onto metres-per-month *direct*, bonus-winning net surplus value working time. The young mineworkers in Phakathi's study were not prepared to complete the support-drill-and-blast cycle (the broader net surplus value-producing cycle) as they experienced a long working day (of around 14 hours from door to door) having to travel to work from the townships surrounding the mine, as well as believing the miners, under whom they worked, stole their bonuses and so cheated them out of the critically *valuable* portion of the working day (2009). Their 'unorganised'

protest or informal resistance of either being late or not pitching up for work is best explained, I maintain, in terms of a struggle over working time, or, more precisely, over the value of their labour time. For a female mineworker the reasons were clearly thoroughly social ones: after only getting back home after having left 15 or 16 hours earlier, she said: '...it's hard to be a mother, a wife and a mineworker at the same time' (Benya 2009:90).

The trilogy of workers' *production demands* - labour, materials and equipment - as will be seen in the next chapter and further quantified in the one following, related crucially to often frustratingly *wanting* to get on with the job of net surplus value production in order to win a five day working week or, more prosaically, simply to earn bonuses. The demand of the artisan and miners' union representatives for infrastructural changes to the workplace on a platinum mine in 2003 will also be seen as amounting to the same thing: a demand for greater efficiency so that their demands for either a bonus-bulked wage packet or increased leisure time could be met. Over net surplus value, in other words, contrary to Wright's model, there are struggles aplenty.

To be fair to Wright, these instances could all be interpreted as attempts to reduce unperformed surplus labour, as per his analytical model. This does not seem to me, however, adequately to account for the positive and willing collective attitude workers manifest when consciously struggling to intensify their labour in the interest of winning a bonus or additional disposable or leisure time, time off from work, in other words. Wright at this point appears to assume capital as the only agent in his schema: i.e. that it is only capital which seeks to reduce unperformed surplus labour, disallowing eventualities where workers themselves seek to gain greater control over production itself and push for the attainment of managerially imposed production targets, despite increasing their own rate of exploitation as Chapter nine will show.

That mineworkers work considerably more autonomously than in many other enterprises, often with a degree of pride, despite the factors compelling them to be there in the first place, has long been noted. Black mineworkers sometimes, as one of Moodie's informants

averred, ‘discuss boastfully their ability to perform a perfect job in their various tasks in the stopes. They are keen that every one of them should do a perfect job … else they all face the risk of falling rocks’ (1976:12). Or as a miner, assuring me that the drastic situation (as related in Appendix I) would come under control, the result, he said, would be ‘a beautiful panel’ (rock-face). Boasts of a job well done were legion in the then still predominantly white working class bars on the West Rand around the mines a decade ago, and you can hear the same thing today. Underground, generally speaking, mineworkers get on with the job. A generation ago it was said that ‘workers seem to know what they are about’ in the informal moral economy of mining (Moodie 1976:12). My own experience underground certainly fits in neatly with the statement of Moodie’s informant of over thirty years before.

6.5.6 Unperformed surplus labour

The struggle over control of the labour process revolves around unperformed surplus labour and the actual length of the time spent working during the working day. Wright, it was shown, has made this clear by referring to how the work of a number of writers can be read as revealing this aspect of labour time expenditure. As Wright puts it:

> Generally speaking, workers will not actually perform as much labour on the job as the number of hours they are employed: there is ‘wasted’ time or unperformed surplus labour and which occurs ‘through a wide variety of mechanisms’ (Wright 1981:68).

The natural porosity of the working day in the mining labour process provides much scope for the occurrence of this crucial analytical category, which both managers and workers, for different reasons and in different ways, try to eliminate, for it erodes profits and ‘steals’ leisure time. Wasted time underground has long been a bone of contention in mining, more broadly than the ‘complaints about delays in hoisting blacks from underground [which] are as old as deep-level mines themselves’ (Moodie with Ndatshe 1994:284). For Moodie, such delays, particularly when they become unusually long for no apparent reason, are a causal factor in incidents of racially inspired violence. My concern is how such time-wasting and other delays impacts on the value of labour power. If what Wright refers to

here is, for instance, the series of dysfunctions directly attributable to managerial inefficiency and inadequate systems regulating the production process, then much statistical and oral evidence for this component is to be cited in forthcoming chapters. Hours spent hoisting, travelling and waiting are unavoidable, but can be and have been reduced through improved technologies and work-flow processes. Managing labour shortages is a constant issue confronting managers, let alone dealing with them underground. Systemic dysfunctions can be and are 'engineered out', generally not without difficulty. The time consumed in all these instances constitutes periods of unperformed surplus value, which erodes both *direct* and *indirect* labour time (i.e. Wright's *actual* hours of work performed), directly affecting net surplus value.

In many instances, the improvising role workers and organising supervisors assume in the labour process, dubbed *planisa or* 'making a plan', exemplifies unperformed surplus labour (see Phakathi 2001, 2011). For instance, on one occasion I personally walked for three hours through the haulages with a team leader in search of a piece of ventilation pipe, prior to an official visit of the 'bosses' to a very far-flung development-end, in order to ensure the miner's workplace was 'up to standard', but to no avail. This was wasted, unperformed surplus labour time.

Workers in the development end (see Appendix II) *wanted* to get on with the job, precisely in order to get on to direct net surplus value bonus creating labour time, but were prevented by Flaming the miner on safety grounds; he was proven correct by the continued fall of rock from the hanging, which would certainly have injured, if not killed, those workers. The struggle was over decision-making authority - literal control over the labour process, in other words - and the workers fortunately lost that particular round.

The round Flaming, the miner in the development-end, lost was the struggle to convert indirect surplus labour time into direct net surplus value bonus-creating work. Flaming's experiential knowledge, won over time, had enabled him to report, upon seeing signs such as black water and the drill-steel getting stuck in the rock face that the closed haulage was close by. He was overruled by the engineer, who had calculated that the impediment was

further ahead. Had the miner's 'reading', which proved correct, been accepted, the target face advance, the measure of actual work and net surplus value, would have been adjusted lower to account for the delay. Workers could have feasibly attained their target and won their bonus. Because workers did not have control over the labour process, because they were overruled, 'the mine' benefited from subsequent face advances made, without having to pay for them at bonus rates, effectively increasing the ratio of unpaid (surplus) to paid (necessary) labour for net surplus value-producing labour time. This affected the mood and morale of the development team, who had lost all prospect of earning a bonus that month.

The work on the tunnels is necessary work, indirectly establishing the conditions for net surplus value extraction. This indirect labour also attracts a bonus when a target (a specified face advance in a development tunnel) is met. When workers work with a particular degree of intensity, it is assumed that they can win a bonus and *vice versa*. When workers nevertheless work at the required degree of intensity, but do not have control over the labour process, they can, if their attempts at improvisation (*planisa*) are unsuccessful, forfeit their potential bonus.

Wages are known beforehand and hence calculable as one of the costs, which, when calculated alongside all other costs (which in mining are high) are but a portion of the sale price of the product. Managers' plans and the monitoring of them will consequently be concerned with ensuring that the time spent in any aspect of production will not be more than the amount of wages budgeted for particular work activities; in other words, the costs of the reproduction of labour must not be exceeded at any point. For if this is the case, then the component of indirect surplus labour (essentially necessary preparatory work) no longer attracts value. The bonus is designed to ensure this does not happen.

For Flaming and his men, the stalling of the face advance raised two issues: their normal working day was lengthened by struggling with the rock face, plus they had forfeited their monthly bonus. The slow rate of work in the development-end drew the attention of managers and got them down to the far-flung tunnel as the desired progress as specified in the mine plan was not being achieved. Had the workers successfully met their target face

advance they would have exceeded the necessary labour portion of the working day; they would be producing a surplus over and above the cost of their wage; they would have been assured of their bonus; and capital would, by noting their bonus-attracting capacity, be assured of their productivity and its own profitability. In accordance with Wright's schema, then, the struggle of Flaming and his men is a matter of a struggle over the labour process, of whether the actual hours expended in production were producing a surplus in terms of the costs of production, and hence whether or not they were producing surplus value.

6.5.7 Historically unavailable surplus labour

> *The establishment of a normal working day is the result of centuries of struggle between capitalist and labourer.*
> (Marx 1977: 257)

The historical record traced in the two previous chapters showed that in the early years of mining, and for a good time thereafter in the case of black mineworkers, a working day very close to its maximum physiological length, characterised ultra-deep gold mining in South Africa. The African Mineworkers Union (AMWU) in the 1940s certainly advanced the view that miners worked the maximum possible number of hours. Currently, for many of the generally younger mineworkers, whether male or female, where travelling to the mine and back is included in how the working day is measured, AMWU's point still applies, with between 14 and 16 hours consumed in the process. For, with the dissolution of aspects of the hostel compound system, travelling to and from the mine has become an issue.

A platinum mine specifies that women must live within a 60km radius of the mine to qualify for being employed there (Benya 2009:88). *Direct* net surplus-producing labour time remains relatively brief in many instances, hence the necessity for maintaining a regime of long working hours. A female worker interviewed recently worked eight hours 50 minutes on a 'good' day, while on a 'bad' one she spent nine hours 50 minutes underground (Benya 2009:88). This is a working week of anything between 52 and 57

hours, assuming the shift on Saturday is a regular eight hours. When the length of the working day is reduced, this adds to historically unavailable surplus labour time.

The struggle to reduce working time continues to manifest itself. It appears increasingly the case that the new, generally younger generation of educated and politically conscious miners are no longer prepared to work longer than normal shifts in order to complete the support, drill and blast cycle and achieve a regular blast necessary for winning a production bonus (Phakathi 2009). At the heart of what Phakathi terms an 'intra-team conflict', one of the factors resulting in the poor implementation of an incentive bonus scheme is a generational division (Phakathi 2009:30-43). A closer examination of his evidence, constituting primarily the accounts of workers, reveals that the issue of their unpaid labour time, which they firmly held went into their miner's bonus (or what Wright calls redistributed surplus value), lies at the centre of the generational gap between the young 'CAs' or '*amapantsulas*' and the long-serving and less educated sweated 'old timers' (see Phakathi 2009). The former justifiably 'stick to the time and the law', and were simply not prepared to work longer shifts in order to complete the productive work cycle when circumstances required additional labour time (Phakathi 2009: 31,37).

In the single instance when Phakathi himself accompanied one of his young informants to the township, where it appears most of them live, Phakathi left the mine around 5pm one afternoon. Not having stayed overnight in the hostel, being a mere 'stone's throw ' from the shaft, he had to rise 'at 3am to catch a taxi by 3.15am aiming to arrive at the mine at 4am for a 4.30am cage.'[224] 'Had I slept in the hostel, I would have slept longer and had breakfast before I went underground. I would have saved money, energy and time' (Phakathi 2009: 41). This constitutes a 14 hour day, door to door; small wonder that the

[224] A manager on a platinum mine in 2003 reported that the workers were getting up at 2.30am in the morning to get to work. They were asking why they needed to get up so early as the supervisor only arrives at 7am. There is no record in field notes of the occupation of the men who made this complaint. That black workers had to wait for the 'supervisor' before starting off with the day's routine still occurs in the 21st century!

new generation of miners, both male and female, are loath to work the crucial additional labour time wherein net surplus value is produced.

I found the same phenomenon on a platinum mine. Young educated workers were leaving the underground workplace to ensure they reached surface at exactly their allotted time. The mine had incline shafts so workers could literally drop their tools and walk out, a practice not possible on vertical shafts where one has to wait to be hoisted to surface.[225]

The NUM has latterly attempted to imbue a sense of responsibility and work time discipline in the new generation of miners by encouraging them to pitch up for work regularly (Phakathi 2009) and make their labour time available. This mirrors the unions' plea to mineworkers shortly after Zambian independence (Burawoy 1979). The struggle to attenuate significant degrees of absenteeism has pitched the NUM and the industry - at least on the mine where Phakathi conducted his research - against this new generation of primarily single, unattached young township men between the ages of 20 and 30. This is more than an implicit recognition of the importance of instilling a sense of time discipline in the emerging generation of mineworkers. But these men, on both gold and platinum mines, are voting with their feet around the length of time they work. Absence from work signals a collective degree of disenchantment with working conditions, expressed most clearly by not going to work in the first place or declining to work anything more than the strictly specified allotted number of hours. Winning their loyalty will clearly need to focus on the factors preventing the deployment of actual, bonus-attracting, net surplus value labour time. This constitutes a singular challenge in mining as the working day absorbs significant spells of unperformed surplus labour time. Any changes in the organisation of

[225] My notes put it as follows: 'The young educated mine workers are in one sense perfectly aligned with the new systems the company boasts. The men underground act accordingly. Job descriptions, human relations, environmental, occupational health and safety and a wide range of procedural systems are in place. The break with the past is clear. Where materials are not on site, where a hose breaks, when the power fails, when a winch rope snaps or anything occurs to prevent them from doing their job, they simply trudge out of the stopes into the fresh light of day, not a moment's worse for wear. The old tradition would have waited and slogged it out, seeing where they could lend a hand, ensuring they could get their job done and get a blast for the day and then only leave, despite generally not being paid any extra for the additional hours spent underground.'

work in the interests of safer and more profitable mining, however, do not so much lie in the attitudes of the new generation of miners, whose actions are perfectly within their legal rights and a new moral economy under democracy, but are the responsibility of those planning and administering the mining labour process. Where dysfunctions occur, lengthening an already long working day results in the problem of absenteeism representing additional historically unavailable labour time.

It is ironic that while the struggle in the future will almost inevitably increasingly turn around actual hours of net surplus-producing labour time, Wright's schema was shown to be silent in relation to forms of struggle thrown up by this component of the working day. As Chapter nine will show, where labour time is divided into time spent earning the regular wage and time spent earning a bonus, workers chase the latter component of the working day. Whereas in the past, wages were summarily cut in order to devalue labour power, currently it is the bonus that is manipulated to retain the scarce skill of the miners, i.e. those with experience born out of adherence to a temporal regime and discipline, in order to distribute it in favour of longer serving (and hence often more skilled) and less experienced miners.

That the cleaning night shift is populated largely by black miners is seen as and is racism, but would be justified in terms of seniority on the shaft, measured of course in the time the miner had spent working there. What Phakathi omits to do, however, although this issue is not his focus, is to provide an explanation for this phenomenon in terms of the social and political power, however attenuated, that these white workers continue to exercise on the mine, due to their collective and practical expertise in the mining labour process, and their access to administrative and logistical support from the offices on surface. They control access to the better-paying jobs on day-shift, quite apart from the fact that night shift remains an unpopular time to work.

Actual hours spent working on indirect net surplus value-producing labour time, simply put, can pay less than the opportunity to engage in bonus-attracting direct net surplus value-creating labour time. When unable to earn a bonus, or when relegated to work where

bonuses cannot be earned, workers simply absent themselves, resulting in greater tranches of historically unavailable surplus labour.

6.6 Conclusion

When the length of the working day is analysed in terms of Wright's scheme, a deeper explanatory reading of how value is created in production, resulting in a range of struggles, comes into focus. The logic of the process of value creation in production, via a disaggregated conception of labour time expenditure, becomes clearer once the labour process and the social relations such work presumes and entrenches, are seen in this light.

What this chapter has but introduced is the set of temporal indicators marking off the internal dynamics, and arguably the genesis within capitalist production relations, of a series of social effects. For when labour time is analysed in the context of its expenditure in the labour process, not only does the reason for long hours become clear, but the very temporal decomposition of the working day, viewed through a value-theoretic lens, is seen to shape both cooperation and contestation in production and structure broader social relations beyond it.

For the capitalist, necessary labour time is indirectly extended by paying workers at normal rates for actual hours of labour time spent sorting out unavoidable geologically induced delays. This cannot be helped. But having to improvise time-consumingly around avoidable systematic organisational dysfunctions or dealing with the consequences of labour shortages represents labour time which *could be spent on actual direct (net) surplus labour*. Workers must absorb delays and sacrifice the crucial part of their wage paid as a bonus, within which there is a greater proportion of value (both in terms of the creation of surplus value and in the value of the labour-power expended) than in normal time. For during socially necessary labour time, the labour of the average worker under normal conditions, paid at normal rates with current technologies, has already secured a certain proportion of necessary to surplus labour time. The capitalist, however, must continue to pay the worker, despite no direct production or target having been achieved as a result of actual (indirect) hours spent working. By being compelled to work at above-average rates

of intensity in order to secure a bonus, the worker is doubly exploited. Not being able to earn a bonus on which workers depend, through no fault of their own, significantly intensifies alienated waged labour. The creation of real wealth, as Postone (1993) argues, assumes the form of *value*, an alienated form of work thoroughly embedded in and constituted by the social relations in and of production.

The social and political relations and struggle of organised workers over limiting labour time expenditure end up focusing either directly back on production, as the value form of wealth creation is defended by capital or have the detrimental social effects of lengthening the labour time of the working class as a whole, which workers resist. Unsurprisingly, in the South African context, this assumed a racial hue, the value of the labour time of two racially separate echelons of workers being inextricably wound up with each other. This stands out in stark relief when the restructuring of labour time forces itself onto the social agenda due to trade unions responding to workers' demands for decent working hours. It is to such restructuring that this thesis now turns.

7 Restructuring labour time

> *I have worked shifts most of my life. You don't get used to it. You accept it*.
> 59-year-old platinum mineworker, 2003

7.1 Alternative working time arrangements: 1991 - 2005

By 1978, one aspect of changing working time arrangements had become clear: reducing working hours was inextricably bound up with the re-organisation of work (Chamber of Mines 1978). Research confirms this finding regarding the relation between labour time and work restructuring (Dal Rosso 2002). The alignment of the legal process would all too quickly follow suit. For the very next year the Wiehahn Commission would recommend that black workers be recognised as employees and be able to associate freely.

Three years before this event, the stage had been set for mining capital's shift from, broadly speaking, a unitarist/authoritarian approach to a more pluralist/liberal orientation to the treatment of the black working class. The mine owner of Anglo American, Mr Harry Oppenheimer, had publicly declared his interest in opening up the industrial relations sphere to black workers. The section of the speech on trade unions was apparently written by two politically progressive senior mine managers: Kallie van der Kolf and Bobby Godsell (Moodie 2009). This view essentially amounted to freeing up the racially constrained value of the labour-power of black workers by making more rational use of their labour time.

The NUM was formed shortly thereafter, began to organise on the mines and within a few years loudly expressed the voice of its constituency via the 1987 mineworkers' strike. The strike was essentially defeated (Moodie 2009). This was primarily due to massive retrenchments as the industry availed itself of the opportunity of a massive political power struggle, I suggest, to rationalise its manpower supply to make up for the temporal concessions resulting from organised white labour's long struggle over the five day working week.

With the young NUM seriously weakened, only a few years later would a Mining Summit, initiated at their behest, attempt to address the 1990/1 gold market crisis. The prospect of a true five day working week became a serious practical option for the first time. With the politically conservative fraction of the industry's managers largely defeated and the establishment of a modern industrial relations scenario on track, the industry sought to *extend* labour time overall by instituting continuous[226] mining shift schedules. For extending working time to its absolute temporal limit is more readily amenable to conventional business logic in the interests of maintaining profitability, than simultaneously to *increase* the relative productivity of labour time expenditure and *reduce* hours, as required in a five day week arrangement. The combined aim of mining capital and organised labour, nevertheless, was to collaborate to save jobs and ease or overcome yet another of the mining industry's innumerable profitability crises.

A committee, with Bobby Godsell present, was set up to provide guidelines for mines choosing to participate. Yet even as late as 1991, the point at which working time surfaced as a prominent social issue internationally, with trends signalling a break in the shape of the 'standard working week'[227] in industrialised countries (McCann 2004:10), there was no fully-fledged set of guidelines to follow. The International Labour Organisation (ILO) had yet to specify adequate design criteria for shift work in general, let alone in mining. While South Africa was a signatory to the ILO Safety and Health in Mines Convention 176, as of 2002 no formally accepted 'international standards for continuous mining' existed (Jennings 2002: 27).

A further decade later, as flexibility regarding working time came to dominate policy discussions in industrialised countries (McCann 2004:10), research internationally on

[226] Twenty-four hours a day, seven days a week, ideally over 365 days a year.

[227] The 'standard working week was initiated by the ILO in 1919, at their first Convention, but is 'disappearing in many occupations' (Berg *et al* 2004: 333). The term 'regular' is used to refer to such 'standard' working times. Working two Saturdays a month remains considerably more 'regular' and closer to this original 'standard' labour time regime than continuous working time schedules and variable, non-regular working hours.

shift work in mining was reported to be 'very rare' (Heiler 2000:2). With the influence of the Chamber of Mines in South Africa waning after more than a century of virtually unchallenged centralised hegemonic dominance, individual mining houses and companies would be forced to muddle on by conducting a series of working time arrangement 'experiments'. This decentralised, 'fragmented and diversified' experimental scenario followed global trends (Jennings 2002: 28).

Since the Franzsen Commission, the 'large majority' of gold mines continued to work the traditional ESF, even where some experimentation with continuous shift schedules was introduced for various, generally limited proportions of the workforce (Lewis and Wegner 2000: 17). Continuous work arrangements (Full Calendar Operations - Fulco), however, certainly did not take off as 'initially expected' in the early 1990s (Lewis and Wegner 2000: 2).

Where either continuous work or five day work week experiments were attempted, restructuring working time arrangements were found to implicate a plethora of both strictly production and social issues.[228] The design of shift systems and the Safety in Mines Research Advisory Committee (SIMRAC) research finding, *inter alia*, that there are no 'good' shift systems, but that 'bad' ones can readily be identified, did not take long to come into focus (Kielblock 1995). With the health and safety of workers emerging as paramount, not least due to the focus of the NUM on the issue of health and safety (see Leger 1985), labour time expenditure revealed its eminently *social* character.

Where the main driving force for changes to working time regimes, namely workers' demands, is counterposed by capital's preference for continuous operations, factors *beyond* production, i.e. *social considerations*, largely predominate. In the few cases where individual mines were prepared to reduce working hours, generally by way of moving to a five day work week in order to maintain established, regular and socially acceptable

[228] For instance, 35 municipalities, 'likely to be affected by the introduction of a shorter working week in the mining industry' were invited to appear before the Franzsen Commission (1977:103).

labour time regimes, factors *within* production, i.e. the *technical and organisational considerations* of the labour process proper, assume predominance.[229]

While the majority of mine workers are shift workers,[230] the predominant pattern of working time arrangements remains one that shares regular hours with the rest of society. When considering continuous production operations, labour time, however, splits into the two differential time-structurings of the 'man-week' and the 'mine-week', as noted by the industry in its submission to the Franzsen Commission in 1977/8.

The 'man-week' is the length of the working time of the individual worker, as defined under a multiplicity of social and historical conditions, as Chapter four began to outline. The 'mine-week' is the duration of the production process, which, from the point of view of labour time, represents the maximum limit to which absolute surplus value can be extended, not by virtue of extending the working day of the individual worker to its maximum physiological length, but rather by employing the full cycle of time applied to the labour force overall, thereby attempting to eliminate historically unavailable surplus labour time. Someone is always at work, throughout the day and night, irrespective of the working hours of individual workers. Trade unions, with the NUM being no exception, buy into this working time arrangement for two reasons. The working hours of the individual worker are ideally reduced to a 40 hour week and more workers are required, thereby increasing employment.

With the shift to continuous operations, more broadly, the material basis is laid for neo-classical economics effectively to dispense with the socially value-laden concept of labour

[229] The immediate reason for this is that the transport of mining personnel, materials and broken ore need to be scheduled, often to more than 3km underground, via a single mine shaft hoist of finite physical capacity, while travelling time to and from the rock face increases, extending unavailable surplus labour time virtually daily, exacerbating the necessity of long working hours in many instances.

[230] The afternoon and night shifts are primarily 'cleaning shifts' (to remove blasted ore from the rock faces by means of mechanised winches and scrapers) and are considerably smaller than day shift in terms of numbers of workers per shift.

time. How time is measured changes. The 'new' measure now quantifies, not the labour time of the individual worker, embedded in a stable industrial working time regime, but rather the overall duration of the production process. Despite this 'new' measure of the length of the production process, this does not increase value and surplus value which remains the product of 'the labour time, objectified and living, employed during this production phase' (Marx 1977:669). As noted, this 'new' measure of time has come to be used as abstract analytical tool in neo-classical economics (Mosselmans 2004). Labour and time are disassociated. The time-honoured rhythm between night as a time for sleep, and day as a time for work, dissolves. This has become particularly evident as the ideal of the absolute limit of linear time itself, 24 hours a day, seven days a week, 365 days a year, is potentially within reach. For Moishe Postone's post-Marxist re-categorisation, time becomes an *abstract* form of domination in advanced capitalist societies (1993), evoking Marx's early claim that 'time is everything; man is nothing; he is, at the most, time's carcase' (1978: 48).

Central to the socially constitutive and structuring capacity of time in its abstract form lies neo-classical economics' positivist and scientistic deployment of this 'new' hypostasised conception of time, divorced from the total social labour time of living labour. Postone's analysis, by contrast, identifies this 'new [dominant] form of [abstract] time' with 'the 'progress' of capitalism as 'a form of life' (1993:212-213). Postone thereby articulates the role of time, and of labour time in particular, as constituting a socially constructive and concrete material practice issuing in a range of social consequences and effects, the likes of which will be seen to result in a new round of social contestation and class struggle, the dialectical logic of which escapes Postone's attention.

The specification of labour time embodied in working time schedules, in hours, days and weeks, can be changed and restructured in two primary ways despite the 'almost infinite array' of possible working time arrangements (Jennings 2002:28) or the 'almost infinite … possible structurings of time, or temporalities' (Glucksman 2005:34). Labour time can be simply extended (absolutely) or the hours of existing working arrangements can be intensified (relatively) by reducing working hours.

From the point of view of workers and the length of the working day and week, the first option, the absolute extension of social labour time, represents a retrogressive social development, while the second - the relative intensification of labour time - represents a potentially progressive development. From the point of view of conceptual abstraction, as well as in terms of the actual development of historical progress of the productive forces, however, there is no such easy distinction to be made. For '…from one standpoint, any distinction between absolute and relative surplus value appears illusory' as the extension of labour time and increased extraction of absolute surplus value, Marx asserts, 'makes necessary' the 'relative' productiveness of labour (1977:478).

The sharp analytic distinction between absolute surplus value (based on lengthening the working day) and relative surplus value (generally construed as co-terminous with the introduction of machinery)[231] resulted in a widely held view that these two forms of value creation under capitalism follow one another in linear chronological fashion. In the historical development of advanced capitalist societies, to some extent this is true.[232] Yet it is only roughly accurate. For 'relative surplus value', Marx also argues, 'is absolute, since *it compels the absolute prolongation of the working day…*' (Marx 1977:478) (my emphasis). Not only this, but where a relative surplus value extraction regime, predicated on mechanisation, stalls at the heart of the mining labour process underground, the absolute surplus value regime must be extended overall. In addition, relative surplus value extraction is increased by intensifying work by non-mechanised means as well as the introduction of machinery throughout the development of the mining industry.

While this view of Marx's construal of the relation between absolute and relative surplus value has been noted (see Tomba 2007:28), it does not appear to have been explored empirically. In practice, a critic of Marxist value-theory correctly asserts that capitalists

[231] See Fine for a similar standard construal of the relation between absolute and relative surplus value (2001: 43).

[232] Dunbar Moodie goes as far as to say 'The logic of capitalism is fundamentally about the production of relative surplus value' (1997: 7). This is true, except that the *form* this assumes in this instance relates to the *intensity* of the working day by *non-mechanised* means.

normally ‘pursue absolute and relative surplus value simultaneously’ (West 1983:268). Modern legislation limiting the working day notwithstanding, ‘capitalists may still attempt to increase absolute surplus value’ (Catephores 1989: 68).

In production, employing the first option, extending labour time overall (i.e across the whole workforce), should theoretically increase surplus value and hence profits absolutely. This extension held the promise of major advances in productivity and was initially enthusiastically embraced in the industry at large, including by workers. The second option intensifies the deployment of labour-power, hence increasing economic surplus and profits relatively, by virtue of ‘a change in the relative magnitudes of the components of the working day’ (Marx 1977:479). This option, as will be seen, was similarly enthusiastically embraced by labour in the few instances where it was implemented.

The first option consumes further human labour-power straightforwardly via its prolongation, shaping social organisation and social formation generally. The second option requires greater attention to the physical, environmental and organisational conditions under which human agents intensify and advance the productivity of their labour, in this instance with no (or very limited) additional mechanised means of production.

With regard to the first option, reduced working hours for individual workers become possible, but such hours are irregular and variable. With continuous operations, the hours of work of abstract social labour are extended, despite reduced working hours for the individual worker (Marx 1977:477).

Regarding the second option, the configuration of existing working hours is changed, generally with a longer working day, but along regular lines, with working time arrangements coinciding with those of societal norms - the widely preferred ‘evening and weekend society’ (Baker *et al* 2003:316).

In the first instance, however, 'time off'[233] is individualised.[234] While the *duration* of time spent at work is technically reduced, the *timing* of working hours changes and introduces irregular patterns to daily life (Berg *et al* 2004). The limited degree of control over time, which was previously regular and relatively predictable, except for forced overtime at short notice, is lost. The *uncertainty* that characterises underground mining like no other occupation (Spindler 2001) is now replicated in *social* life. The worker is out of temporal kilter with the routinised patterns of her community, in other words with her very socialising structuring *habitus*. In the second instance, 'time off' remains embedded within the temporal rhythms of her established communal structures and the familiar lived experience of life, which realm and domain can hence be called, or is, the *truly social*. Here, in order to reduce working hours, significant emphasis is placed on the efficiency, intensity and quality of labour-power, requiring an even greater focus on the re-organisation of work and the ready availability of the labour and materials necessary for production which, when efficiently organised, saves time. This option raises the paradox that although workers are technically subject to greater exploitation (assuming Marx's technical definition) as socially necessary labour time is reduced and hence surplus value increases, this formally signals a progressive (perhaps even historically necessary) development in the productive forces, which always assumes a specific form. For, as but noted in Chapter three, Bellofiore and Finelli assert that:

[233] The implementation of continuous operations (Fulco) rarely resulted in reduced hours (see Lewis 2001: 30). Similarly, Adler's study did not support the view that shift work (representing continuous operations) necessarily results in time off for the individual worker. Additional time spent travelling, added production responsibilities and overtime resulted in shift workers experiencing demands on their time to which day workers were not subject (1991:80-81). Overall, under capitalism, labour time has not decreased, but rather increased (Boneveld 2004:121). The shift to industrial society and mechanisation does not decrease labour time (Minge-Klevana 1980).

[234] In the European context, the flexibilisation and individualisation of work time schedules have increasingly been seen as tools to improve economic competitiveness (see Glorieux, Mestdag & Minnen 2008:64). In South African mining, while working hours have been individualised in one sense, this does not mean that individual workers have the ability to flexibly control - increase or decrease - their own working hours (see Berg *et al* 2004). As Catephores notes, generally speaking '… as an individual, the worker has virtually no control over his working hours, these are fixed by works regulations, similarly for all employees' (1989:68). Even the 'flexi-worker' has no control over the number of hours worked, only their configuration over a set period of time.

> In *Capital* it is the class struggle over labour time (and everything that directly or indirectly affects it) that explains why a given productive configuration (the methods of production and quantity of labour actually performed) is as it is and not otherwise (1998:60).

The point here is to indicate more specifically the relationship between the 'productive configuration' and its social effects and implications.

The 'crystallised' labour of 'dead generations' embodied in fixed capital, for instance, cannot be permitted to lie idle, as Marx pointed out a long time ago (Burkett 2000:147). Capitalists have indeed put this 'crystallised' dead labour to maximum use ever since.

It is precisely this point that goes to the heart of the 'ideal' situation presented by the industry to the Franzsen Commission in 1977, i.e. that capital-intensive machinery cannot afford to lie 'idle'. This represents 'lost' (historically unavailable) surplus labour time (Booth 1991:15). The industry raised the idea of variable hours regimes, i.e. continuous '24 hour' operations. This was not a new idea. Continuous work had been instituted in the very earliest days of the diamond mining industry and is standard procedure when sinking a mine shaft (Guy & Thabane 1988; Oxley 1989). A continuous operation shift roster was also implemented with the only, ultimately abortive attempt at full mechanisation on selected gold mines, namely the Trackless Mechanised Mining Method[235] (Frost 1987; Davies & Head 1995; Herrick 1998).

The reason the industry in the late 1970s could not seriously advance either continuing with a six day week or moving to continuous operations were *social* reasons. Organised labour, the industry surmised, would not have countenanced it, seeing they had been struggling for a five day week for the previous four decades. Reverting to the six day week would have, moreover, by the industry's own admission, been (socially and politically) 'retrogressive' (Chamber of Mines 1978:Page A). Neither would a 'rostered

[235] This attempt at full mechanisation - dubbed TM3 - failed primarily as a result of too great a 'dilution' of the ore grade due to the wide stope-widths the technology required. The shortage of properly trained diesel mechanics was also cited as a reason by an informant.

system', i.e. continuous work, have found favour as this would have involved Sunday work - which is where organised white labour's struggles over the working time started in the first place, as Chapter four showed. Yet only a decade later, blasting would again take place on Sundays in continuous work schedules, the prohibition on Sunday work in the Mines and Works Act of 1911 effectively nullified (see Lewis 2001).

Moreover, in mining locally, not only was the development of the productive forces to run up against the 'fetters' of strained social class relations, but it remained framed against natural geological conditions. Ever since the late 19th century, when the reef was found to dive down kilometres deep, it was clear that mining the Witwatersrand Basin required massive tranches of capital and labour time expenditure. In order profitably to mine the Witwatersrand Basin's thin and often irregular ore-bearing reefs of hard quartzite rock requires very narrow stope-widths. This has precluded full mechanisation of the mining stope rock face on gold mines.[236] At the rock face, even (very) partial mechanisation, via the use of rock drill rigs (also referred to as 'jigs') has still not been implemented widely. As previously noted, even in platinum mines only 14% of underground production is run on trackless,[237] low-profile mechanised equipment (Bonner & Stewart 2007). The hand-held, labour-intensive, percussive machine rock drill, on both gold and platinum mines, continues to prove itself as the most reliable rock breaking technology. This requires maximising 'face-time' - *actual direct hours* spent productively working at the rock face.

To repeat, historically, organised white labour's struggles for reduced working hours could not be entertained, not solely because of the income privileges above the value of

[236] The attempt in the mid-1980's to implement the Trackless Mechanised Mining Method (dubbed TM3) proved abortive - as did this writer's attempt to predict as much to the consulting engineer, Mr Brian Bamford in the 1980's at Western Areas Gold Mine belonging to the Johannesburg Consolidated Investments (JCI) mining group.

[237] 'Trackless' mining makes use of motorised machines; mobile drilling machines and load-haul dumpers, in particular, which are driven by an operator, obviating the need for locomotives which run on narrow-gauge railway tracks to transport ore.

their labour power as argued in the previous chapter, but rather because their absence underground reduced the value of African labour power - by reducing the actual (direct and indirect) net surplus value producing labour time these workers spent underground. Consonant with the tradition, white workers' struggles for reduced working hours were traded off, bit by bit, by 'diluting' their skills and granting additional and increasingly generous leave, in other words time off from work. The point is that as labour and labour-power constitute a natural, material and social force and production is 'both a material and social process', labour time is consequently subject to both 'physical and social bounds' (Burkett 2000:145-146).

The contextual point to note, however, is that in a developing context, this occurs where relative surplus value is not yet 'the socially predominant form of production', and, in important ways, where the subordination of labour to capital remains formal and is not yet real (Marx 1977: 478). This is important. For under conditions where labour is not fully (really) subordinated, or for some theorists, cannot be (Cressey & MacInnes 1980; Maller 1992), the character of the resistance to the prolongation of working time, and particularly its rare and slim victories, is qualitatively different from the historically defensive nature of working class opposition in advanced capitalist formations. For when the latter were at the same 'stage' of development, there was no other option. On the English collieries, for instance, longer hours were instituted due to 'the demands of capitalising industry' (Rule quoted by Voth 2000:10).

Michael O 'Donovan similarly argued that:

> …mechanisation that occurred in the stopes did not did not mark the complete transition from 'formal' to 'real' subordination of labour, rather it marked the real gains of control over the labour process by black miners (1985:68ff).

This applied particularly to the team leaders and the '…machine operators' (drillers and winch drivers who operated scrapers and supply winches)' who 'also gained greater control over the same process, particularly over the *rate* of production (O'Donovan's

emphasis). Critically, 'the pace of work was not set by the machinery but by the operators' (1985:689).

Latterly, under contemporary local conditions, as elsewhere (La Jeunesse 2000), there is the rational option of instituting reduced working hours, by focusing on workers' *production demands* and increasing surplus value by reducing labour costs per unit of output by non-mechanised means. Working time and leisure time are two sides of the same coin: mine workers *demand* more efficient production processes and organisation to win time off out of the pit. The question arises whether the absolute prolongation of working hours is, strictly speaking, either socially or historically necessary where *conscious control* over production can potentially both increase production and decrease working time. This is the force of La Jeunesse's entire thesis. The problem is that worker control - or enhanced degrees of such control - over production embodies the potential threat of destabilising capitalist hegemony over social class relations both *in* and *of* production, especially where, following on from racialised workplace regimes, levels of social trust are low, as is generally the case in mining in South Africa. The allocation of time, its control and expenditure, which regulates production and implicates changes in social relations, comes to represent the renewed *crux* of the matter of how 'value' *per se* is created.

In mining locally and perhaps more generally, where time has not yet assumed the shape of the emerging '24 hour economy'[239] (Glorieux, Mestdag & Minnen 2008), and the struggle over time is paralysed by a working time arrangement neither capital nor labour finds satisfactory (as is the case with the ESF) there are the two options: absolute prolongation overall (with detrimental social effects) or increasing its relative intensity, by non-mechanised means (in order to preserve its more traditional rhythms). The point here is that restructuring labour time principally either requires the re-organisation of the configuration of social relations of *control* over the labour process or necessitates changes

[239] Social services such as law enforcement agencies, prisons and hospitals have long manifested the temporal regimes of the emerging '24 hour economy'. Transportation - petrol stations, trains and airways, and their related services - and continuous flow production operations such as the petro-chemical and steel industries and latterly call centres, represent its cutting-edge locally.

to a wide range of *social* issues centralised around the preservation (health and safety) and consequent reproduction of labour power in order to ensure the continuation of capital accumulation.

What follows can but note elements of the empirical evidence regarding what Chapter four characterised as the third period in the history of working time arrangements in South African mining: the contemporary period of diversification beginning around 1991, through to the present. The series of working time arrangement 'experiments' to restructure working hours, attempted across the gold mining sector and more latterly in platinum mining, divided fairly neatly into two clearly identifiable types of social arrangements: continuous production shift arrangements with variable hours for individual workers, and the five day working week with 'regular' hours for workers as a whole, in which the 'mine week' and the 'man week' coincide. These two working time options correspond to the two conceptually defined options noted above. They further represent the respective options of capital and labour. The middle way, mirroring the compromise reached in 1978, has subsequently involved tinkering with the ESF and has not been satisfactory from either labour or capital's perspective - the competing social rationales for which constitutes a separate study not broached in this thesis.

Where this matter was broached in relation to working time arrangements, the *social* effects of continuous work regimes assumed prominence in the only dedicated academic study on shift-work (i.e. continuous production operations) in South Africa.

> Shift work must be seen against the backdrop of the wider society. Companies who operate … shift work systems need to consider carefully the social implications of the system on the lives of their employees. The absence of any such consideration not only affects production directly as a result of employee morale and productivity, but will come home to roost in the quality of life in society in general (Adler 1991:76).

It is significant that aspects of the 'wider society' should be taken into account. For this signals that the absolute extension of labour time as a whole results in changes in the 'quality of life in society in general', and hence the form society assumes, down to the

very ‘composition of society’ (Marx 1977:477). Such institutionalised social change occurs especially in response to changes in the patterns and rhythms of labour time expenditure when operating hours are extended to their absolute temporal maximum[240] by continuous operations. With production running 24 hours a day, seven days a week, the temporal regimes of factory and mine articulate with and change those of contemporary society, much as the temporal regimes rung by the bells of the church and regulated by the clocks of merchant capital did in previous centuries and came to dominate their respective societies (Landes 1980; Le Goff 1980; Postone 1993:200-216).

The outcome of a rarely-documented five day work week ‘experiment’, conducted in 1997, is briefly discussed in this light. An abbreviated discussion of a highly contested five day work week ‘pilot project’ then follows. This latter experimental, six-month-long project on a platinum mine shaft in 2003/4 resulted in further intense contestation and an organisational stalemate between management on the one hand, and the trade unions and staff associations, united across the old racial divide, on the other. Such was the intensity of this conflict that social science was invited and paid to intervene.

7.2 Design criteria for continuous working time schedules

On the South African gold mines in the early 1990s there was a ‘general rush’ to introduce continuous shift[241] and night work, with industry-based research on working time only *following* experimentation (Kielblock 1998:27). Continuous work soon became a contested social issue. Julian Ogilvie Thompson, chairman of Anglo American, defended the turn to continuous work by arguing that the industry was only operating fully on 275[242] days of the year (Kielblock 1995:Preface). Meanwhile, the National Union

[240] To repeat, this absolute temporal maximum is not to be confused with the physiological maximum number of hours in the working day an individual worker can work (Wright 1981).

[241] Shift or continuous work was defined as ‘24 hours a day, 365 days a year’ (Kielblock 1998: Preface, 39).

[242] 275 shifts are worked annually on the Eleven Shift Fortnight. As has been seen, generally 313 shifts were worked serving out the migrant labour contract, but which normally took longer than a year to complete, hence the industry’s attempt to compress time in the era of globalisation.

of Mineworkers (NUM) opposed continuous operations (Crush *et al* 2001:8) and decried the '*ad hoc*' approach adopted with the implementation of continuous shift work (Kielblock 1995:Summary). Kielblock, supportive of the NUM's contention, recommended legislative review and the following of international 'norms and standards' based on 'full participation and ongoing monitoring' (1995:Summary). It was acknowledged that the adverse effects of shift work on workers 'impinge on the whole of their lives' (Kielblock 1995:1). Despite the extraordinary range of negative consequences of shift work for workers' health, the medical doctor Kielblock noted that 'social factors can outweigh biological ones in determining night shift safety' (1995:16).

Over a decade ago the then available, almost exclusively prescriptive, guidelines on shift-work were belatedly reviewed in order to assess the extent to which local mining working time arrangements met internationally accepted design criteria (Kielblock 1995). A series of general guiding perspectives were taken from the international literature and it was suggested they were 'fundamental to the design of equitable schedules of shift and night work' (Kielblock 1998:5). Ironically, but not surprisingly for the argument being advanced here, productivity took a back seat, despite being noted as follows by the Leon Commission the same year: 'The gold mining industry should not lose sight of the fact that higher *productivity* is a crucial means of reducing the large number of serious and fatal injuries' (Kielblock 1995:39, citing the Leon Commission).

Yet it is precisely production constraints and workers' production demands that come into focus when changing working time arrangements have the reduction of regular hours in non-continuous shift schedules as their aim. However, to the best of my knowledge, discussion of issues of production (Webster *et al* 1999; Webster *et al* 2001; Phakathi 2001) is not to be found, in any of the extensive current literature on working time matters - let alone discussion of production's dysfunctions.

Dr Kielblock's final emphasis on productivity, which was that the 'fundamental framework' for continuous shift work '…should be based on international standards and norms, [which lagged behind developments], local legislation [which did not take the

specificity of mining into account] and research' [of which there was effectively none] (1995:40, 1998:7), has yet to be fully realised.

Dr Kielblock concluded and three years later repeated that:

> Even a cursory analysis of schedules presently in use on local mines is indicative of the extent to which elementary guidelines on shift work have been ignored (1995:40, 1998:7).

Even after this finding it is not clear to what extent guidelines were available at shaft level where the experimentation had been in full swing. More important was that negotiating labour time was breaking new ground for both the industry and the unions - not least because it implicated issues of control, previously the exclusive preserve of management (Bezuidenhout 1999). Once implemented, the entire focus was soon to centre on how to attenuate its worst effects on workers' health. In the face of continued resistance and disappointing production results, around a decade later, the initial enthusiasm had waned and continuous work was largely discontinued by virtually all of the larger gold mines. The same applies to platinum mined underground.[243] Before this occurred, however, continuous work was assessed and evaluated more systematically in a further SIMRAC study.

7.3 Assessing local shift arrangement 'experiments'

The international guidelines miss what the highly prescient 1978 management report on the MWU's striving for a five day work week does not: changes to working time are inextricably bound up with the reorganisation of production.

Almost a decade ago Lewis posed the question in the following manner:

[243] This point requires further empirical investigation to establish the manner, timing and extent to which this is in fact the case, this conclusion having been reached from fairly extensive visits to and familiarity with conditions on a number of gold and platinum mines across three of the large mining houses, AngloGold, Gold Fields and Harmony, since 1999.

> … the 48-hour week survived 86 years into the 1990s, like a dinosaur that escaped extinction. If it is not to survive in the gold industry in the 21st century, employers must begin to ask … 'How can we finance the increased labour costs that will arise from implementing Fulco with a shorter working week,[244] by increased productivity of all factors of production? (2001:49).

The fact that many workers, most especially at the rock face, currently work longer than 48 hours a week, attests to the difficulties encountered in attempting to reduce working hours. For this implicates social relations at work and managerial defence of maintaining the *status quo* with regard to working hours, precisely because of the difficulty of increasing the productivity of 'all factors of production'. When it appeared that continuous operations would dominate working time arrangements, Lewis proposed:

> Further research into particular mines is needed to investigate more closely the complex relationship between the factors … shorter working hours, productivity, health and safety and seven-day operations … [to] establish whether a positive trade off between better working conditions and productivity can be achieved… (2001:47)

Lewis pointed in the direction research should take. When defining aspects of the complexity of the mining production and labour processes, such as productivity, safety and working time arrangements, the *production demands* of workers, which are generally ignored, must, finally, receive a response. Beyond mining at the time and more broadly, such production issues have taken a back seat, not least due to reasons relating to the oppositional trajectory of the mass-based unions and the lack of relevant skills and knowledge regarding production issues on the part of trade unionists (Buhlungu 2000), to say nothing about the still weak bargaining institutions at the time (Baskin 2000:50ff). On the gold mines in the early 1990s, it was on the promise of enhancing blasting capacity in the stopes by 25% in a time of crisis that galvanised capital and labour into combined

[244] For Lewis a 'shorter working week' refers to the 'man week': the working time of the individual worker in the context of a seven day, continuous operations, 'mine-week' (Lewis and Wegner 2000: 7; see also Franzsen Commission 1977:101).

action to adopt continuous working time arrangements. The results turned out somewhat differently.

A decade ago, the *actual* overall outcome of Fulco in gold mines (appended to this chapter) was re-evaluated by Lewis (2001:45) following his SIMRAC report (2000). From the perspective of the industry the results were disappointing. The number of sub-contracted workers, which had begun to increase significantly, essentially disabled a clearer picture of the impact of continuous work time arrangements. This coincidence suggests a strong relationship between labour time and the way subcontracting was used to institute the managerial strategy of 'authoritarian restoration' (see Buhlungu & Bezuidenhout 2008:14-15). For subcontracting workers, working at lower rates of pay without benefits, is nothing other than devaluing the value of labour power and increasing relative surplus value by altering the relation between paid (necessary) and unpaid (surplus) labour. One underground platinum mining shaft on continuous work, incidentally, is staffed entirely by sub-contracted labour. All open-cast platinum mines work around the clock. The longest strike in mining in 2007 was over working continuous work schedules.

7.4 Internationally emerging shiftwork design criteria

The account thus far has represented the state of play in 2003, when the struggle over working time resulted a stalemate between unions and management across a platinum mining house involving 30 000 workers. At this point a call went out from PGM for external intervention by way of 'independent' research. The job was to propose working time arrangements acceptable to both parties. Employing a simplified and rudimentary summation of the design criteria, as formulated in 2003 by the ILO, a series of local shift schedule 'experiments' conducted since 1991, which were, in addition, compliant with then recently promulgated BCEA legislation, were evaluated. Non-compliant 'experiments' - of which Kielblock (1995) found many - were ignored.[245]

[245] The industry continues, however - or at least did up to 2 November 2007 - to run shift systems that do not comply with even later, more carefully formulated criteria, such as permitting quick shift changeovers twice a month (officially sanctioned by the Director-General of the Department

What emerged from the international experience of shift and working time arrangements - and repeated itself locally - was that the variety of permutations is limited only by the ingenuity of those who devise them to suit specific and local conditions. There is consequently a considerable literature on the design of shift systems, shift-work schedules and the effects of shift work, all of which have the social aspects of occupational health and safety issues as their principal focus (Lewis & Wegner 2000:8). This central focus on health and safety consequences of structural changes to working time arrangements had, however, been reported only three years before to be 'very undeveloped' in mining contexts (Heiler 2000b:2). Once again, the local mining industry had to invent a new set of temporal wheels.

The recommendations of the ILO's leading researcher, Norman Jennings (2002) paraphrased the authoritative voice of the Encyclopaedia of Occupational Health and Safety (1998), an indication perhaps of the paucity of work conducted. Jennings's shift design recommendations moved from prescriptive criteria to specifying in greater detail the technical requirements required of a reasonable continuous working time schedule.

Jennings further established design considerations regarding job and life satisfaction and their relationship, responsibilities for establishing and regulating shift schedules, and the monitoring of issues arising. He recommended foregrounding the issue of fatigue, which was 'undeveloped in the international mining community' (2002:35), and called for attention to the 'so-called "soft" issues' of 'family and other caring responsibilities' and how these are 'fundamentally related to performance and productivity' (2002:35). Work done elsewhere, however, further specified these general guidelines.

7.4.1 Design criteria on mines in Australia and Tasmania

Australia provides an instance roughly comparable to the South African case: there, despite a statutory 38 hour working week at Federal level the average length of the working week in the mining industry in the very early 1990s was just less than 52 hours. This was not only the longest of all industries on that continent, but had also accelerated

of Labour).

the most rapidly between 1993 and 1997 (Heiler, Pickersgill & Briggs 2000:12). In addition, 'as of 2000, mining had the largest proportion of its workforce working over 60 hours a week' (Jennings 2002:28). The Australian case was characterised by 12 hour shifts and extended working days subject to extensive bargaining, with occupational safety being a joint union-management responsibility. Caution, research and a more sophisticated approach were advised when changing shift schedules. It was suggested a 'trial period' precede the implementation of any new system (Jennings 2002:30).[246] In closer detail, the focus again cohered primarily around health and safety issues, detailing the number of hours without a break, time off between shifts, workloads and intensity, exposure to hazards, and considerations of 'social and community life', including family responsibilities, travelling time and rest breaks (Jennings 2002:41). A further set of findings emerged from a study of extended shifts in the mining industry in Tasmania, where the 'growth of 12 hour shifts' was found to be consistent with trends emerging in Australia (Heiler 2002:7). Heiler's specific findings, moving from empirical observation to a substantive conclusion, emphasise my argument regarding the complexity of social issues and effects implicated in changing working hours.

While 12 hours shifts were again found to predominate, concerns were registered around adverse effects on health and safety, which had proved to be well founded, including, but not limited to, sleep deprivation, fatigue and performance impairment. Health and safety systems were found to be inefficient or non-existent, and rosters were adversely affecting the quantity and quality of family life, with social costs being born by workers, their families and the larger community. Changes were creating new work hazards with which occupational health and safety (OHS) legislation was unable to deal effectively (Heiler 2002:2).

In the case of Tasmania, Heiler concluded that 'serious gaps' in the regulative 'mechanisms available to effectively address' problems, both 'emerging and latent',

[246] Regarding this last point, in the South African case, 'pilot projects' proved to be par for the course (Lewis and Wegner 2000:2). Most 'experiments' have remained just that, resulting generally in a return to the *status quo* ESF.

required attention ‘to ensure a better balance between the needs of the industry, workers and their families is achieved’ (Heiler 2002:2). In consequence, Heiler called for greater State intervention to protect mine workers and their families, focusing clearly on reproductive, i.e quintessentially *social* issues.

The literature on the topic of the social impact of continuous work internationally is as voluminous as it is sparse regarding mining in South Africa. It can simply be noted here that the literature is unequivocal regarding the fact that shift-work interferes with social life more than it facilitates it. There is unanimity across studies that it disrupts family and social life, which comes into focus when continuous work schedules are implemented. Individual responses to shift work vary widely (Baker *et al* 2004). Research conducted in South Africa beyond mining by Mets (1986), Metcalf (1986), Adler (1991), Goldman (1992) and Goldstein (1996) have all pointed out that the social costs of shift work are high, impacting on unpaid travelling time, inadequate sleep and health problems, resulting in increased sick leave and injury rates.

On a South African platinum mine, consequently, workers in 2003 expressed concerns in relation to the possible implementation of continuous operations and clearly preferred to work a five day working week, very few working time arrangement ‘experiments’ having being devoted to exploring this option. Only one such experiment was found to have been documented.

7.5 The St Helena five day work week experiment

This five day week project, conducted for 12 months between 1997 and 1998, typifies the extent of flux in working time arrangements since 1990/1. It followed a failed Fulco experiment conducted in 1995/6 that saw labour costs increase by 30% with a decrease in productivity from 7,2m^2 to 4,6m^2 per man per month (Nell & Herholdt 1998). Like the slew of ‘experiments’ flowing from the 1990 Mining Summit, this project flowed from the Productivity Improvement Agreement negotiated during the 1997 Chamber wage negotiations. This experiment was deemed to have been implemented ‘relatively successfully’ (Nell & Herholdt 1998).

St Helena was a mature mine employing scattered mining techniques; an average travelling time to working places of 60-90 minutes per day, plus 12 public holidays, resulting in concern over low face times, in other words, actual or direct (net surplus value-producing) labour time.

St Helena Productivity Improvement Agreement: The 'Five Day Working Plan'	
Objectives	An additional 605kg gold, 20 000m^2 & 100 000 tons per month, i.e. a goal of 29% improvement in productivity.
The Parties	The company and NUM were the principal parties; SAEWU (South African Electrical Workers Union), the MWU, ATEASA (Administrative, Technical and Electronic Associations of South Africa) UASA (United Associations of South Africa) and NETU (National Engineering Trade Unions) agreed.
Productivity	Increased by 38% from Aug 97-Aug 98. Increased to 18-22 m^2 per man per month. Grams of gold rose from 100 to 153,4 per employee.
Working hours	9 1/2 hour shift commencing at 4 am at worker request. 30 minutes' casual unpaid overtime, thereafter paid at overtime rates - without payment if no blast was achieved.
Public holidays	Worked in on Saturday at public holiday rates.
Voluntary Saturday shifts	To be worked by agreement.
Lost blasts	Worked in shifts on Saturday as normal time.
Accident rates	Deteriorated from 2 per 1 000 to 5 per 1 000.

In evaluating this particular 'experiment', the organisation of work assumed the focus of attention. It was noted that the definition of 'completed work', in other words completing the support, drill and blast cycle, was not being followed. It appears workers were leaving the face and failed to comply with the informal, but time-honoured, mining tradition of ensuring a blast. That productivity, measured by the amount of gold actually produced, nevertheless rose by 38% is remarkable, indicating a significant change in the manner in which control was exercised over production itself, details of which were regrettably not recorded. Lost blasts, due to 'blast-unfriendly faces' were, however, recognised as a management responsibility. These shifts were 'worked in' on Saturdays as normal time, as were all the public holidays. Of significance for the argument that the labour process

becomes the central focus when five day work weeks are attempted, is that this arrangement was concluded after interminable debates between management and unions as to who was responsible for lost blasts. Voluntary shifts were implemented, such shift arrangements not readily receiving managerial assent as direct control over production is lost. This is due to uncertainty as to whether work gangs underground would have their full complement.

Working a five day week (generally including some Saturdays) does not mean social factors do not attract attention. On the contrary, the social cost accompanying the massive productivity increase was the deterioration of the accident rate.[247] It was found that the monitoring committee, primarily a union responsibility in this pilot, was not functioning optimally. Having voluntarily elected to start the shift an hour early, i.e. 4am,[248] workers were skipping breakfast, leading to a management investigation of the relation between early starting times[249] and the accident rate. The Australian worker responsibility of 'fitness for work', not then and still not a general phrase in the local lexicon, was not being applied, formal guidelines only having been issued locally in August 2000 (DME 2000). Such is the nature of complexity in restructuring labour time that the entire project failed to be an unqualified success: the monitoring committee omitted to ensure the mineworkers were eating breakfast, to which the increased accident rate was reportedly linked!

[247] This is currently referred to as the 'lost time injury rate', with 'dressing cases' referring to incidents where no working time is lost.

[248] This was and is not unprecedented. Breckenridge indicates that this was the starting time for the shift in 1940, as it was in 1999 for some of my roommates (1998:72). Such shifts are not regarded as night work.

[249] The early starting time at the request of workers confirms international findings that recommended practice is frequently ignored; early starting times not being recommended (see Jennings 2002).

7.6 The Platinum Group Metals five day week pilot project

The stalemate over labour time on the platinum mines followed a five day week project that had, in turn, flowed out of tense wage negotiations. The pilot project was constrained in its founding document, negotiated by management and the trade unions and staff association, by the 'stringent' conditions that there be: 'no deterioration of health and safety standards, no increase in costs, no loss of production and no decrease in efficiencies'.[250] Failure to meet these conditions led to deep disappointment, resulting in acute tensions and antagonism on the shaft, which were formally acknowledged as the 'differing views of the parties', i.e. management and the unions.

Nevertheless, as mining infrastructure frames productive capacity underground, a broad and extensive range of infrastructural arrangements was made at the shaft. Sorting out a range of technical matters was designed to facilitate achieving the same number of blasts in five longer working days as in five and a half days. For the union men, particularly the skilled staff association men, it was the late delivery of these arrangements that most severely impacted on the overall unsuccessful outcome of the project. One of the critical mining engineering improvements implemented, but which occurred late, was to a problematic ore-bearing belt on one of the shafts.[251] The artisan staff association men were convinced the pilot had been 'designed to fail'. There were conflicting interpretations of the results of the project. Two technical reports were drawn up - both attempting to measure productivity when working time arrangements had changed. One was submitted by management and the other by the unions and staff association. The differing interpretations of what had actually transpired contributed to the continuing intensity of sensitivities on the shafts where the pilot took place. This still simmered across Platinum Group Metals a year later and led to the external company-wide review to be treated in the chapter to follow.

[250] Platinum Group Metals, 5-Day Week Pilot Project, Terms of Reference Agreement.

[251] The malfunctioning belt was preventing workers from achieving their production targets.

The subsequent evaluation broached a wide range of framing issues, such as targets and productivity and health and safety. Factors affecting working time arrangements included workers' overtime, public holidays, weekend work and shift preferences, and workers and managers' willingness to work different (variable) hours. Suffice it to say, half of the respondents preferred a five day work week, 33% being prepared to work variable hours in a continuous shift roster with 10% prepared and willing to work on Saturdays, with the ESF only attracting 7% as a first choice as a working time arrangement.

Regarding the factors affecting productivity, fully endorsed by workers in focus groups and individual in-depth interviews conducted across all occupational groups, alongside problems with machinery, the lack of materials registered as the single most significant element inhibiting productive capacity on the shafts of the mine hosting the pilot project. Across gold and platinum mines this constitutes a continual lament of working men underground (Webster *et al* 1999, 2001; Phakathi 2001). A full 48% of workers construed the lack of materials to be a 'big problem', with a further 14% believing it to be a 'small problem', but a problem nevertheless. Problems, 'big' and 'small', were noted with machinery (62%), absenteeism (58%), safety (47%), social relations at work (41%), the shift system (40%) and the lack of necessary skills (38%). Combined, these factors signal a significant degree of time-consuming and wasteful *disorder* underground, requiring extensive worker improvisation, dubbed *planisa* in mining parlance (see Phakathi 2001). A further series of issues clearly bedevilled the strenuous co-operative efforts of the mass-based trade union men and the artisan-based staff association supervisors in trying to get the five day work week project to succeed. The extensive use of all channels of communication did not meet desired outcomes. Only 63% of respondents were aware of the projects' objectives before it began. Only 77% of these respondents thought the pilot project objectives could be met. An unfortunate coincidence of highly contested trade union recruitment campaigns to ensure continued and renewed representation and positions on the joint company-union negotiating structures further contributed to the message not getting through sufficiently effectively. Some workers were not aware that the pilot project

was a pilot and thought it a permanent arrangement. Trade union representatives were alleged to have 'sold' the project as something *their* union had won. Around a year later some workers were still awaiting the findings of the project and remained unaware of the project's company-wide sequel.

With the flattening of organisational hierarchies in the general restructuring and reorganisation of underground mining, the attenuating traditional commanding authority of the mine overseers was further challenged by the perceived further infringement of their authority by the implementation team of the pilot project. This team, also responsible for monitoring and reporting reasons for lost blasts - often citing 'unfriendly' or unprepared faces not yet equipped and ready to mine - clashed with the mine overseers. That not all members of the implementation team were well-versed in practical mining matters, having been placed there as a result of trade union representivity and not necessarily mining competence, did not help matters.

The issue of face availability came to the fore. Union men quickly learned that a good or even excellent blasting frequency rate depends on blasting at least one working face every shift. It is, however, very difficult to achieve an SQDB[252] if you are a miner with no second or third working face at your disposal.

Problems of planning material supply and transportation are endemic to mining. It is little appreciated that the number of times material has to be handled in incline and decline shafts on platinum mines makes transportation, via continuous belt systems, decidedly more tricky perhaps even than in ultra-deep gold mines going down to below 3 500m. These factors coalesced into a trilogy of workers' production demands: Materials, face availability, labour.

There were no arguments, however, about the lost time injury rate, which improved by 25%, nor that workers (and managers!) were genuinely appreciative of the five-day week and extolled the virtues of the six-month long five-day-work-week project. That they got

[252] A 'Safe Quality Daily Blast' - an industry mantra.

to see their families featured prominently, as research then current also showed (Rabe 2004). As one worker said:

> We got the opportunity to go home and visit our family. We managed to go to the shops and bought ourselves and family some stuff. When we came back to work on Mondays we were fresh and ready to work because we had enough stamina. There were no injuries and unnecessary sick leave. There were no injuries, because people were fresh in terms of thinking and they were concentrating, not thinking about their family affairs (because we were working for only five days and had time off) and we had seen our families[253]. If we could (always) work five days we would be able to attend the funerals in the community. We could also have the opportunity to stay and talk with our families.

While it is simply not true that there were no injuries, a member of a focus group summed up these sentiments: '… the people were unhappy to go back to the eleven shift fortnight system, because the five day work week worked well for us.'

7.7 Conclusion

For reasons revealed by a value-theoretic analysis, capital and labour adopt diametrically opposed options when it comes to the restructuring of labour time. Capital prefers continuous operations in which the hours of work of abstract labour as a whole are extended, despite (technically) reduced working hours for the individual worker. Such daily working hours are, however, irregular and variable, disrupting social life. Labour, on the other hand, prefers a five day work week in which working time is more intensive and often includes a longer working day. Such hours may be longer, but run along regular lines, with working time arrangements coinciding with those of society at large. The important sociological point is how labour time structures *the social* in both options. It plays its formative, socially constructive role, however, very differently. *Social consequences* flow from capital's preference for continuous operations, while it is the

[253] This would not have been true of workers who lived a long way from the mines. When the five day working week was a much talked about prospect in 1976, some workers felt they would not benefit from a five day week as 'they did not have the means of transport to use the additional time to visit their friends and relations' (Moodie 1976:19).

social concerns of workers that prompt demands for reduced, but more regular and traditional, 'standard' working hours in the first place. On the South African mines workers continue to struggle for a more efficient, 'rational and economical use' of their labour time, necessary for the progressive development of the productive forces under capitalism (Julkunen 1977:8). When the economy of time is extended to its absolute temporal limit, as under continuous work, detrimental social effects and complexity arise, requiring virtually impossible degrees of micro-management and joint labour-management monitoring.

Perhaps the single most striking feature, at least of the two documented five day week experiments, was that workers *wanted* them to succeed: in one case worker and artisan representatives made strenuous efforts to ensure they did. Trade unionists and many workers clearly thought and believed they could have succeeded if only their production demands could have been met. They were prepared to work harder and even longer daily hours to meet their social demands for more regular working time arrangements, offering greater leisure time and time off to recuperate from the endemic fatigue that accompanies underground mine work.

Endeavours to reduce working hours continue, as the following two chapters will show. Where greater attention is given to workers' production demands, particularly around labour shortages, materials and face availability, it will become clear how workers' capacity to assume a greater measure of control over production potentially increases productivity within reduced, but regular, 'standard' working hours' regimes. The abiding challenge on South African mines is to do this safely. It remains to be seen whether the labour time of workers can be more rationally and safely employed when labour time restructuring occurs.

The discussion now turns to a case study where specific answers to these questions are quantified. For nothing less than workers' health and safety underground and the quality of life of workers (and managers) is at stake. What are and how do both workers and managers express their working time preferences and the complex range of issues

involved, and how hotly contested an issue is working time? This question is the focus of the chapter to follow.

7.7.1 Annexure I

The actual result of Fulco (full calendar operations) as compiled and presented by Lewis (2000: 45).

Criterion	Ideal Result	Actual Result
PERFORMANCE CRITERIA		
Ore grade	Increase	Decrease
Ore reserves	Increase	Increase
Total output	Increase	Decrease or static: Fulco could not have anticipated effect on overall ore production.
Labour productivity	Increase	Increase (related to production bonus and subcontracting)
Working costs	Decrease	Decrease (working costs were contained)
Working profits	Increase	Decrease
WORKING CONDITIONS AND EMPLOYMENT		
Health and Safety: Shift systems	Improve	Working time standards generally worsened – significantly in some cases.
Health and Safety: Injury and death rates	Improve	Injury rates improved. Death rate increased. Evidence of relationship between subcontracting, injury and death rates.
Wages/Salary	Increase	No noticeable effect: more data required
Employment	Increase	Limited stabilisation of employment loss in some cases. Evidence that shorter hours led to increased employment.
Employment Security	Increase	Decrease due to subcontracting

8 Bringing in social science

It's war! Now you are in the middle of a war!
Worker to social scientist

8.1 Resolving a struggle over labour time

Workers, across the company, were very dissatisfied after the failed five day week pilot project at Platinum Group Metals and continued to pressurise their trade unions to resolve the working time issue. This intensified the impasse between the worker organisations and management. After further protracted negotiations, management and the unions jointly decided to contract a third party to conduct a company-wide investigation into working time and evaluate the pilot project. The investigation was to serve as an 'objective' arbiter to resolve the struggle over the results of the five day week experimental project. The worker organisations eagerly anticipated the arrival of the researchers, while management received them somewhat gingerly. The worker organisations' strong, albeit naïve expectation was that social science would, from its supposedly neutral, privileged and authoritative stance, finally provide a definitive answer as to which specific working time arrangement PGM and the 30 000-strong constituency directly affected should adopt. The company's board of directors, directing unseen from afar, the chief operating officer in particular, almost certainly did not share this sentiment. Decades of their collective experience had presumably taught them that working time was not a matter with which one readily toyed. At any rate, the research consultancy contract was more specific: a written report was to assist a joint worker-management 'high level team' to make *its* submissions to the board of PGM.

A period of 16 weeks was allocated to the job. Only the quiet, generally long-serving and experienced men of the staff association were shortly to reveal their profound scepticism that many more months would instead be needed. They were to prove correct, the final

written report, on part of which this chapter is primarily based, being delivered exactly one year later.

What follows here is a reworked exploration and analysis of the significant quantitative data base and findings from qualitative research methodologies gathered during field work at PGM, as outlined in Chapter two.

This chapter begins with the international exploratory scan of the experience of working time. Two key findings culled from this research technique framed the research trajectory: changes to work time are 'site specific' and those initiated by workers stand the greatest chance of success. The key finding emerging from the South African mining experience - that working time and the reorganisation of the labour process remain intertwined and require simultaneous treatment - established itself as a guiding mantra from which there has subsequently been no reason to waver. Attention then turned to identifying and exploring a range of production-related factors that impacted on working time. The factors influencing the work-time preferences of the three distinctly identifiable occupational groupings of workers, supervisors and managers and the motivating forces behind those preferences, exploded into a complex matrix of pre-eminently *social* variables. No clear general patterns or statistical trends could be identified by which to steer the research process to its desired end, the emergence of a workable shift arrangement for PGM, thereby supporting the importance of taking the specific site seriously when considering changes to working hours.

Two very distinct empirical research findings did, however, stand out: leisure time consistently stood negligibly short of wages as workers' primary value, and the five day week very firmly established itself as the preferred work time arrangement overall. In line with the historical record, management was not, however, to move in the direction of reducing the hours of *both* the 'man-week' and the 'mine-week' as a five day week would require. Politically, as in 1978, they were not able to move in their preferred direction, (technically) reducing the 'man-week' for individual workers, but lengthening the 'mine-week' by introducing variable hours in a continuous working hours' regime. Modification

of the ESF was, instead, to be the focus, despite this option not attracting even 10% of respondents' preferred work time arrangement. This would again, as in 1978, reduce the hours of neither the 'man-week' nor the 'mine-week', but merely reconfigure them to permit longer extended periods of time off, for instance by way of working in a weekday public holiday and winning a long three day weekend later. More than this, at PGM workers worked 96 hours every two weeks averaged over two months - effectively the 48 hour working week instituted by the Mines and Works Act of 1911. This is a shift structure of six days on and one day off alternating with a five day week and the weekend off, enumerated over a calendar month as follows: 6/1; 5/2; 6/1; 5/2. This work-time struggle was eventually to hinge on two options. Management sought to maintain the traditional 22 or 23 shifts per month in a manageable and rationalised way by proposing a 6/1; 6/1; 6/1; 4/3 shift configuration, while workers continued to pursue the five day week as represented by a 5/2; 5/2; 5/2; 5/2 shift configuration, amounting to 20 shifts a month, thereby reducing the working hours of both the 'man' week and the 'mine' week overall.

Instead of recommending either of these options or any specific shift system as the worker organisations anticipated, the research presented a comprehensive report containing practical and detailed guidelines and criteria to be taken into consideration when changing shift schedules. Theoretically speaking, what confronted the joint management, trade unions and staff association 'high level team' at PGM most pertinently, was the old struggle over historically unavailable surplus labour shaped by the legally permitted length of the working week: the 45 hours a week specified in the Basic Conditions of Employment Act and the normal exemptions to work longer hours for which the industry can apply in terms of section 50(7) of the Act. The ongoing struggle over the length of the working week was again to result in the same, albeit slightly modified, compromise arrangement around the ESF. Even the arguments and demands made by workers echoed the struggle over the length of the working week of the Joint Mining Unions and the Mine Workers' Union in the late 1960s prior to the eventual establishment of the Franzsen Commission in 1977.

At shaft level, two opposing positions were clearly expressed. On the one hand there was the panoply of worker, union and staff association demands, views and opinions, and a state of general unhappiness. On the other hand, management, bolstered by an informal 'theory of [unalterable] constraints' relating to actual production outputs, implacably defended the non-negotiable requirement of continued productivity and profitability.

At corporate level, management was not to budge, there being a further crucial framing structural reason for this stance. Recent results at PGM had revealed a 63% fall in headline earnings per share despite having met production targets, the problem seen by a commentator at the time as PGM's inability to contain its costs, which rose by 18,3%. PGM's competitors' costs remained in single digit figures. Having managed to meet production targets, management did not believe it was possible to maintain the number of blasts achieved in five and a half days in a shorter five day work week. Without explicitly articulating it, management was holding on to the view of a generation before that the blast frequency rate was a function, not of the number of hours worked a day, but rather the number of days worked a week. There were too few five day week experiments to suggest this could be done, and their own five day week pilot project (discussed in the previous chapter) had become embroiled in less than certain and highly-contested results, at least as far as the bottom line of production itself was concerned. As this all became clear during the initial research phase of familiarisation and acclimatisation, the far broader picture gradually began to take shape as the international literature was reviewed.

8.2 The international experience of working time

In mining internationally there is no longer a 'standard working week' and shift arrangements have been characterised by increasing complexity (NOHSC 1995:21; Heiler 2000; Berg *et al* 2004; Lee 2004:29). Regarding working time in general, over 15 years ago it was noted that the duration and arrangement of working time 'is becoming increasingly disaggregated according to the needs of enterprises and sectors and the *preferences expressed by workers* [301](NOHSC 1995: 21) (my emphasis). In the context of

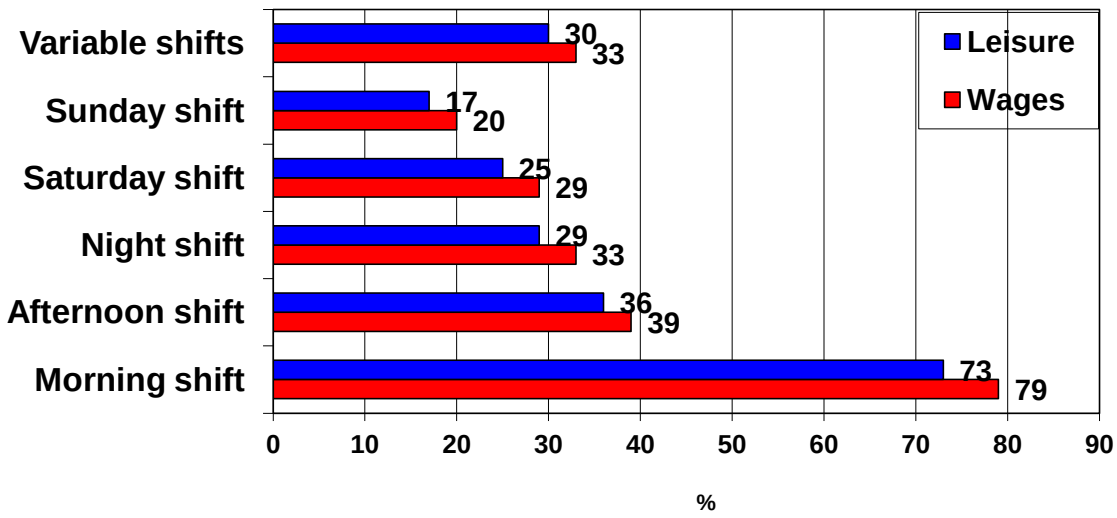
[301] This is the standard position adopted by neo-classical economics regarding working time, i.e.

industrialised countries, it has been argued, the 'primacy of employer-orientated flexibility has dwindled to some degree' as the growing recognition has dawned that 'workers' needs and preferences are not being reflected in their working time arrangements' (McCann 2004:15).

The utility of leisure and income expressed via workers' preferences has a long history and been subject to much debate (Nyland 1989). In contemporary society the value of time for workers tracks wages extraordinarily closely. Chris Nyland consequently draws attention to marginalist economic theory, which considers workers' preference for leisure as the main reason for the reduction of working hours - from around 60 a week at the turn of the twentieth century to around 40 hours a week in the mid 1970s. This hypothesis 'has gained all but total acceptance from the economists of the marginalist tradition' (Nyland 1989:20). Nyland's argument, on the other hand, is that the 'primary causal factors' responsible for changes to work time are rather 'the changing nature of the capitalist production process and the changing nature of the demands this process places on the psycho-physiological capacities of human beings' (Nyland 1989:ix).

In South African mining, the evidence presented thus far has been that workers' preference for reduced hours has indeed been the key factor driving changes to working time regimes, but that this has been strenuously and very largely successfully resisted by the industry on the grounds that production would suffer. Where continuous work regimes have been attempted and implemented on one of PGM's shafts, staffed entirely by sub-contracted labour, the reasons can be said to fall within the broad rubric Nyland indicates, namely that changes in working time relate to the 'changing nature of capitalist production'. Where technology stalled, working hours did not change. Workers in general nevertheless value leisure time very closely to wages. The following bar chart represents (by means of percentages of respondents opting for different shift schedules) the 30 000 employees at PGM.

that it is shaped by employee demands.



The question arises how the value workers attribute to their labour time, given fairly rigidly fixed production constraints, can be embodied in working time arrangements more amenable to the quality of life of mine personnel. The quantitative data base is used in a multi-variate analysis of the issues labour time throws up. In particular, it illustrates how changing labour time implicates the reorganisation of production and results in a complex matrix of intertwined issues, some strictly productive and others more generally social issues, quantifying the presentation in Chapter seven. What this chapter shows is that, in addition, a bewildering array of competing demands and stated preferences across different sites, occupational groups and economic interests also need to be taken into consideration to select a reasonable shift system.

Complexity aside, for the first time in the South African mining context, workers' views over the time they spent at work were systematically investigated. This resulted directly from the hiatus of the stalemate at PGM over working time. The preferences of workers (as well as supervisors and managers) were given explicit, though long-overdue attention. A subsequent survey of work time conducted on the international stage and more generally than mining argued that the 'ability to choose' any particular working time arrangement is the 'most important factor' in ensuring a balance between the needs of workers and employers (Messenger 2006:233). In much of the literature applying to advanced industrialised societies, however, such choice is presumed to apply at the level of the individual worker, whereas in mining in South Africa, by the very nature of the

labour process, such ‘choice’ currently still relates to negotiating the working time arrangement of the mine as a whole.

On the basis of the results of surveying all affected mine personnel, decisions would be made to select a working time arrangement the workforce considered the most amenable and management thought would enhance safe and productive mining. Yet for this to succeed, as a commentator, working in a completely different context, was to write only the very next year, worker organisations must exercise a degree of control over working time (Berg *et al* 2004). For any flexible working time arrangements to succeed, both the well-being of the worker and organisational performance of the enterprise must be satisfied (Berg *et al* 2004). The strong contemporary demand for a five day working week and the previous two decades of experimentation with working time arrangements had led to ambiguous and less than predictable results, in terms of both safety and productive efficiency. This signalled the need to test the preferences for the five day week and investigate the willingness of workers to work variable, irregular hours.

The refrain in the literature that where any working time arrangements are altered or changed, or flexible working arrangements are instituted, the dedicated involvement of both management and trade unions is critical, points to the essentially political and social nature of such exercises. There were competing interests. Workers demanded a five day week, the strength of which had, in the case of PGM, resulted in the pilot project in the first place. Management privately wanted continuous operations. I wanted to quantify my own research finding that central to improving the blast frequency rate was improving the problem of poor materials supply, which I had long identified as central to workers’ complaints regarding meeting production targets.

At the time this project was initiated, it was being argued that ‘some form of shared control’ over the duration and timing of working time ‘is the ultimate goal of policy’, and at the very least, where this is not possible, that the interests of one group be advanced without ‘harming those of the other’ (Berg *et al* 2004:333). As the previous chapter showed, Kathryn Heiler’s study of mining in Tasmania revealed that this had not been the

case with the drift to extended 12 hour shifts, which resulted in working class families and communities bearing the social cost of long working hours (2002).

The international literature, moreover, showed a strong tendency for any changes to working time to be 'site specific': 'What will work at one site could be completely unacceptable elsewhere' (Jennings 2002:27). Further, the success of any alternative may be the result of whether it was management or the workers who initiated it, worker-initiated interventions proving to be more successful (Jennings 2002). While worker and trade union pressure was the motivating factor for the investigation into changing working time arrangements in this instance, events will show that the issue of production constraints, primarily the concern over the blasting frequency rate, framed the research process. Management insisted, often in fairly subtle ways, on focusing (in line with the historical experience of the industry) on adaptations and modifications to the ESF working time arrangements. The very investigation of labour time itself was again to be hotly contested at every step, now that social science had entered the fray, in a three-way process between organised labour, management and researchers.

The contested nature of the issue goes to the heart of an argument pertaining to the mining industry over a century ago under very different conditions, yet powerfully instantiated at PGM. Talking about the ways in which the 'hegemonic domination by capitalists both succeeds and fails', Belinda Bozzoli notes a series of both coercive and less coercive forms of control employed in the development of conservative social ideologies: '…the embourgeoisement of workers; the tactics of "divide and rule"; the creation of controlling mechanisms and ideologies of the workplace ... and the ways in which particular kinds of trade unionism are cultivated by capital' (Bozzoli 1981:19). While in 2003 the age-old tactic of dividing workers along racial lines was tempered, by both a more modern corporatist bureaucratic managerial stance and an organisationally united workforce, all other forms of control noted by Bozzoli were in evidence as the question of working time was addressed across the sites constituting PGM. Defining a research agenda and shaping the tools of its execution represented a classic example of the 'creation of controlling mechanisms' and in turn define the 'ideologies of the workplace', let alone the way in

which ‘particular kinds of trade unionism are cultivated by capital’. In this case the trade unions and staff associations were continually embroiled in a complex bureaucratic corporatist model (Panitch 1986). While much more can be said here, this would take us away from the production issues around which this chapter and much of his thesis turns.

In brief, where the reduction of hours is concerned, from a historical perspective, the economics of the relation between the *duration* and *intensity* of work and productive efficiency has tended to go in circles (Nyland 1989). From a contemporary international perspective, where maintaining employment levels has been a major driving concern when talk of reducing working hours is uppermost, ‘mandatory work-sharing practices’, for instance, have not shown to result in sustaining significant employment; ‘voluntary work-sharing practices at enterprise level’, it has been argued, ‘*may* prove temporarily useful to sustain employment levels’ (NOHSC 1995:22) (my emphasis). It is not clear that the ‘virtuous cycle’ of ‘increased employment, shorter working hours, increased security and no loss of earnings for all workers’ would indeed be guaranteed by the 40 hour week, as Adler contended a decade ago (2001:1-2). The option of reducing working hours to save jobs, though often mentioned by workers when qualitative methodologies were employed, is of very recent vintage in the local mining industry. The idea was, for instance, subsequently mooted by a combined State, industry and labour task team in December 2008 in the context of addressing the October world economic crisis. Reducing working time generally leads not to further employment, but rather to ‘increased concentration of effort’; ‘rising intensity’ and makes ‘further reduction in standard times necessary’ (Nyland 1989: 15). In the current mining context, the first of Nyland’s contentions holds true. The second and third points are related: that further reductions in working hours are necessary when the intensification of work occurs was precisely what the mine workers’ struggle was all about and has yet to be achieved. Work has become more intense, but working hours have not reduced. This signals the continuation of a predominantly absolute surplus value extraction regime required by a production scenario heavily dependent on the hand-held rock drill.

Even closer to Nyland's argument that the transformation of production regimes under capitalism is primarily responsible for changes to working time arrangements and of particular significance in a developing context such as South Africa, is the still largely ignored finding of the Leon Commission (Commission of Inquiry into Safety and Health in the Mining Industry) that sustained employment generation is most likely from increases in productivity and output (see Chapters 3.1.4 & 6, 3.4). This became the central view of the research process. Workers continually cited impediments in production as reasons for not being able to work with the efficiency required to meet production targets within a reduced working hour's regime. As the following chapter will show, workers were keen to engage in meaningful encounters to encourage productivity, in order not to waste their labour time. Workers were, in other words, as elsewhere, 'wanting to play a positive role in bringing about rationalisation and further development of the forces of production' (Nyland 1989:x)

The emphasis, both in the research process and argued for here, is consequently somewhat different to that the literature, which argues for 'decent work' and 'decent working time' (Messenger 2006:221ff), the former having been prominently noted in the February 2010 parliamentary 'State of the Nation' presidential address. The stress, in the ILO-based research in particular, is that working time should conform to certain standards and criteria, the argument being that this will 'advance the productivity of enterprises' (Messenger 2006:223). It is in the enlightened self-interest of employers, then, to implement such recommendations, but historically this has been resisted for a variety of reasons, in England, for instance, ever since the 1830s (Nyland 1989:6-7). This perspective, harking back to prescriptive criteria, is, however, one *external* to production. Such a strategy relies on recommendations being implemented, either by the moral and practical sense of employers and capital in general, or imposed by way of legislative *fiat*. Yet where legislation *has* been enacted to reduce working hours, as noted, this is generally followed by an *intensification* of labour (Nyland 1989:21ff) (my emphases).

The orientation of the research was rather to quantify the prevalence of the demand for the five day week, identify the impediments in production preventing more efficient work

practices, and assess the strength of the constraints continually cited by management. The key point in what follows is to provide further empirical evidence for the contention that restructuring temporal regimes at work in the contemporary era is not just fraught with complexity, but impacts on an array of factors both within and beyond production, as indicated by the industry's submission in 1977 to the Franzsen Commission and shown above.

8.3 The key work time preference

The overwhelming evidence in the research conducted at PGM points to the five day week as the key preference of workers on the mines, both those represented by the mass-based, primarily black labouring workers and those in the staff associations, primarily white artisanal and supervisory mine personnel. It also proved to be the main preference of groups of manager employees. This strongly suggests a five day working week would constitute a 'decent' working time regime. Could this preference of PGM's employees, workers, supervisors and managers, be reconciled with the 'needs of enterprises and sectors' as the NOHSC (1995:21) finding suggests? While I present evidence to show this is possible, PGM did not waver from the long-established tradition in the gold mining industry: working hours would not be reduced.

On the basis of past experience, the research team insisted on taking seriously the workers' claim that they could *maintain* or even improve production while *reducing* working hours. A range of key factors, deemed to intertwine with and impact on working time, were consequently identified for investigation. These factors revolved around safety, targets and productivity. For the reasons cited and because modifications to the ESF constituted the primary focus of the research project, the attitudes and preferences for overtime, public holidays, shiftwork and shift schedules were examined. The core issue of different shift schedule preferences was further divided into a series of options.

8.4 Taking risks

Before even broaching these matters, the taking of risks needs to be placed in the foreground. In the significant literature on the topic, a recent contribution suggests the

concept of risk 'relates to identifying dangers and estimating' whether they will result in something going wrong, while the concept of safety relates to 'our ability to handle or control those dangers' (Antonsen 2009:7). Over a decade of this writer's own involvement in collaboratively based research has revealed risk-taking as a crucial aspect of getting the job done (Webster *et al* 1999, 2001). Risk taking and improvisation underground, construed as *planisa* on the local mining scene, has been systematically investigated and been found to be endemic underground (Phakathi 2001, 2011). Work done at PGM in 2003 fully supported this key research finding. In temporal, value-theoretic terms, workers *planisa* in order to get stints of 'wasted' *indirect* net surplus value working time behind them, so as to get on with bonus-producing *direct* net surplus value-creating labour time, enabling them to argue for reduced working hours on the basis that production has not only been maintained, but also improved.

The main reasons for taking risks were investigated across a colliery, a base metals mine, a gold mine and two platinum mines - both platinum mines being included in this research project - in an anonymous report entitled 'Cultures of Safety' (Anonymous 2005). It was shown that 63,2% of respondents cited production targets as the main reason why people 'take risks and break rules' (Anonymous 2005:11). The figures for the two platinum mine shafts, dubbed Mandla Mountain and New Mine, were 57 and 60%, respectively. Significantly, at these two platinum mines, the reasons 80% of workers at New Mine and 60% at Mandla Mine cited for accidents occurring was 'because of the individual or human error' (2005:6). While this finding may come as no surprise to managerial safety practitioners, the finding flies in the face of any structurally inclined sociology in general, and challenges a singularly innovative social scientific research intervention conducted on behalf of the National Union of Mineworkers 25 years ago in particular (Leger 1985). In the preface to this study, it's clearly stated aim was to counter the predominance of the 'human-error' view of the cause of industrial accidents:

> Significantly, those few studies that have been published tend to assume that accidents are the result of errors by individual workers or uncontrollable events. No study has examined the way work is organised

> and the adequacy of safety precautions in the Mines and Works Act (MWA) (Leger 1985: v-vi).

Subsequent work done elsewhere has addressed this issue, both directly (Quinlan 1988) and indirectly (Dwyer and Raferty 1991), as well as specifically regarding mining, insofar as taking workers' views of Occupational Health and Safety (OHS) into account is concerned (Gunningham 2008). The matter clearly requires revisiting locally in mining and this is done all too briefly below. For while the focus of this thesis is labour time, no study on mining can ignore the matter of safety, to which changes in working schedules, as we have seen, are intimately linked (Lewis 2000). This raises the question regarding the relationship between safety and time in the context of the underground labour process.

8.5 Working time and safety

In the literature on mining in South Africa, the works of Jean Leger remain foundational texts regarding the health and safety of mine workers, despite the passing of a quarter of a century (1985; 1992). Later work continues this focus (Anonymous 2005). Such is the occluded nature of labour time, however, that both Leger's thorough work and the 'cultures of safety' report (Anonymous 2005) are completely silent on the critical relationship of working time and safety despite work having been done over time elsewhere (see for instance Benson 1998; Johnson & Lipscomb 2006). Michael Quinlan, for instance, indicates that 'Changes to working hours and other working arrangements *may* have profound implications for OHS especially in the long term' (1995:22) (my emphasis). The qualification 'may have' suggests such work was still in its infancy in the mid-1990s. Certainly beyond mining, only a few years ago it was asserted that there are 'comparatively few studies' which examined the impact of long working hours on 'workers' risk for occupational injuries and illnesses' (Dembe *et al* 2005:588).

Unsurprisingly then, locally, no COMRO research, from the early 1960s through to the early 1980s, was ever conducted on the issue. The otherwise comprehensive SIMRAC 'Handbook of Occupational Health Practice in the South African Mining Industry' does not even pose the relationship between time and safety (2001). Recall, however, that it

was only in the early 1990s, when Leger was conducting his studies that working time issues and prescriptive criteria for shift arrangements surfaced as a concern internationally (McCann 2004). While COSATU had taken up the demand for a 40 hour working week as part of its living wage campaign in the 1980s, it took another 15 years before the issue surfaced prominently on the mines and Lewis conducted his SIMRAC study, which he followed up with commentary (Lewis 2000, 2001).[302]

The project consequently started by asking respondents how safe they felt while at work in the mining industry.

8.5.1 The experience of feeling safe

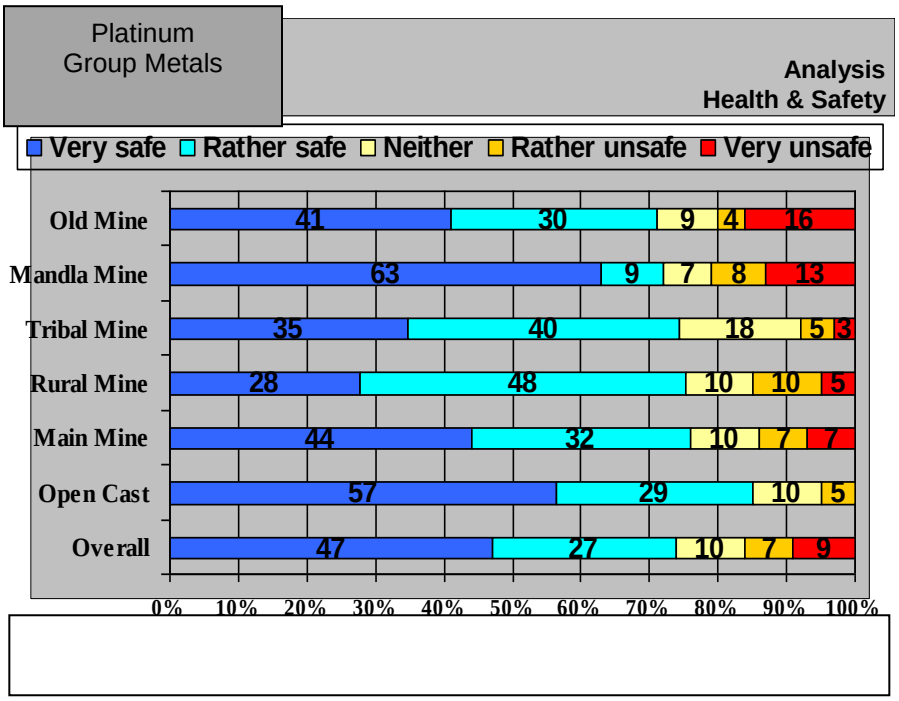
As Peter Lewis was seen to sum up with regard to mining in South Africa, OHS issues emerge as the central focus in the literature when consideration is given to the exploration of working time and shift preferences. More generally, in no other industry beyond mining is effective worker engagement with OHS issues more crucial (Gunningham 2008). Yet, to repeat, specific concern with the labour process and its relation to working time is virtually completely absent from this literature. For while optimal health and safety in the working environment is a hallmark of a good shift system, health and safety measures also serve as an indicator of poor working arrangements generally. Health and safety, in other words, cannot be meaningfully discussed without reference to the labour process. This becomes very clear when workers' concerns around their working conditions and experience of underground mining production are broached in the context of investigating working time arrangements.

In order to understand the relationship between safety performance and working time arrangements, workers and managers were asked how safe *they* felt at work. Surprisingly in the context of underground mining, three quarters (74%) of respondents felt 'very' or 'rather safe' at work, while one in six (16%) felt 'rather' or 'very' unsafe. While

[302] This does not mean that working time was not an issue, there being a working time demand in the Freedom Charter of 1955, which was a 'long-standing demand' of COSATU since 1985 (Adler 2001:vii).

managers were more likely to have felt safe (93%), these sentiments were still felt by very significant proportions of supervisors (78%) and even operators (73%). The most senior company executive responsible for directing operations, the chief operating officer of PGM, took the view that this was *not* a positive finding, considering that, in especially underground mining environments, mine personnel should continually feel somewhat *unsafe*, and would consequently more likely be on their guard in an environment fraught with risk and danger.

The feelings workers expressed about their own sense of personal safety (again and forthwith expressed as percentages) across PGM are shown in the following bar chart.



While the proportions of respondents feeling safe or unsafe at work were fairly similar across the different mines, higher proportions of respondents at Old Mine (16%) and Mandla Mine (13%) expressed that they felt very unsafe at work. These two mines have at least two characteristics in common. Both are aging mines located around a secluded mining community in the immediate vicinity of the shafts. Aging mine infrastructure underground can be very unsettling. At the other end of the scale, only a few respondents (5%) at Open Mechanised Mine (a new mine and the only open-cast operation covered by

the project scope, included for political reasons internal to PGM) felt rather unsafe at work, none feeling very unsafe.

The responses in both focus groups and in-depth interviews were fairly directly related to occupational level, with production workers far more likely to express the view that not enough was being done regarding safety. It was strongly indicated in interviews and focus groups that risk taking underground was fairly widespread. This was generally due to having to improvise when insufficient production materials were available. This often involves illegally going into barricaded old, previously worked *madala*[303] sites and removing timber support packs, for instance. This is not only dangerous, but also wastes time and increases unperformed surplus labour time.

8.6 Production factors impacting on working time

8.6.1 Unavailable labour

Any form of absenteeism at work represents a portion of historically unavailable surplus labour. More generally, absenteeism represents a loss of output, and it is Burawoy again who addressed the issue by beginning to outline the rudiments of a theory of absenteeism focused primarily on the Zambian copper mines (1972b:256-261). Absenteeism, he noted, is variously used as an index of worker commitment, worker indolence or 'labour indiscipline'. It was used in the Soviet Union in the 1920s and 1930s, in Britain during the Second World War and in Zambia after independence as a measure of 'labour indiscipline'. In these three cases the charge against the miners was that they were not pulling their weight in the interest of the greater social good: for socialist reconstruction in the Soviet Union, the war effort in Britain and in fulfilling their central role in the economic development of the newly independent Zambia. This led to concerted efforts to regulate and control the levels of and even attempts to eliminate absenteeism. I have not encountered in the literature any other instances where miners' absenteeism in the regular course of their daily occupational work became a public issue. The attempts the local

[303] Old, i.e. worked-out sites

mining industry has made to control and regulate absenteeism are embedded in internal reports not procured for this study.

One point of contrast and one of concurrence with Burawoy's article is worth noting. Citing Alvin Gouldner's (1964) celebrated study of a gypsum mine, Burawoy notes that underground workers were 'very much more prone to absenteeism than surface workers', but also worked harder and consequently suggests the 'actual relationship between absenteeism on the one hand and production and indolence on the other is by no means clear' (Burawoy 1972b: 259). The next chapter will show that this was not the case on a platinum mining shaft over a unique period of time. What is clear is that absenteeism rated highly in the responses of both workers and managers as a key problem and reason for not meeting production targets. Being absent from work without permission has become something of a sub-culture on South African mines and requires its own dedicated academic study.

What were widely considered as unacceptably high levels of sick leave noted during the course of the qualitative research, suggested the necessity of researching the relationship between current working time arrangements and what in managerial parlance is referred to as 'organisational health performance'. The sick leave system was widely reported to be subject to 'abuse' (a common refrain on any mine shaft) as workers made use of 'sick leave notes' for reasons other than their intended purpose, thereby complicating the general evaluation of health among workers and its assessment by way of existing health and safety measures.

8.6.2 Material shortages

Unperformed surplus value is represented, *inter alia*, by a situation where any worker, whether working voluntarily or under compulsion, at any given moment, actually wants to get the job done and is unable to due to a lack of the necessary materials. In 1969, across 10 of 11 mines surveyed, 'getting enough and proper materials' topped a list of nine problems experienced by production shift bosses (Lawrence 1969:i). The effect of

material shortages on labouring workers was little understood, but readily acknowledged in research conducted in three years later.

> It is unclear how shortages of working materials affect these men to such an extent but the consistency with which it appears would lead one to believe that this matter is one which affects the day-to-day work situation of labourers fairly severely (Mauer 1972:12).

A few years later industry-based research suggested 'the team leader could be given more control over the *organising* of his *materials, equipment and labour*' (White 1976:9, cited in Fone 1985:28) (Fone's emphasis). A full generation later this remains a huge issue in mining. When a significant part of the wage depends on getting the job done to earn a bonus (direct net surplus value-creating labour time) the older generation of workers will do whatever is necessary to achieve this. As we have seen, the current younger generation prefer to stick to the official rules of the mine and leave the working faces when time is up.

Anticipating the next set of results, it is significant that the mines with the highest rating regarding material shortages responsible for impeding meeting targets (Old Mine (48%) and Mandla Mine (47%)) registered the highest degree of feeling either 'rather' or 'very unsafe' at work (Old Mine (20%) and Mandla Mine (21%), and registered safety highest as a problem (Mandla Mine (40%) and Old Mine (34%). By the same token, those with smallest materials problems (Open Mechanised Mine (19%), Rural Mine (20%) and Main Mine (27%)) registered the smallest number of informants feeling very or rather unsafe (Open Mechanised Mine (15%), Main Mine (14%) and Rural Mine (15%)). This strong statistical relationship between shortages in the supply of materials and the experience of feeling safe at work points to organisational and hence structural factors, belying the focus of virtually all individualistic, behavioural-based safety programmes continually rolled out in the mining industry, generally borrowed from elsewhere. While these programmes conducted during training are generally very well received by workers, they seldom appear to have the desired impact.

The results for Tribal Mine, with a high score for materials as a problem (40%) and the lowest score for feeling unsafe (8%), are not necessarily a counter-indication. Tribal Mine interestingly rated safety as a problem for productivity (15%) even lower than the open-cast operation of Open Mechanised Mine (19%). Apart from the incline shaft at this only recently established solid-state production mine, this apparent anomaly can be explained by an unusually educated echelon of mineworkers, well versed in legislation granting workers the right not to work under conditions they deemed to be dangerous. The mine boasts the youngest, most educated miners in Africa. Rock drill operators underground, many of whom were matriculants, were found to be studying for personnel diplomas and other college-type qualifications. When such workers did not have materials, they would simply walk out of the mine, much to the chagrin of their supervisors, generally older men, separated from the mineworkers by both age, race and educational qualification, many having entered the industry years before *sans* a matriculation certificate and very much still bearers of the old occupational culture of *planisa* and improvisation, long entrenched in pre-democratic, racialised work regimes. We may note that these very largely young men, who stood in sharp contrast to the older were found to feel a strong ownership claim via a royalty agreement that underpins this phenomenon. With young workers only too well aware of their recently achieved rights in a democratic South Africa, charges of racism were openly expressed at this mine.

8.6.3 Targets and productivity

If in Marxist value-theoretic terms the measure of value, socially necessary labour time, is an imponderable shifting average, then the measurement of labour productivity for capital is fraught with its own conundrums. In mining in 1987, a 'normal' measure of labour productivity was the tons of ore produced by a man per annum (Frost 1987:6). Twenty or so years later, when I was on the mines, miners used the colloquial term of 'centares' as the general measure of productivity, by which was meant the number of tons of ore produced per man per month. The rudimentary character of this measure was well known, for if stope widths (the 'height' between the footwall and the roof hanging) are not kept to a minimum, miners would charge their fellow miners with mining rock not gold, as the

grams of gold per ton of rock would be needlessly lower than necessary. The next chapter will introduce yet other measures of labour productivity and output in mining contexts.

Given a particular set of technologies or stage in the development of the forces of production, labour productivity, however measured or defined, is, within the length of the working day, subject to the ratio between unperformed surplus and net surplus-creating working time. This ratio expresses the difference between time spent at work and the time spent actually working. This was seen as centrally integral to workers' arguments for reducing working hours, as Chapter six argued and Chapter seven showed. As a quantitative duration of labour time it can, moreover, be accurately measured. This makes it an ideal candidate for epistemically robust social science. Daily time-use diaries are consequently increasingly being employed as a research tool, the methodologies of which are keenly debated (Glorieux, Mestdag & Minnen 2008).

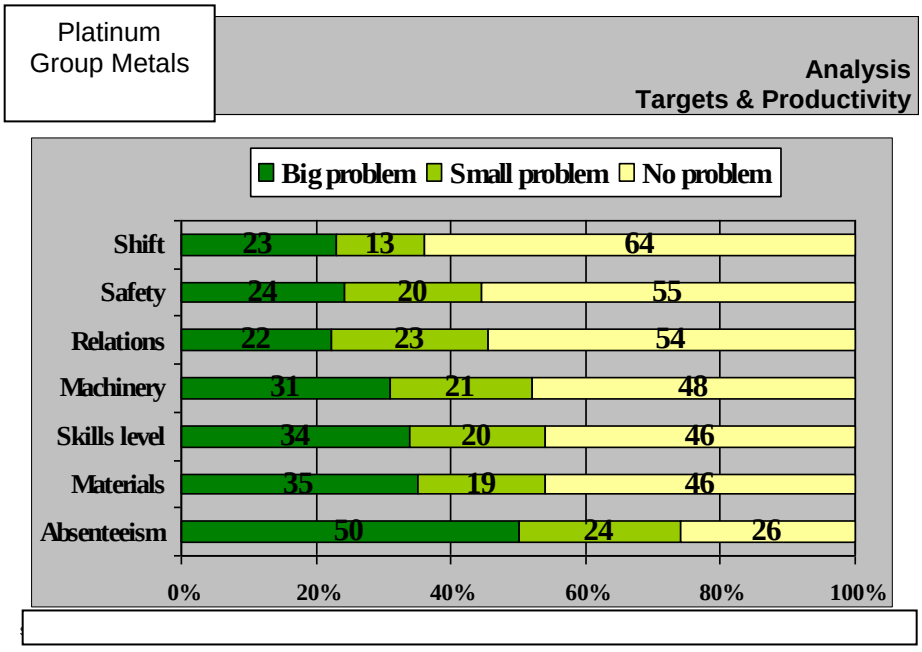
More specifically, what can be measured very accurately are the differences and ratios not just between time spent at work productively (direct and indirect net surplus value-producing labour) and unproductive time spent at work (unperformed surplus labour), but also historically unavailable or non-working (labour) time. Absenteeism is historically unavailable labour time representing a loss of output for the capitalist. Statistically, for both workers and managers, this will be seen to be the single greatest impediment to meeting production goals and targets impacting on 'productivity'.

Operators tend to grumble that they could be enjoying leisure time instead of, for instance, waiting for materials or absentee labour. There is considerable porosity in the working day. This is deemed to drive demands for additional leisure time by virtue of workers' arguments that if things were efficiently run, they could do the same amount of work in less time, and that they remain unnecessarily stuck down the shaft. Further, where workers consider the provision of production consumables a solely managerial responsibility, the situation is exacerbated. Workers noted these constraints to efficient production practises more frequently than concerns about the shift system. The exception to this rule was Rural Mine, where residential communities were closely clustered around

the shaft and whose workers had cohered politically around the demand for a five day working week, and preferred more leisure time even above increased wages when it came to a choice between the two.

The complexity of these matters aside, the issue of targets and productivity was initiated by firstly establishing the degree of awareness among respondents, who were all asked whether or not they had targets that they needed to meet on a daily, weekly or monthly basis. Two thirds (65%) of all respondents stated that they did have such targets to meet in their job. Managers (90%) were more likely to point to such targets than supervisors (72%) and operators (63%).

The respondents who stated they had targets to meet were then asked about a range of factors that could affect whether or not these targets were met. Respondents were asked on a Likert scale whether the following factors were a 'big' problem, a 'small' problem or 'not a problem' in meeting their targets: the Shift System; Safety Conditions; Relations between supervisors and workers; Machinery and Equipment; Levels of Skill; Availability of Materials, and the Rate of absenteeism among workers.



Focusing on the factors thought to be a big problem in meeting targets, half (50%) of all respondents who had targets to meet thought that absenteeism was a major problem. Approximately a third of respondents pointed to availability of materials (35%), skills level of workers (34%) and machinery and equipment (31%) as big problems in meeting targets. At the other end of the scale, a quarter of respondents cited safety conditions (24%), shift arrangements (23%) or poor relations between supervisors and workers (22%) as big problems in meeting their targets. Absenteeism, availability of materials and the skills level of workers were the three main problems cited by managers, supervisors and operators. The only difference was that higher proportions of managers (61%) and supervisors (63%) stated that absenteeism was a 'big problem' than did operators (48%). This difference is dramatically more marked in the case of Old Mine. Further evidence shows the shortage of materials was highlighted by operators, while managers attributed absenteeism as the primary cause of production constraints.

Differences across the mines in the PGM group surveyed were found when the proportions of respondents who viewed each factor as a big problem in meeting targets are examined:

Platinum Group Metals

Analysis
Factors Affecting Targets & Productivity

Factor	Mandla Mine	Tribal Mine	Rural Mine	OMM	Main Mine	Old Mine
Absenteeism	65	52	47	47	48	40
Materials	47	40	20	19	27	48
Skills level	49	28	29	47	33	27
Machinery	48	28	13	13	24	40
Relations	36	14	21	44	17	26
Safety	40	15	25	19	18	34
Shift	39	5	56	20	15	25

Release 0.1

At most of the mine shafts, all shortages of labour, collapsed under the rubric of absenteeism, were the biggest cited problem in meeting targets, especially at Mandla Mine (65%) and Tribal Mine (52%). In contrast, more than half (56%) of respondents at Rural Mine thought that their shift arrangement was the biggest problem, while at Tribal Mine this was not a problem due to the incline shaft, as workers simply walked out to surface if they felt aggrieved over an issue. At Old Mine and Mandla Mine nearly half (48% and 47% respectively) of all respondents cited the availability of materials as a big problem in meeting targets.

Despite these varying sets of views, there was an exceptionally strong sentiment among production workers and supervisors that targets *could* be met. The preparedness to achieve their target 'call' was very strong despite the obstacles. Given that both underground workers and supervisors depend heavily on production bonuses, this is not surprising as meeting targets is the not-so-hidden driving force of the 'production of consent' (Burawoy 1979).

In face-to-face interviews, labour shortages, inadequate face availability and availability of materials constantly arose as the three major factors impeding safe and efficient production. All three of these factors erode the time available to spend actually working. These quantitative findings, that wide variations exist regarding these immediate production constraints, strongly confirmed the need for site-specific solutions at mine and shaft level, as recommended in the international literature. Overall, the survey results confirmed a clear appreciation of the factors impeding the meeting of production targets, as expressed in face-to-face interactions and conversations between researchers and mine workers, and well-documented in the recent literature (Webster *et al* 1999, 2000, 2001; Phakathi 2001).

8.7 Preferences for working time options

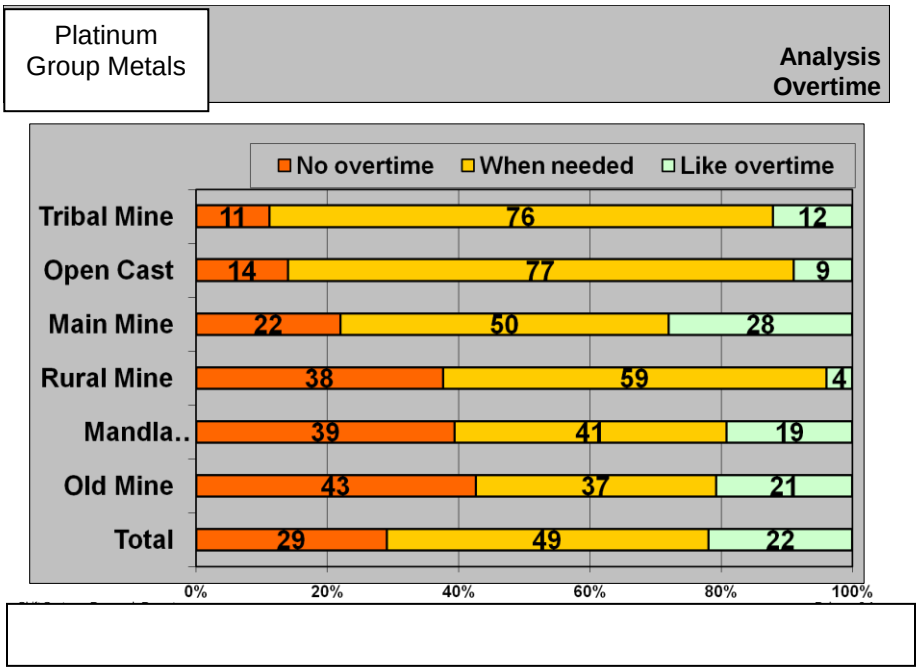
8.7.1 Overtime

Overtime is an aspect of socially average necessary labour, represents an aspect of the historical and moral (or social) component of labour time and relates to struggles over social standards of living. It also lengthens the working day and reduces historically unavailable surplus labour, albeit at a cost. Mineworkers have claimed they were often forced to work overtime (Ulicki 1999). Even more so than time itself, it has been argued that overtime has been consciously socially constructed (and even manipulated) since its formulation in legislation in 1938 and is 'still-contested' and has 'multiple shifting meanings' (Martorana & Hirsch 2001:165-6). Working overtime hours is an important factor when considering working shift preferences, as some shift configurations attract overtime more or less strongly than others. Overtime, moreover, can be an indicator of inefficiencies in production and the need for more time to complete a job. Perceptions of the lack of efficient work processes were shown to relate directly to worker frustrations and expressions of fatigue, which in turn drove demand for additional leisure time and the reduction of working hours.

Respondents were asked how many days of overtime they had worked in the month prior to being interviewed. While three fifths (60%) of all respondents had not worked any overtime, a third (33%) had worked between one and five days' overtime, with the remaining 7% having done six or more days.

All respondents in the quantitative survey were then asked about their views on working overtime. Across the total sample, three tenths (29%) of respondents stated that they did not want to work any overtime. At the other end of the scale, almost a quarter (22%) said that they liked working overtime, while the remaining half (49%) of the sample were pragmatic and said that working overtime was fine when necessary.

Operators (23%) and supervisors (20%) were more likely to want to work overtime than managers (6%). The differences across the mines were fairly significant:



Far higher proportions of respondents at Old Mine (43%), Mandla Mine (39%) and Rural Mine (38%) were against working any overtime at all when compared with respondents at Main Mine (22%), OCM (14%) and Tribal Mine (11%).

The qualitative findings regarding overtime are challenged in the light of these results. The sense gained by qualitative researchers was that employees wanted to work more overtime than the survey results revealed. The suggestion that Saturday could be overtime work and that there would be sufficient takers was supported on a number of occasions by the three main occupational groupings of respondents: operators, supervisors and managers.

While Rural Mine had the smallest percentage (4%) liking overtime, respondents appeared to have welcomed being paid directly in cash for unstructured overtime shifts, generally instituted at short notice over the weekend on the 'off' Saturdays, to meet production targets. At Rural Mine this had recently been discontinued due to the high exchange rates (which increases the costs of mining locally, putting additional pressure on a traditionally high-cost industry) and 'logistical problems', i.e. the hijacking of cash-in-transit vehicles travelling on rural roads out of the way of the nearest city.

The imperative to cut costs had led managers on the other hand to attempt to contain overtime as far as possible. Senior managers were more inclined to stress overtime as having serious cost implications. High levels of overtime were certainly considered economically unsustainable and were seen as occurring as a result of poor planning. A number of production workers, unsurprisingly, did not note any constraints to working overtime, these workers simply wishing to earn as much as they could.

Overall, the preparedness across the group to work overtime when required (49%), rising to 76% at Tribal Mine and 77% at Open Cast Mine, is greater than overtime actually worked (40%). The general response to working overtime suggests the obvious need for additional remuneration, or, in value-theoretic terms, the desire to increase the value of their labour power or wages.

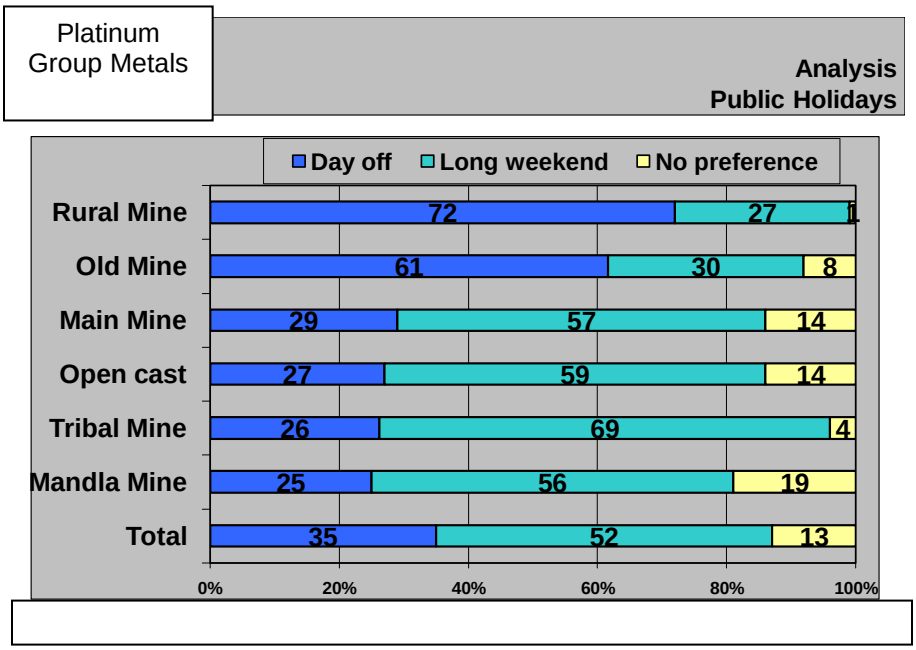
8.7.2 Public holidays

Public holidays represent historically unavailable surplus labour time. The issue of working on public holidays has particular implications for modifications to existing working shift arrangements. Within the industry it has long been a standard practice to 'work in' either a public holiday or Saturday to consolidate a longer 'off' period, generally a three day weekend. The intention was to test for a general preparedness to institutionalise this fairly common practice, and levels of acceptance of a modification, as opposed to a fundamental change, to the current shift arrangements.

Respondents in the quantitative survey were asked whether or not they had worked on a public holiday in the year prior to being interviewed. Almost two thirds (64%) claimed that they had worked on a public holiday. In direct relation to physical work intensity, operators were more likely (37%) than supervisors (27%) or managers (10%) to want the day off. Simply being able to take a one day break was a higher value in over a third of the production workers than having a long weekend. Differences were again significant across the different mines. Where workers lived within the community close to the mine far afield from any other town, over two thirds of respondents across occupational levels wanted the day off: this was the case at Rural and Old Mines. Long weekends, where

people could get away or travel, were preferred elsewhere. Relatively few respondents expressed no preference.

At the company-union-staff association combined report-back sessions to their own leadership groups, these differences across the different mines attracted a good deal of discussion and debate, as managers and worker representatives, presented with research data relating to their own familiar situations, began to consider practical options of how to satisfy their constituents. Contestation even over the two main options that divided trade unionists and managers appeared to dissolve in the light of the raw data presented to them. The effect of bringing in social science in this instance was significant. There was a genuine interest in the complex picture resulting from the research. Intense debate was generated as to the reasons for the different results from the different mine sites surveyed. The different options available to the previously conflicting parties provided more room for negotiation than the two options around which management and the unions had cohered - either a modification of the six day week or the five day week which had polarized relationships at PGM. On the one hand, however, the negotiations became more democratic. On the other hand, the 'contradictions' in the struggle between these representatives of capital and labour were eased - about which much could be said when social science is brought into conflictual industrial situations.



Nonetheless, while the majority of respondents at Tribal Mine (69%), Open Cast Mine (59%), Main Mine (57%) and Mandla Mine (56%) preferred to work the public holiday and have a long weekend, this was not the case at the Rural and Old Mines, where 72% and 61% of respondents, respectively, preferred to have the day off. This suggested fairly clear-cut modifications to the current shift arrangements. Rural Mine and Old Mine are both enclosed, far-flung mining communities where everyone who works there lives on the doorstep of the shaft. These largely homogenous (though racially divided) communities clearly preferred regular working and leisure times, with no need to travel home and no need for long weekends to do so.

In focus groups and interviews, a largely pragmatic attitude prevailed regarding public holidays, thereby confirming the statistical evidence. A few outright refusals to work on these days were noted, mainly for religious reasons. There was a concern expressed that underground supervisors were absent during public holidays when the day was being worked and that this maintained occupational divisions between workers and managers in the organisational culture at PGM. While 'voluntary' work on a public holiday was advanced by operators as an option, managers generally viewed this as organisationally problematic. The significant differences in respondents' preferences at different mines again pointed to the principle of site-specific solutions.

8.7.3 Shifts

As noted, the main objective of the quantitative survey was to explore the preferences of all respondents around various working shift arrangements. Here preferences were sought for different shift configurations, with the number of hours worked a week, as per long-standing traditions, remaining the same. Preferences for the following different modifications to the ESF were solicited: working every Saturday with extended annual leave; working three Saturdays in a row with a long weekend in the fourth week; preferences across four distinct options; and willingness to work different hours across different shift options.

8.7.3.1 Working every Saturday

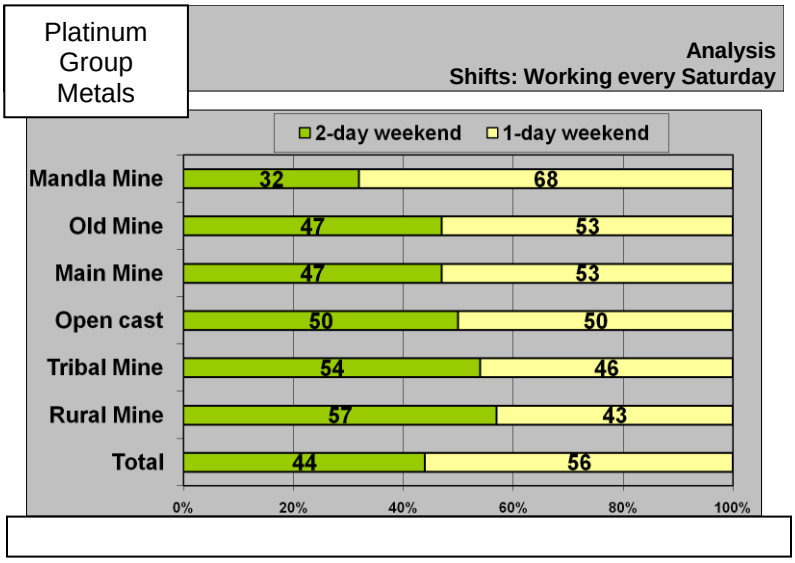
At least since the Franzsen Commission in 1977/8, Saturday has been treated as a half day and a cleaning shift on many mines. The intensity of work being performed underground can easily be read off from the amount of electrical power being drawn down for the compressors serving the drills. Readings showed that on Saturdays most drills were not operating in the stopes, indicating fewer blasts for the (unofficial) half or three quarter day's work. Managers regularly only put in an appearance on surface, line managers often do not go underground and workers are left to fend for themselves, often decrying the lack of authority to appeal to in the case of a range of incidents perennially cropping up in a day's work. The issue of working on Saturday, the length of the shift, and generally lower attendance on Saturday, have long been bones of contention within the industry.

Respondents in the quantitative survey were consequently told to imagine the following two friends talking about working on weekends:

The first one says: "I would prefer to have two-day weekends all the time and then shorter leave at the end of the year."
The second says: "No way - I prefer one-day weekends and then longer leave at the end of the year."

Respondents were asked which of these two options they preferred. The total sample was fairly evenly split, with 44% opting for two-day weekends with short leave, while 56% preferred one-day weekends with longer leave. The majority of managers (60%) and supervisors (53%) preferred the two-day weekend option as compared with 43% of operators.

The findings at the different mines, noted in percentages, proved instructive.



Respondents at Open Cast Mine were fairly evenly split on the preferred option, with few significant variations. Just over half of respondents at Main Mine (53%) and Old Mine (53%) preferred a one-day weekend with longer leave, as did more than two thirds (68%) of respondents at Mandla Mine. In contrast, the majority of respondents at Tribal Mine (54%) and Rural Mine (57%) preferred the two-day weekend option with shorter leave.

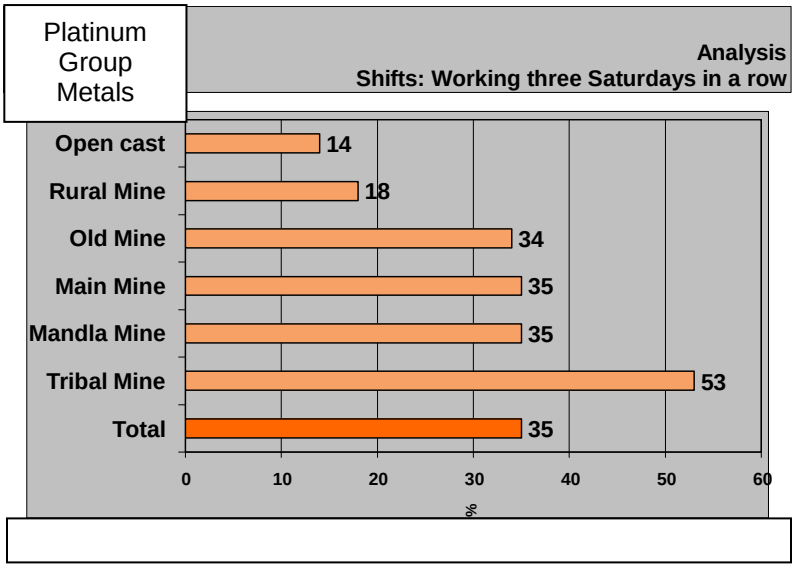
This set of findings presents a picture of the complexity of the issue of working time arrangements as a whole. Whereas the overriding pattern in the greater proportion of the sets of findings reveals significant differences, suggesting reflections of specific local conditions, the findings in this instance do not mirror this pattern. Mandla Mine, however, displayed the greatest willingness to change to an unfamiliar working pattern, i.e. longer leave at a single stretch within the month.

The assumption was that the number of shifts remains the same. The shifts are instead rearranged. This assumption would fall away were alternatives considered in which either less or more shifts were required. The same applies to the further assumption that the number of personnel remains the same in this instance and that shift arrangements would need to alter as a result of a greater or smaller number of workers.

8.7.3.2 Working three Saturdays in a row

Respondents in the quantitative survey were told to imagine that they had to work three Saturdays in row, and then have a three-day weekend in the fourth week. They were asked if this arrangement was better than their current ESF working shift arrangement. Workers were asked to choose, in other words, between a 6,1; 6,1; 6,1; 4,3 and their traditional 6,1; 5,2; 6,1; 5,2 shift configuration.

Just over a third (35%) of respondents felt that working three Saturdays in a row with a long weekend in the fourth week would be better than their current ESF arrangement. Put differently, nearly two thirds of workers were indifferent to the two options. The differences across operators (36%), supervisors (28%) and managers (32%) were not significant. However, there were significant differences across the different mines:



While very few respondents at Open Cast Mine (14%) and Rural Mine (18%) felt that working three Saturdays in a row was better than the ESF arrangement, more than half (53%) of respondents from Tribal Mine favoured such a shift arrangement.

In this instance, the stated preferences clearly provided a guide as to possible alternatives that could be considered in conjunction with other factors. Taking this data as a base line,

alternatives considered at Open Cast or Rural Mine, for instance, are unlikely to be the same as those considered at Tribal Mine. Worker representatives and managers had difficult decisions to make.

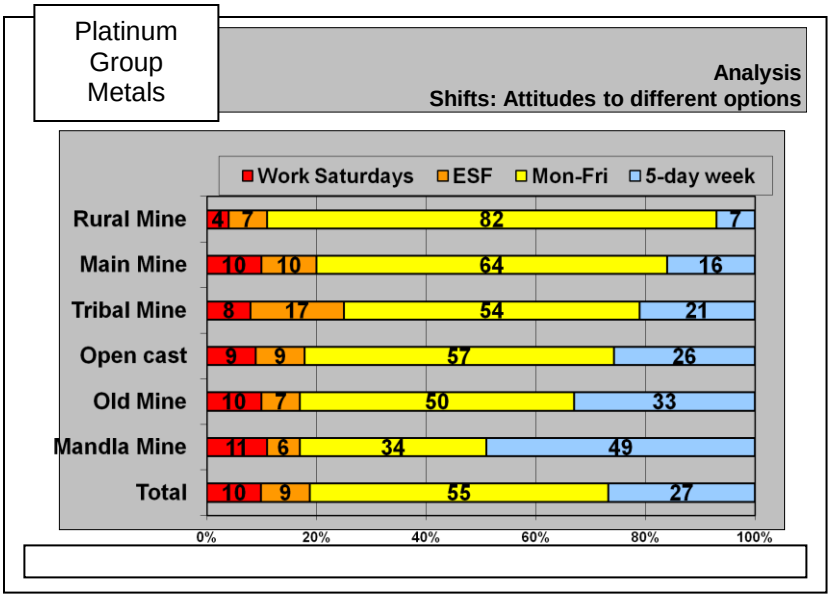
8.7.4 Attitudes to different options

Different shift arrangements are preferred for different reasons: these may include time to spend with one's family, more social time, or more money, the reasons potentially proliferating in manifold directions. When it came to the clear-cut option, results were considerably clearer than the responses to the modifications of the ESF that have been observed thus far. All respondents were asked to listen to the following four friends talking about different shift arrangements:

The first one says: "I would prefer to work every Saturday and then take a month off at some time during the year". The second says: "Working every second Saturday works for me as having every weekend off is not that important." The third says: "I do not want to work on weekends at all." The fourth says: "I am happy to work five days a week on any days of the week."

Respondents were asked which one of these four friends best described how they felt about different shift arrangements. Only one in 10 (10%) respondents opted for working every Saturday, with a very similarly small proportion (9%) happiest with their current ESF system. More than half (55%) of respondents stated their preference for a Monday to Friday week, while over a quarter (27%) were prepared to work a variable hours', five days a week shift schedule on any days of the week.

While the differences between supervisors and operators were insignificant and their distribution fairly closely resembled that of all employees, managers were, interestingly and somewhat to the chagrin of more senior managers, far more likely to want a Monday to Friday week (69%). Differences across the mines were considerably more pronounced.



The very small proportion of respondents preferring to work ESF or every Saturday, from 4 to 11%, was fairly constant across PGM. More respondents from Tribal Mine (25%) were in favour of one of those options compared to very few respondents (11%) at Rural Mine, where a very strong preference for the Monday to Friday working week (82%) was expressed and where workers had dug in their heels over the issue.

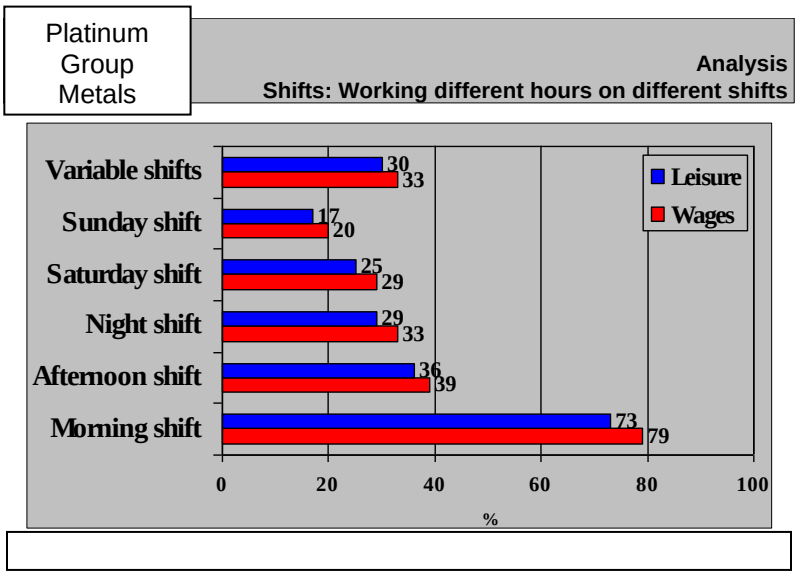
The lack of support for the current shift arrangement strongly confirms the reason the ESF had come up for review, thereby aligning with the historic international trend that worker sentiments are largely responsible for raising the issue.

What is not surprising is that the largest proportion of respondents (barring Mandla Mine, for which no adequate explanation ever emerged) opted for the more conventional Monday to Friday week. What is surprising is that the proportion of respondents voting for a regular Monday to Friday work week as a preference was not higher than it was, given the historical demand for one. At Mandla Mine, moreover, almost half (49%) of respondents chose a five-day week on any days of the week.

The very strong preference expressed across the mines for a five day week, however, whether Monday to Friday or on any days of the week, reflects the historic demand for reduced but regular working hours.

8.7.5 Working different hours on different shifts

Survey respondents were asked about their willingness to work *different hours* if they were either offered higher wages *or* more leisure time, if this meant that they had to work: a morning shift, an afternoon shift, a night shift, a Saturday shift, a Sunday shift or some form of variable working time arrangement.



The first point to be made is that the differences between responses on wages or leisure were not significant. By implication, higher wages or more leisure time are both appropriate incentives for changing current working time arrangements.

As could be expected, the proportion of respondents willing to work on different shifts decreases as one moves from morning, to afternoon, to night and week-end Saturday and Sunday shifts. However, there were still significant proportions of respondents willing to work such shifts, with important implications for any alternative working shift arrangements. Noteworthy, too, is that a third of respondents were willing to work variable shifts for higher wages (33%) or leisure time (30%). Read differently, in both

instances, around seventy percent of workers across all occupations (including managers working on the surface) were not prepared to do so.

The responses to the two options (higher wages or more leisure time) show the proportion of respondents willing to work different hours and shifts.

Platinum Group Metals

Analysis
Shifts: Willingness to work different hours & shifts

Shift	Mandla Mine	Tribal Mine	Rural Mine	OCM	Main Mine	Old Mine
Morning	79	98	82	86	84	81
Afternoon	44	64	51	41	43	35
Night	42	64	37	27	32	30
Saturday	39	52	23	29	28	25
Sunday	25	29	16	23	21	23
Variable	29	58	35	62	35	42

The findings across the different mines again reflect significant proportions of respondents that were willing to work different hours in different shifts. This was particularly the case at Tribal Mine, where the majority of respondents were willing to work the different proposed shifts, except the Sunday shift. Willingness to work variable shifts was also high at Open Cast Mine (62%). In the case of this mine it is not surprising, as the vast majority of mine personnel in this open-cast operation work continuous shifts and this temporal working time tradition is established.

8.7.6 Summary

In discussions with the 'high level team' responsible for thrashing out a new shift system and answerable to their constituencies, these findings, taken as a whole, expressed much of the substance of the robust debates and indeed contestation that had revolved around a range of factors which were cited in support of particular working

time arrangements. The relation between health and safety performance, materials supply and working time is a particular case in point. Respondents in general also believed that current working time arrangements were adversely affecting their health and safety. They further believed that an alternative work time arrangement could have beneficial effects. In particular, these results imply that workers thought that such changes could result in a reduction of absenteeism and fatigue-induced incidents.

Respondents quite significantly rated other factors impeding targets more highly than their working time arrangements, yet displayed a keen appreciation for what they viewed as constraints to safe and productive work. This was most noticeable in the strong assertions from operators that being given the correct materials at the right time would mean a reduction in working time without any loss of production.

Respondents fully appreciated the importance of meeting targets, as success translates directly into additional remuneration via the bonus system. The levels of preparedness to do so, and particularly operators' confidence in their ability to do so, was high, as evidenced by this having been achieved at PGM the year before in 2003.

The view that adequate supply of materials is solely a managerial prerogative is equally widespread, the instances of failure being met with frustration as men were keen to get on with their jobs. In the absence of materials, men at Tribal Mine would simply walk off the job, leaving stope faces not blasted. This cuts against what had a few years before been identified as a deeply entrenched aspect of the occupational culture (see Webster *et al* 1999) of underground mining men never to leave a stope-face that has not been drilled and charged up ready for blasting: the new generation of mineworkers, as we saw Phakathi (2011) to have shown, challenging research (in which we were both involved) conducted a decade before. The extent to which, however, the lack of production materials is often advanced as an excuse for not having blasted is legendary in mining.

The degree of pragmatism regarding overtime and working public holidays was pronounced. With the exception of the issue regarding working every Saturday for longer leave, where responses were evenly split, the differences in preferences across the mines were consistently marked. This pattern is strongly suggestive of site-specific solutions accommodating local conditions across a range of factors such as demographics, mine infrastructural capacity, distance from home and the stated preferences emerging from them.

While *any* five-day work week arrangement attracted an exceptionally high preference among those surveyed, the current ESF system hardly found favour overall. Support for modifications to the current system showed significant variation, with the option of working every Saturday in exchange for longer leave attracting attention across the population surveyed.

8.8 Conclusion

The import of all of the various shift options put to workers, barring that of the five day week, essentially amounted to the goal of mopping up historically unavailable surplus labour time - potential, but unused labour time: Public holidays, Saturdays (when only half of a mine's complement is on shift), and Sundays (when only very few are at work and tranches of time are written off to absenteeism) are all cases in point. What this chapter has shown is that not only workers and supervisors, but also managers employed at PGM, expressed strong preferences for the regular, reduced working hour regime of the Monday to Friday working week, holding time as a value very close to wages and remuneration. That managers also preferred a five day week is not surprising in the light of research subsequently conducted on the platinum mines in the North West Province, where managers were shown to suffer from 'burnout', 'exhaustion' and 'emotional exhaustion', 'cynicism,' 'distress', 'reduced effectiveness' 'reduced professional efficacy' and 'dysfunctional attitudes and behaviours at work' (Rothman & Joubert 2007: 49,50).

While resisting the five day week option, management were unable, due to the strength of workers' demands around the five day week, to table their preference for continuous shift

schedules openly. The historical experience of changing shift schedules and working time, up until 2003, had, in addition, not resulted in unambiguous outcomes regarding productivity and worker health and safety underground, the necessity of maintaining the former representing management's fixed position. At Old Mine, as the previous chapter showed, the five day work week experiment was highly contested and precluded any clear results regarding production, though safety statistics showed a significant improvement.

As a result, the company-wide review at PGM subsequently conducted and reported in this chapter focused on modifications to the ESF. With a single exception, where the community of Rural Mine as a whole were set on a five day week, including those at managerial level (despite the company's unstated position that this was not to be an option) the shift system or working time arrangement was never cited as the main impediment to either achieving production targets or worker safety. Other constraints, preventing efficient production results, notably shortages of labour, materials and equipment, featured considerably more prominently. This raises the question whether satisfying workers' production demands would not 'create' additional time that could be allocated to leisure.

Workers were, in value-theoretic terms, engaged in a struggle over their social standards of living (more leisure time in this instance) and were explicitly identifying production constraints that unnecessarily, in their view, lengthened the working week. Were these demands to be met, could workers in fact maintain or improve existing production levels if five and a half shifts were reduced to five shifts, but, crucially, do so safely? It is to this question, investigated in one specific instance, that the final chapter of this thesis turns.

8.8.1 Annexure I

The table below eliminated schedules not complying with a set of rudimentary criteria and local BCEA legislation. The criteria were: five to seven maximum consecutive working days, the elimination of quickly rotating shift systems, and every system to have some weekends with two successive days off.

Shift system	Production	Brief Description	Hours	Job Creation	Compliance status
11 shift fortnight *Standard*	Maintain	Every second Saturday off, generally with unspecified voluntary or weekend overtime.	48 + hours a week	No change to existing manning levels	Acceptable; Not strictly BCEA compliant; requires averaging of hours agreements
7 day mine and 5 day man week *Fulco*	Increase	Continuous mining operation with rostered or staggered five day man week.	45 hour week	Increase by variable amounts depending on crew efficiencies	Acceptable
7-1 ,7-1, 7-5 *Fulco*	Increase	Seven shifts on and one day off occurring twice before a 3rd set of seven shifts with a 5 day break once a month.		Increase by approx 25%:requires calculation	Acceptable
6 x 4 *Fulco*	Increase	Six 10 ½ hour shifts and 4 days rostered days off. 44hr 37 minutes a week over four month cycle.		Increase by approx 25%: requires calculation	Acceptable Not BCEA compliant
6 x 2 *Fulco*	Increase	6 shifts on and 2 shifts off.		Increase by approx 25%	Acceptable
6 x 1 - *fulco*	Increase	Six shifts on and one shift off.	52,2 hour week	Increase by approx 25%	Acceptable
4 x 4 *Fulco*	Increase	4 x 12 hour shifts and 4 days off; night and day shift alternate.	11 hours with 9 hours at the face	Increase by approx 25%	Acceptable
5 Day Mon – Fri mine and man week – *Standard system*	Increased in one instance, decrease in other	5 x 9 ¼ hour shifts in the week, 46 hour working week or 5 x 9 ½ hour plus ½ hour travel	Either 47,5 or 50 hour week	Estimated 16% increase of 70% U/G labour to maintain production	Acceptable Not strictly BCEA compliant in one instance cited

9 Making up lost labour-time

9.1 Restoring socially necessary labour time

The previous chapter intimated how, in 2003, across a leading platinum corporate miner, senior worker leadership representatives, in their struggle to change an established work time regime under pressure from their members, demonstrated a clear understanding of the range of complex issues changing working time arrangements throws up. In doing so they remained constrained by the logic of capital accumulation. For even where potentially progressive social and economic developments occurred, improved safety for instance, the requirements of profitability took preference. In this context under capitalism and subject to its hegemonic dictates, they accepted, as most trade unionism does, the *realpolitik* of the interdependence of capital and labour.[304] In short, the workers' organisations' representatives operated within the 'art of the possible' of profitable mining.

The pragmatic attitudes of the combined trade union leaderships and the willingness of virtually all workers to respond to questions about their work time preferences, however, was insufficiently deep to prevent strike action over a work time issue on one of PGM's shafts the following year. Collaboration between capital and labour broke down after a group of just over 450 rock drill machine operators, on a mine comprising two shafts and a workforce of 2 650, which I will refer to as 'The Shaft', went out on three non-sanctioned strikes, illegal in terms of still current legislation. The final strike, preceded by a strictly disciplined eight-hour work-to-rule regime underground, was triggered by annual leave not having been granted, in a few cases, for up to two years, harking back to

[304] Lebowitz, in making his argument regarding Marx's missing discussion on wage labour, couches this interdependence in terms of the unity of opposites; wage labour and the production processes of capital are opposites and exclude each other, but '*are also necessary to each other*' (1992:58) (his emphasis).

the labour-time regime of Mozambican miners nearly a century before. The patent case of mismanagement was, however, merely symptomatic of long-standing and deeper underlying issues that emerged as senior management at PGM required the winning back of the equivalent of the seven shifts of labour time lost due to the third and longest strike, in late November 2004.

Accounting for what subsequently happened has the centrality of labour time expenditure under mining production conditions as its focus. The centrality of labour time is shown by analysing, on the basis of actual participation and empirical evidence, a specific series of events, in their immediate and historical context. The job at hand here is to understand these events through the prism of labour time expenditure. The issue of the lost labour time was expressed and consciously understood (and acted upon) as lost wages and lost wage-rates. This assumed the key focus in a difficult moment in the life of a mining shaft and the people who work there. The events illustrate how matters relating to labour time encompass an extraordinarily wide range of human interactions focused around the organisation of production.

Regarding social relations, the very active human resources (HR) manager on The Shaft became central to production, as opposed to playing the general subsidiary role of organising the acquisition and distribution of labour and satisfying its personnel issues as a condition for productive activity. Once their struggles had catapulted them into the boardroom, worker militants discovered the intricacies the management of large and complex industrial concerns requires. Trade unionists began to appreciate the extent of the technical expertise of supervisors, tasked with the organisation and co-ordination of large numbers of men - and only very recently, some women (see Ralushai 2003 and Benya 2009) - and machinery in a hostile geological underground environment. Most supervisors baulked at the prospect of ordinary workers seemingly assuming a disproportionate degree of control over the immediate production process, especially as many were of the view that the mass dismissal of the machine operators should have been permanent and that senior management had succumbed to black workers' demands. Long-serving senior corporate managers and directors kept their traditional distance from the renewed stirrings

of the troublesome machine operator group, over whom they had long exercised a precarious degree of control. The machine operators, isolated from all other groupings on the mine, intensified their efforts of drilling and blasting, not, however, without a keen interest as to whether their additional collective exertions were sufficient to win back the time lost in the strike. The general workforce, having collectively refused to support the striking machine operators (for reasons which will become clear), remained an ambiguous 'silent majority', and stoically hauled out and trammed the additional ore as per usual.

The intention here is to examine the organisational process aimed at winning back the labour time lost as a result of the final machine operators' strike. This required a qualitative shift in the intensity of the expenditure of an identifiable mass of labour time on the part of the workers themselves. In short, workers were compelled to work with above-average skill in order to win back their lost wage rates. In other words, workers were compelled to increase the value of their collective, social labour, thereby contributing, in the overall scheme of things, to the reduction or rather the restoration of socially necessary labour-time. Contradictorily, however, in order to work harder and increase the productiveness of their labour power, workers had to exercise greater control over the labour process, if only to push harder for their own, generally ignored, *production demands*, to be met.

Labour time, *qua* concept, construed purely quantitatively[305] as the measure of value, cannot account for this qualitative shift in the collective expenditure of the machine operators' abstract labour. The lost labour time would be made up by changing the relation between necessary and surplus labour time, or, in other words, socially necessary labour time would have to be decreased. Workers would have to create a surplus over and above what was socially necessary to be distributed as profits for the company, bonuses for the supervisors and cover the costs of their own reproduction. But in order to do this, they had, as just noted, to exert a greater degree of control over the labour process. This

[305] It has been argued that the 'linear-quantitative thesis' way of reckoning time has dominated industrial sociology, as well as Marxian theory, and is in need of qualification, in particular by way of integrating the qualitative dimension of time (Blyton, Hassard, Hill & Starkey 1989).

implicates social relations in production, particularly between workers and supervisors. Workers would, firstly, have to desist from their struggle to reduce working hours to eight hours a day 'bank to bank', which they were doing by closing off their drills 'early' - in other words precisely eight hours after they entered the shaft - and go back to working the 'regular' nine hours and 20 minutes from 'bank to bank'. The machine operators had not been refusing to work, but were rather refusing to work the generally accepted pattern of 96 hours averaged over two weeks as per the Eleven Shift Fortnight (ESF). By reverting to the stipulated hours of the ESF, surplus value would thereby increase absolutely, resulting from the 'restored' length of the working day. The first task was to restore, in other words, the historical social relations of production - which were disrupted by their actions, and which had 'sprung up' through tradition and class struggle (Marx 1977:477).

In addition, on the basis of absolute surplus value extraction, 'the groundwork of the capitalist system', the machine operators would have to intensify the power of their labour, or, in other words, increase surplus value via non-mechanised means (Marx 1977:477). Workers would have to do with less time to meet the equivalent of their wages. This they would have to do under conditions of their already cut wage-rates, a post-strike disciplinary measure that drastically decreased the value of their labour power. In this instance, as will be seen, relations in production would be forced to change, not through the introduction of new machine technologies, but rather by having to ensure a range of conditions to enhance the intensity of workers' collective labour power. The effect would ripple out, impinging on racialised attitudes to class relations beyond the electronically controlled turnstiles and gates of the mine.

As previously argued, socially necessary labour time depends not only on the 'conditions of production' - comprising both material-technical and organisational features - but also on the 'ability and intensity' of labour (see Rubin 1972:173ff). In following the dictates of capital, the traditional managerial prerogative of continually revolutionising the former impacts on the latter 'subjective' factors. Where workers, in this instance, assumed a measure of collective control over the latter, this disturbed age-old traditional hierarchies, still structured very largely in terms of race, regarding intra-class relations *in* production

and in terms of class proper regarding relations *of* and beyond production. Regarding race, for instance, the situation on the mines was recently described as having 'remained extremely intractable' (Bezuidenhout & Buhlungu 2006:252). Impacting these social relations generally was further to implicate power and class relations. Workers' production demands came into sharp relief. In order to win back their old wage rates, by increasing the level of their own exploitation, workers would encroach on what were previously purely managerial and supervisory prerogatives: supervisors would have to work harder and managerial systems would have to step up organisational efficiencies.[306] Underground, due to the central role of the machine operators in the stopes,[307] whose responsibility it is to break the rock that needs to be moved, *everyone* would work harder.

Examining labour time expenditure in this concrete context, in other words, is found to inextricably implicate matters relating to the technicalities of the mining labour process and social relations in and beyond production. The lost shifts to be made up were not insignificant. The quantity of labour time in question amounted to around 125 000 (official) man-hours, or by a different measure, to around 70 man-years, a quantity of labour time the company was neither prepared nor could afford to lose, despite the rising price of platinum on the commodity resources market. The question is how this lost labour time was to be made up.

Dunbar Moodie has argued that, given the production cycle of supporting the overhanging rock followed by drilling and blasting that dominates the round of the daily shifts underground, '*it is often impossible to make up time safely* when conditions are bad' (1994:72) (my emphasis). While Moodie is referring here to poor geological, *physical* conditions underground and what was confronted here were bad *social* conditions,

[306] These events, while a mirror image of those recorded in a previous chapter, occurred on a different shaft, albeit in the same mining house.

[307] Frost (1987) cites a crude working definition of stoping used by Spandau (1979) as 'the breaking and handling of rock'. I use the word 'moving' following Richard de Villiers (a mine personnel manager and sociologist), due to the fact that much rock is moved - washed (by high pressure water jets), scraped (by mechanical scrapers), lifted (by rock loaders) and transported (by rail) - by mechanised means.

Moodie's contention that *it is often impossible to make up time safely* was to be proved correct.

9.2 Social relations and post-strike organisation

In brief, immediately after the third strike, the mass-based trade unions managed to ensure the re-employment of the machine operators. A consultation process ensued and a formal collective agreement (the 'CA' in company parlance) was signed within the week. There were, however, very stringent conditions attached to the agreement, which the machine operators viewed as exceptionally harsh.

The terms of the collective agreement, signed somewhat in desperation by the unions, were as follows: the machine operators were employed 'afresh' at the pay rate of a novice, were compelled to sign a new employment contract and a separate code of conduct and received a final written warning that dismissal would follow a similar offence. In the face of the company's tough stance, the trade unions agreed that final dismissal would follow in the event of any further strike action. On The Shaft, the machine operators felt trebly punished. They had been dismissed, re-employed as novices and issued with a final written warning. They were equally dismayed at both management and the trade unions which had negotiated the deal on their behalf. These workers had, moreover, become subject to a task team which was to address further aspects of the negotiated agreement. A study of the working environment was to be conducted. It was especially to examine face utilisation (how, when and which rock faces were to be mined), time spent at the face (direct labour time in other words), and an examination of production 'bottlenecks' in the labour process (unperformed surplus labour time). The collective agreement signaled that machine operators were not complying with the regular terms of their job description and this was also to be addressed.[308] It was further agreed that any issues pertaining to this occupational group would only be channeled through a recognised trade union. The organic 'machine operator committees', born under the scrubby thorn trees of the Igneous Bushveld Complex of the platinum mines, and historically independent of both unions

[308] The technical job description of the ostensibly semi-skilled labouring machine operators, it must be noted, runs for 500 pages.

and management, would, it was explicitly stated, *not* be the vehicle of any negotiations with the PGM. Such negotiations had been the case for over two decades, until two years before, with the signing of an employee relations policy into which worker representatives, later to include those of the machine operators, would be schooled. This institutionalisation of a sustained worker struggle, as events would show, related to an old, adversarial relationship, understood by the incumbent mine manager, but certainly not by the workers - *a la* Burawoy (1979) - as a 'game', between long-serving and exclusively black machine operators and an almost equally long-serving group of virtually exclusively white company senior managers.

At least one figure on each side of this divide, signaling social continuity and a collective memory of the history of events, can be identified and traced over more than two decades. Some of the senior managers had in the past themselves dealt with what a now representative management/unions/staff association task team was to confront.

9.3 Task team intervention

The task team, established in terms of the post-strike collective agreement, first sat on 15 February 2004. It was constituted by four managers, four supervisors, four representatives of the National Union of Mineworkers (NUM), and four from the 'Alliance' of the smaller trade unions on The Shaft: Council of Unions of South Africa (CUSA)[309] and the Mouthpiece Workers' Union (MPWU).[310] In order to implement the formal collective agreement, the task team began to evaluate a wide range of issues in order to make recommendations on a broad set of 'focus areas'. The central issue, as the formal agreement put it, was to consider the 'additional shifts to make up for the lost production experienced as a result of the illegal machine operator industrial action'.

By the end of March, the task team had thrashed out its own terms of reference. In April the task team made a technical assessment of the losses on one of the two shafts of the

[309] This is not the federation which went by the same name.

[310] A break away union from the NUM.

mine, which, management argued, urgently required cost curtailment and a reduction of labour. Proposals involving transfers, voluntary retrenchment packages and the employment of sub-contracted labour-hire personnel were discussed, accepted and implemented. The *ad hoc* task team, having thereby established their value in this regard, had proved themselves as a useful organisational mechanism, worthy of being taken seriously by senior PGM management.

In the last week of May, a first Memorandum was submitted to the General Manager. It proposed a plan to address the principal matter of the lost labour time. For once the lost production was made up, it had been agreed, management would address the issue of the machine operators' cut wage rates.

There was considerable preparatory work done prior to the submission of this first Memorandum. Consensus was achieved by creating a common understanding of the principles of the collective agreement through intensive consultation. This process was both political and educative, and was led by the regional HR manager. It was political insofar as groups of workers in surrounding mines were re-familiarised with the company employee relations policy in an express bid to isolate the strike. It was educative insofar as the policy was introduced to newly elected worker representatives on the shafts, some of whom were, in truth, barely literate, yet seasoned and militant workers nonetheless. These men were a mix of 'old' and hugely experienced, often retrenched ex-gold mineworkers, generally from the Transkei[311] and a considerably younger and less experienced group of local workers who had obtained jobs due to complex Royalty agreements - requiring, as previously noted, the hiring of local labour - between the Royal Bafokeng Administration and the various platinum mining companies.[312]

[311] It was reported that these experienced (time-worn) workers from outside the Rustenburg region, who were preferred by many of the white supervisors, would be instructed to provide a local address in order to secure employment.

[312] Mbenga and Manson (2008) track the fascinating history of the relations of the peoples of the Pilanesberg region with the state and the mining companies, from around 1830 to the present.

The task team had first to clear up a number of matters arising. An issue relating to trade union membership fees was resolved. The refusal of workers to repay a R500 administrative fee for PPE (Personal Protective Equipment), deductible from their pay packets, was also resolved. The threat of further strike action at neighbouring shafts was discussed. Critically, agreement was struck with the machine operators to make up the time by way of 'working-in' the lost shifts. An action plan to recover the lost production began to take shape. Relationships on The Shaft generally were noted in minutes as not being good. There was continued concern that the machine operators would not honour agreements to work in the days lost, signaling the degree of hesitancy regarding the machine operators within labour's leadership ranks on The Shaft as the task team had not been 'recognised' by the machine operators. The pivotally central and very active HR manager was urged to be 'tough' with the machine operators. The HR manager countered by saying that he knew what he was dealing with, namely a group of the most militant workers in the whole of the mining industry.[313]

The task team, however, continued to doubt their ability to sustain their agreement with the machine operators, whose informal and unrecognised committee still commanded their allegiance and held their collective attention. The prospect of engaging an external and independent facilitator was discussed as the task team soldiered on.

An action plan was devised to 'work-in' additional shifts to make up for the production lost due the seven lost shift days due to the strike. Attendance (at higher rates of pay) on days 'worked-in', the management representatives on the task team noted, was generally 6% lower on Saturdays and 8% lower on public holidays; this required calculation, as the seven shifts to be 'worked-in' resulted in working-in either 11 or even 14 shifts by one estimate. Increased levels of absenteeism on such days further impacted on productivity underground. Calculating the labour time to make up for the lost shifts, a somewhat unprecedented and peculiar form of historically unavailable labour time in other words,

[313] It was to this echelon of workers that much of the NUM's organising efforts were directed a decade before (Moodie 1994: 250). The reason can be put down to their objectively powerful position in production: these men, as Moodie argued in relation to the 'hammer drillers' before them, were 'the most experienced and most militant black miners' (1994:51).

was consequently not a straightforward matter. The commitment to building the 'employee/employer relationship' was a subject of discussion. Additional work was done to familiarise all participants with the new employee relations policy. Some of the newly elected worker representatives were a far cry from the well-known and regular shop stewards and union officials with whom the managers were familiar.

While the management representatives on the task team consulted extensively regarding the calculations as to exactly how many shifts were to be worked-in, a deadlock threatened. Full co-operation by the whole shaft was required, in terms of the agreement, to any arrangement to work in the lost shifts. The task team had succeeded in ensuring the required '100%' of machine operator commitment to 'working-in' lost shifts, but neither the general workforce of virtually exclusively black general workers, nor the very largely white supervisory personnel, were prepared to co-operate. Mass meetings organised by union and staff association representatives, and communications down 'the line' of supervision, by PGM representatives, failed to secure the required commitment of the whole workforce to work-in any 'off' Saturdays or public holidays. Such days were fiercely guarded, and the rest of those on The Shaft remained angry with the machine operator grouping, who were widely alleged to act like the 'kings of the shaft'; this was, in their view, particularly evident during the strike. This view of rock drill operators by their peers goes back to at least the 1930's (Moodie 2005:561).

Briefly, the machine operators had physically assaulted workers they construed to have 'scabbed' by breaking their 'strike law' or 'mteto'[314] imposed during the strike action. Moodie would most likely understand this as an extension of the moral economy he identifies in South African mines (Moodie 1994). 'Working-in' the additional working time was consequently and understandably refused by the general workers, as this was perceived to be merely to 'assist' the machine operators to win back their old, pre-strike wage-rates. For the operators, these rates reflected hard-won increments, long-service and other increases that had accrued over their working careers. With a good number of the

[314] The informal 'law' of the mine (see Moodie 1994).

machine operators being in their forties and older, this loss amounted to a considerable portion of the value of their labour power which had accrued over time.

The exclusively white supervisory echelon similarly refused to ‘work-in’ the lost shifts, having had to forego their crucially important production bonuses for the Christmas month of December the previous year. These men were adamant about not ‘assisting’ the machine operators win back their original wage rates. This disinclination assumed explicitly, though only privately articulated, racial overtones by the second-in-command on The Shaft, the section manager. Incidentally, a young leading machine operator representative, who turned out to be a strong, legitimate voice of the machine operators and whose underground overall had emblazoned on it in neat capital letters, ‘Communism is the Future’, was absolutely convinced this leading underground supervisor manager was sabotaging events at every turn.

The efforts of the combined leadership task team on The Shaft, then, despite intensive negotiation and consultation with their respective constituencies and agreement with the machine operators, failed to secure the agreement of the rest of the personnel on the shafts. The request for external facilitation was then granted.

Neither the lost bonuses of the largely white supervisors, nor those of the non-striking black general workforce, nor the machine operators’ lost wages - from December 2004 until the time of the reinstatement of the cut wage-rates in September 2005 - were ever to be recovered, the reasons for which will become clear. The company’s production losses were, however, made up in full.

9.4 Assessing a lost labour time issue

With tensions running high, the situation on The Shaft at the time was not conducive to safe and profitable mining. Company, union, staff association and machine operator representatives concurred with this view from their respective, often diametrically opposed, points of view.

Regarding interpersonal relations generally, levels of trust were low, a culture of blame was endemic, charges of harassment, discrimination, victimisation, and ill-treatment had been made, and threats and actual manifestations of physical violence had occurred. An intensely adversarial situation had coalesced into a deeply seated antagonism between different worker groups amounting to a sustained internecine and racialised intra-working class war.

No single social group involved in the conflict - management, unions, staff associations or machine operators - was immune to a broad ranging series of accusations levelled at one another across The Shaft. The general workforce had become disenchanted, and refused consensus-seeking and representatively formulated proposals for combined positive actions in the interests of resolution. The failure of the worker leadership at all levels to secure agreement to work-in the lost shifts was symptomatic of the depth of general antagonism and signaled the extent of the challenge in restoring 'normality'.

Management, for instance, had been accused of discriminatory racially based favouritism, not responding to and ignoring issues raised for their attention by formally recognised trade union representatives and the independent and informal machine operator group. The mass-based worker unions, across the board, had been accused of being ineffective and inattentive to members' and machine operators' demands. Staff association members had been accused of racism, victimisation and ill-treatment of black workers underground. Machine operators had been accused of disregarding fellow workers and usurping unproductive forms of control over production, and found guilty of illegal industrial strike action following threats and incidents of physical violence.

It should be noted that these accusations and charges occurred within the social context of massive unplanned urbanisation and intense competition for jobs, resulting in intense physical conflict and 'no-go' areas in the unserviced, self-built, tin shack-housing settlements in the vicinity of and more broadly than The Shaft. A study, conducted in the region around The Shaft at the time, concluded that the matter of housing was 'generally … ignored in companies public sustainability reports', with corporate social responsibility

initiatives ‘having had little impact on the root causes of social problems surrounding the mines’; a senior manager confirmed that ‘business activities… may be exacerbating social problems’ (Hamann & Kapelus 2004:87-8). Less than a year after the last strike, improvements were taking place at the single-sex hostels and a leading platinum mining house had subsequently undertaken to build 10 000 housing units to begin improving this situation.

The broader ‘social’ initiatives of major mining corporate enterprises aside, and despite rapprochement within the combined stakeholder leadership task team, workforce constituencies continued to refuse to accede to negotiated requests from their leadership. ‘Vendetta-type’ attitudes against other workers had become common, with local communities implicated in these troubles.

A dispirited task team had not provided a critical mass of personal commitment and collaborative continuity to expedite matters arising, let alone the timeous resolution of the situation. Union representatives had proved unable to break the culture of social antagonism by securing the necessary goodwill of their constituencies. Representative structures were clearly out of touch with their members. A general inability or unwillingness to appreciate the longer-term consequences (lack of co-operation, decreased production and potential job losses) was recognised by leadership of all constituencies as requiring urgent attention.

Such was the situation resulting from a struggle over the labour time issue of annual leave. The details of how this situation was approached must await another occasion, for more important for current purposes is how labour time suffuses the issues that were raised by the task team, shortly to be subject to external conflict resolution facilitation.

Briefly, the mass-based trade unions, the staff association and the independent machine operators’ worker representatives outlined their combined perceptions and understanding of the situation. A general state of ‘unhappiness’ predominated. This had been communicated to management, but no active response had been forthcoming. The key

issue, expressed by black workers in general and by machine operators in particular, was that, despite high levels of unionisation, they had no voice. Changes to rules and procedures, it was broadly alleged, were made without consultation and implemented without prior warning, resulting in disquiet, undue inconvenience and unsafe working conditions. Changes to the shaft schedule, for instance, resulted in inordinately long waiting times underground at the shaft stations. Applications for leave were not expedited, resulting in unnecessary domestic and social disruption. Material supply was considered poor, resulting in supervisor-operator conflict. Supply chain dysfunctions were reported to be acute: safety-threatening practices of improvisation (*planisa*) had apparently exceeded 'normal' mining practice (see Phakathi 2001). Day shift preparation for night shift was inadequate, resulting in instances of unperformed surplus labour (serious delays in drilling starting times with consequent extension of the working day), late exit to surface, and shifts of 12 hours and more. Overtime for late shifts was not always paid, thereby devaluing labour time. Workers were being disciplined for short shifts, even if the job had been completed and permission granted from the miner responsible to leave working places. Wage incentive payments could not be readily calculated. Based on workers' experience, the number of shifts worked and the number of meters advanced at the face did not translate into anticipated remuneration received in pay packets. It was strongly felt that calculations did not make sense: drilling bonuses were either paid late or not at all, and were unpredictable.

These issues have long been little understood by team leaders, let alone workers (Leger 1985: 54-62). In addition, there were grumbles that the machine operators' wages were too low; this matter constituted an ongoing issue. It was queried whether the company was insured against industrial strike action; this was promptly denied. Promotions and appointments, a generalised complaint (Bezuidenhout & Buhlungu 2006:252), were considered one-sided, insofar as they were perceived to be discriminatory towards people with long service against those who had been in 'acting' positions. Race was asserted as the primary criterion for promotion and advancement, both on surface and underground, thereby confirming recent research in mining (Bezuidenhout & Buhlungu 2006:252). The harassment and victimisation of black union leaders by white supervisors was strongly

expressed, the relationship between supervisors and workers, also having long-been a fraught one (Leger & van Niekerk 1986), born of the 'steel divide of race' of over a century before (Harries 1994: 126). Leave, for instance, was said to be refused particularly to black shaft-steward union leaders. It was claimed that workers were ill-treated underground by way of being subject to shouting and swearing.[315] The issue of leave not being granted was said to have been a strong contributory factor to the strikes in 2004, this not being compliant with the BCEA, which states that leave must be taken after 12 months' continual service. 'Family responsibility' leave was periodically not granted, resulting in distress and unhappiness. 'Knocking-off' late, representing further unpaid labour time, emerged as an issue contributing to general worker dissatisfaction. Needless to say, virtually all of these issues 'waste' wages and hence decrease the value of labour power, signaling managerial practices corresponding to a despotic absolute surplus value regime.

A frustration with the length of time taken to resolve the issues on the table was expressed, including the comment by a worker that the task team session of the day, disrupted by these issues, was to have considered appropriate action regarding the matter of machine operators' remuneration and leave. Finally, the question arose how long it would take to resolve the issue, as there had already been much 'sitting around the table'.

Meanwhile, the continuing impasse aside, being out of pocket, the machine operators wanted to be paid after each made-up shift and the general manager wanted action from the task team. Despite all this, the bitter irony was that the mine continued to boast one of the best production records at PGM. This was clearly a very largely competent and hard-working mining community. This is well known to be particularly true of the machine operators, who play the most direct productive role in underground mining.

[315] See the debate between Moodie and Breckenridge (1998) on violence in and on South African mines.

This central occupation within the mining labour and production process was originally described as the Jack Hammer Hands (JHH's) or later simply as the 'hammer boys' (Harries 1994: 14). In current job descriptions the job is officially termed Rock Drill Operator (RDO), but these workers are currently generally known as the 'machine operators': the men who drill the rock faces underground, only very recently joined by a tiny handful of women of whom there were none on The Shaft (see Benya 2010).

9.5 The Jack Hammer Hands and rock drilling

The name of the machine operator's job has a distinctive origin. With the discovery of the Main Reef in 1886, the South African gold rush began in earnest. Money and people, investors and labourers, flocked to Johannesburg. Significant among them were the internationally mobile immigrant miners who had worked on the gold mines in California and Australia. The Cornish specialist hard-rock miners were to play an important role. They drilled the hard quartzite rock at the face underground with hammer and chisel. The 'Jack' would hold the chisel, while his 'Hammer' would, in regular unison, deliver the hammer blows on the head of a series of chisels of different lengths. Chisel-sharpening was consequently a crucially important artisanal craft occupation at the time. With every blow, delivered in rapid succession, the 'Jack' would twist the chisel before the 'Hammer' would deliver the next powerful blow (Harries 1994:15).[316] When the shards of rock in the ever deepening hole prevented any further purchase of the chisel onto clean rock in the drill hole, the hole would be flushed out (Moodie 1994:47). In earlier times, 'Every few minutes the miner lubricated the drill by squirting a mouth-full of water into the hole' (Harries 1994:115). When the depth was sufficient, explosives would be rammed and the hole would be plugged. The specific arrangement of holes drilled into the rock face constituted the traditional skill of the miner (Leger 1985:98-99; Harries 1994; Katz 1999). This pattern of shot-holes, known as the 'burden', would then be connected with igniter cord and fuses lit to achieve a blast designed not to damage either the footwall, on which

[316] The air-feed rock drill, which replaced the jack-hammer, is more efficient as its pneumatic power includes a twisting motion to the lateral percussion of the jack-hammer which 'chips' away at the rock (O'Donovan 1985: 54).

the miners stood or crouched, or the 'hanging' roof above their heads in the 'stope'.[317] To drill a hole of 36 inches in a shift was then the norm for a fair day's work. African mineworkers, particularly Shangaan workers from Mozambique, were quick to take over this skilled 'hard rock' miner's job. 'As Shangaans stayed on the Witwatersrand for longer periods than other workers, they were invariably better trained and, working underground, earned *above average wages*' (Harries 1994:113ff) (my emphasis). These men, over a century ago, 'rapidly became an elite' (Harries 1994:114). Having won a rare historical and moral component of their wage, these workers would refuse to drill more than one hole per day - despite it having been proven to be well within their capacity - in the legitimate fear that more than one hole would become the norm for a day's work.

Engineering designs were to emulate the twisting motion of the human hand in the design of the 'jack-hammer' drill, which bears the names of the men who first performed this job by hand. By 1899 an ungainly machine nicknamed the 'Slogger Drill' (Cartwright 1962) had been introduced by American engineers. These engineers were to provide the economic and technological leadership of the industry; the legacy of their professional craft, technical authority and managerial skill, including the introduction of Taylorite 'scientific management' (Bozzoli 1981; Nkosi 1987; Leger 1985), carries through to the present day. The adoption of the Slogger Drill at the rock face was eventually to dispense with the hammer and chisel. It resulted in a dramatic change to the composition of the labour force. By 1897, African workers, previously engaged solely in hand-drilling and unskilled lashing work underground and responsible for all physical labour, were employed to assist with operating the drills, supervised by the 'de-skilled' white miner (Katz 1976). African workers' numbers were to increase dramatically. While in 1905 the British miners constituted around 85% of underground white workers, the numbers of these immigrant workers would rapidly decrease. As Moodie notes, by 1908, for instance, 100 000 such shot holes were drilled in stopes daily by native 'hammer boys' (Moodie 1994:47).

[317] Under changed organisational conditions - the flattening of the underground occupational hierarchy in particular - the 'stope' has latterly been referred to on some mines as a 'panel'.

In 1907, even more dramatic changes were to accompany the introduction of the considerably more effective hand-held rock-drill, the one invented by the company Ingersoll, for instance, becoming a common standard. Apart from additional power, neither this machine drill, nor the light-weight rock drill that replaced it, nor the process of stoping has changed appreciably since (Frost 1987). 'Little work has been conducted on sourcing alternative hole-making methods, nor the design of the actual drill,' contends a recent engineering report (O'Brien *et al* 2006). The addition of an hydraulic air-leg - and later the tungsten carbide drill bit, which both lasted longer and reduced the time spent changing bits, signaling a rare moment in relative surplus value extraction at the stope face - is the most visible single modification and greatly facilitates its use (see O'Donovan 1985:54). Operators no longer need to hold the drill horizontally while exerting pressure on the drill either by the force of their legs or through the weight of their bodies. Moodie (1994: 53) importantly points to the intense struggles between capital and labour centering around this major technological innovation. He makes the point that even the smallest changes in mining contexts involve intensely contested sets of struggles and the reconfiguration of continually conflictual and racialised social relations. What follows in this chapter merely provides an instantiation of Moodie's insight when he writes:

> If the adoption of what appears to be such a simple technological improvement as the jackhammer drill was so dependent on its strategic context, reorganisation of the social relations of production was far more difficult to achieve (1994:53).

Before addressing Moodie's point regarding the 'reorganisation of social relations', I must note that the introduction of the jack-hammer machine had one particularly serious consequence which continues through to the present. The sheer number of these cost-effective and more manageable drills that came into operation, had the unintended effect of decimating the immigrant workforce by early death from silicosis and miners' phthisis due to inhalation of the dry, noxious silica dust the machine produced. These diseases resulted in a low life expectancy in underground workers. In 1912, before the watering down of the underground stopes and modern ventilation systems were developed, rock drillers in particular were severely affected, dying at an average age of 33 years (see Katz

1995). After they were depleted by this occupational disease, by a full half by 1914, a new social group of African mineworkers began to take their place. Despite massively improved ventilation systems, dust remains a significant health risk underground, a worker recently countering in a focus group that instead of conducting research on noise-induced hearing loss (NIHL), the problem of dust should have been the topic investigated (Franz & Edwards 2009).

A peculiar status has long been attached to this occupation, generally deemed unskilled, yet recognised in the academic literature, as by their peers, as embodying significant measures of tacit and practical skill (Leger 1985; Harries 1994). In 1958 a machine driller was considered to be the most attractive job on a mine (Glass 1958, cited in Parsons 1977). By 1976 it had dropped to being the third most attractive job (MacAllister 1976, cited in Parsons 1977). But by 1976 a non-strenuous mining job had replaced wages as the most important reason workers cited for liking 'good' jobs (Parsons 1977:40) Whatever the current situation, these men are generally awarded often a grudging and often open degree of respect within mining communities and it is to one of their struggles, introduced above, that we now must turn.

9.5.1 The background to the machine operators' struggle

Regarding the group of machine operators on The Shaft, their demands need to be put into the context of a longer struggle, which, according to internal company documents made available, can be traced back to around 1985. It relates to the key matter of the machine operators' job description, their job grading and pay rates in a particularly stressful job under working conditions that in 1987 were described as 'extreme', 'racist and dehumanising' (Peeke 1987:48).

Two decades ago, when two-handed drilling was the norm, machine operators (the 'jack') and their assistants (the 'hammer') were on level 5 of the standard South African mining industry Patterson grading system instituted in the 1960s when the 'maximum average' system came to an end (Moodie 2005: 547). They were upgraded to level 6 or 7 in the same year, depending on whether the most recent version of the 'lightweight drill' was

being used. In retrospect, there has been a remarkable degree of stability overall in the job of machine operator since the introduction of the hand-held machine rock drill in 1907. David Frost dates the introduction of the 'light weight reciprocating rock drill' to between 1905 and 1915 (1987: 6).

An apparently newer, modified lightweight rock drill,[319] the first incarnation of which was introduced seven decades earlier, saw negotiations between employee trade unions and PGM elevate machine operators to level 8 three years later in 1988. This change in wage scale was accompanied by 80% of the assistants' production bonus (later negotiated to 100%) in addition to regular machine operators' bonuses, in exchange for drilling without an assistant, in other words one-handed. In other words, in exchange for doing *two* jobs, the machine operator took over the bonus, but not the wage, of his erstwhile assistant. There is no mention in the records available that production targets were reduced. The majority of gold mines, it might be noted, currently continue with two-handed drilling; one-handed drilling was never witnessed in a series of underground gold mines visited over the last decade.

Subsequently, increases to the machine operators' production bonuses were implemented, one being in March of 1992. This was done particularly in situations with narrow stope-widths and uncomfortable and difficult rock breaking conditions underground, where the geology is stratified and the rock is friable and very different from gold bearing substrates. This appears to have occurred without trade union intervention when wages were increased at a time when PGM prided itself in being the best paying mine in the area. This proud claim does not seem currently to be a matter of concern. It is of interest to note that this particular 10% increase in the bonus applied to mining in stope-widths of less than 115cm, whereas a decade later stope widths are often a challenging 80cm in

[319] There appears to be no history of the evolution of this standard and central piece of mining equipment.

platinum mines, 90cm often being the targeted norm in a range of platinum and other gold mines.[320] This bonus increased a further 8% a year later.

On The Shaft, the stope width on which budgets were calculated was 94cm and the face advance was 8m per month per stope face, while actual figures averaged around 102cm and 10m respectively. Where miners boast about their tonnage or centares mined - the number of cubic meters (the length of the stope face multiplied by the face advance) of rock blasted - critical peers always inquire about their stope-width. If this is wider than accepted norms, they ridicule such boasts by charging their peers with mining rock instead of platinum or gold: an important productivity measure is grams per ton, which, with a given head grade (actual grams per ton in the ore-body), is heavily dependent on stope-width. Mining low stope-widths requires both skill and a significant degree of personal commitment, as the space within which the miner works is more cramped and uncomfortable the narrower the stope width - which must be understood as the 'height' of the stope from 'footwall' to 'hanging wall'. Much surplus value hinges on the measure of grams mined per ton (depending on both geology and stope width), crucially related to this measure.

Such daily fraternal altercations and rivalry among the miners aside, sometime later, PGM signaled that, while it continued to be the best paying mine in the area, it was nevertheless willing to meet a delegation of machine operators, with the proviso that no meetings would be granted under the threat of industrial action. The matter of installing additional compressors to increase air pressure to the rock drills - as occurred again in 2004 - was also noted: this would permit a decrease in the time taken to drill, thereby improving productivity, and, of course, socially necessary labour time, by way of mechanised relative surplus value extraction. In the same year, 1995, the drilling bonus was increased by a further 8% and an additional 3% adjustment in line with that year's wage negotiations. But this was not enough to prevent matters eventually culminating in the

[320] The capacity of a skilled hand driller to 'follow the gold seam more closely than a miner with a compression drill' and work in a 'confined stope', hence keeping waste rock to a minimum' was a key argument against the introduction of the mechanised hand-held rock drill (see Harries 1994: 15 and Moodie 1994: 50-53).

entire occupational group of 3 616 machine operators across PGM going out on a strike in 1999, illegal in terms of the legislation at the time. The demand of the machine operators, to be raised to level 12 of the wage scale, was not met. An agreement signed between the PGM and the NUM brought these matters temporarily to a close.

These events are of significance, as will become clear later. Suffice it to say that the issues of the machine operators' job description and job grading were closely related, and that this repeated itself a decade later at The Shaft, which could be said to represent the last outpost of a much broader opposition to a series of technical developments and subsequent changes to the machine operators' working conditions underground.

9.5.2 Recent events

In 1999 it was noted that team-work and 'meters drilled per operator per shift', a measure not currently in general use, impacted on the bonuses awarded. Less than a decade ago, an increase above a specified target amounted to an average of an additional R40 per month in each operator's wage packet. The measure of 'meters drilled per operator per shift' was, however, to become the basis for the new negotiated targets to improve overall face advance per mining section in order to resolve the impasse the machine operator group faced after the annual leave strikes in 2004.

In the strike year of 1999, the machine operators were generally dissatisfied with their work situation, directing this dissatisfaction at both management and the unions. The establishment of informal 'machine operator committees' across PGM had led to the more direct involvement of a then fairly recently established union prepared to take up their cause. A group emerged calling itself the 'Five Madoda' - the five 'Men', the term 'madoda' being replete with macho masculine connotations of what it is to be a 'real man' (see Campbell 2001:277), a phenomenon deeply embedded in cultural understandings of moral integrity (Moodie 2001:302ff). It appears that from this group the Mouthpiece Workers Union (MPWU) was initiated and began to articulate the machine operators' concerns. This would square with Moodie's argument that born out of a crisis of integrity in migrant cultures, 'some of the old men of integrity were eventually moved to defy the

union' (i.e. the NUM) (Moodie 1994:306). Within the federation of COSATU, of which the NUM and these machine operators were initially part, certainly since the early 1990s, acknowledgements were made that political issues had overshadowed traditional trade union issues: 'We were not focusing on improving production, the quality of production … We were not making demands around production' (Buhlungu 2000: 81). This continues into the present.

The production demands of The Shaft machine operators regarded not only the drilling bonuses and their calculation, but proposals to increase their wage scale to level 14 and to be remunerated the salaries (not just the bonuses) of their erstwhile assistant 'hammers', as well as a re-evaluation of the job description of machine operators on the wage band scales. Present in these meetings in 1999 of machine operators was The Shaft delegate who became central in the strikes on The Shaft in 2004 and who had been the president of the 'central committee' of the machine operators' committee structure, a clearly charismatic militant known as 'Ma-help' - the one who helps. For the mine manager of The Shaft he was a 'Hitler'.

The bold claims put by the machine operators - and the MPWU most visibly representing them at the time - were not met by PGM's management. Trade union rivalry across the mining industry as a whole was intense and spilled over into violence, epitomised by the tragic death of an NUM organiser, Selby Mayise (Bezuidenhout & Buhlungu 2006: 261). It was very tense on the gold mines that day when researchers pitched up to do a stint of ethnographic research of living in the mine hostel of Motebong on Tautona Mine, previously Western Deep Levels no 3 shaft, for long the deepest mine in the world and but a stone's throw from where Mayise had been killed.[321]

[321] The meeting that resulted in Mayise's death was a report-back regarding the Mineworkers' Provident Fund. What had it seems not been discussed with the workers was that only one beneficiary - a man's first wife - could be documented in the event of a member's death, and some workers had more than one wife whom they wished to benefit from any payments made by the Fund in the event of their death.

On the platinum mines, a PGM-led intervention attempted to address this situation. It was shortly thereafter that steps were taken to establish a fully negotiated Employee Relations (ER) policy. The machine operator committees established across the company were formally, if not entirely in spirit, integrated into the ER policy, which was signed off by all stakeholders after much negotiation three years later in 2002.

It was only at The Shaft that dissatisfaction among the machine operators resurfaced openly, the informal machine operator committee being re-established, due particularly it would appear, to the involvement of 'Ma-help', the militant ex-President of the then defunct machine operators' committees. After having apparently dissolved after the ER policy signing in 2002, the machine operators' committees re-emerged at the beginning of 2004. They became 'more visible' in March of that year. In fact they became 'very visible' according to the HR manager, congregating outside the gates of The Shaft. Once underground the machine operators started a work-to-rule, closing their machines at 1pm, exactly eight hours after they had hoisted down, instead of the nine hour, 20 minute shift as per 'normal'. They would, however, be forced to wait for the hoist at the shaft station, only to catch the scheduled 'cage' as normal.

Waiting outside the gates may have been of symbolic significance, pointing to the question of whether their action constituted a strike. After being addressed by the regional HR manager, the machine operators proceeded through the gates to clock in at the crush and go down, only to stop work precisely eight hours later, requiring highly co-ordinated and disciplined action. Given the long struggle for trade union recognition, as well as the fact that these workers had just lost their capacity to bargain directly as a group with management, in the absence of further information, the congregation outside the gates of the mine may have been an attempt to assert the *de facto* organisational presence they had previously enjoyed, despite having becoming members of a union in opposition to the NUM.

Whatever the case, the continuation of these informal machine operators' committees constituted, from management's as well as other workers' point of view, a disruptive role

in production as they articulated their specific demands; this role ultimately manifested itself in the three strikes in 2004 and the operators' subsequent dismissal. Given the contemporary restoration of managerial authoritarianism through subcontracting within the industry, the erosion of internal trade union democracy and emerging divisions within the NUM due to a variety of factors (Bezuidenhout & Buhlungu 2006), and the resulting lack of focus on the shop floor, the machine operators clearly sought other avenues to advance their production and workplace-based demands.

9.5.3 Trade union affiliation as at November 2004

The focus on the changing job descriptions of the machine operators to one-handed drilling, as a result of the introduction of the new lightweight drill, applies specifically to the stoping machine operators. The composition of this occupational group of machine operators within the broader bargaining unit and their union affiliation points towards where their sentiments lay.

At the time of the November 2004 industrial action at The Shaft, the occupational category of the machine operator comprised the following job roles, listed along with their numerical strengths:

Lightweight Stope Machine Operator	246
Developing Machine Operator	137
Drill Rig Operator	12
Miscellaneous related occupations	15
Total number of machine operators	410

These figures indicate the numerical significance of the lightweight stope machine operators, who comprise 60% of the machine operator bargaining unit. It was this particular group on which attention was primarily focused in the work of the task team in their attempts to overcome the impasse, and who had been central in alienating both their fellow workers as well as the supervisors in their struggle at PGM. The following table indicates the relative union strengths in the machine operator bargaining unit.

The Shaft: Union Affiliation as at November 2004		
Employee Organisation	*Membership*	*%*
MPWU	204	50
NUM	125	30
CUSA	11	2,6
UASA	2	0,4
Unaffiliated	68	17
Total	410	100

Union representation among the machine operators, as a whole, was significantly over 80%. Among the lightweight stoping machine operators, the MPWU topped the 50% mark and had 129 or 52,4% membership, the NUM held 30% of their allegiance, and 17% remained unaffiliated.

There is a significant consequence of these figures. Prior to the signing of the ER policy in 2002, the documentation available reveals that the machine operators had been able to elect a delegation of 10 of their number and negotiate directly with company management accompanied by their MPWU representatives. Machine operators on The Shaft wanted this practice reinstated. The ER policy and the collective agreement signed by all the unions after the strike expressly precluded a return to this form of representation. It was clear from the outset of the facilitation process in June 2005 that the machine operators were not in favour of electing two of their number with observer status on the task team, i.e. one NUM delegate and one from the 'Alliance' of MPWU and CUSA. Machine operators felt this would 'divide' their strength in what had become a matter of political power-play on The Shaft. With little option left to them, the machine operators eventually decided to elect two of their number to sit beneath the flags of the two main rival unions, but not without mutterings that masked a substantive threat.

For in the wake of the refusal of the rest of those on The Shaft to work in additional shifts, the machine operators now began to threaten to all take their leave on the day they were re-employed. This they would legally have been entitled to do, taking advantage of their knowledge that the new computer system marked the day annual leave was to be taken to be exactly one year after the date of employment. The machine operators were effectively

threatening PGM with what would have been an unprecedented form of legal 'strike', all having been signed up on the same day after the December 2004 strike. With PGM as a whole at an impasse at this point, external facilitation was initiated.

9.6 Facilitation

After a series of meetings with the task team, marked by intensive discussion on matters of representation, full acceptance of the ER policy, the role of the two machine operator representatives and access to more extensive documentation, the overall objectives were set: to normalise working relations, secure full agreement to work in lost shifts and move towards realising senior management's concern to 'improve' conditions on The Shaft 'technically, organisationally and culturally'. The key objective, defined by the facilitator, was to recover the financial losses of PGM, the supervisors, the general workers and the machine operators' lost wages in order to attenuate the deeply-seated antagonism on The Shaft resulting from the strike. This meant saving a significant tranche of labour time. Meanwhile, the rest of the workers, artisans and supervisors on The Shaft stood firm in refusing to sacrifice valuable leisure time 'saving' the machine operators.

Facilitation immediately began to focus on one matter noted in the collective agreement which was directly under the control of the machine operator: the optimisation of face time, the central key to the mining labour process. In other words, it focused on direct labour time, the source of net surplus value. A key intention in the collective agreement was to ensure the regularisation of both production matters and social consequences of the actions the machine operators had taken. As noted, the machine operators continued to work for strictly eight hours 'bank-to-bank', closing off their drills before the official end of the (extended) shift, moving to the shaft station to await the hoist to surface. Where individual machine operators did not follow this practice, they were heavily fined by having to purchase meat for a large *braai*, or what became known as 'Ox' fines.[322] To ensure disciplinary control within their ranks, the machine operators turned dissident

[322] An ox cost around R3 000, roughly twice an average monthly wage; this disciplinary practice internal to the machine operators' committees becoming the 'mteto' or law among the informally organised machine operator group.

actions at the point of production into a feast of a social occasion, much to the continued chagrin of the rest of The Shaft. The machine operators were ensuring the success of their point of production struggles by transforming the necessity for industrial strike discipline into a cherished and ancient cultural event in the hostel compounds, the celebration of slaughtering an animal.

At the heart of resolving these issues (which, for management, included bringing to an end the practice of 'Ox fines') lay the matter of the machine operators' previous pay rates, forfeited as a result of the strike. The overall intention of the task team was to take the matter to the higher authority of PGM's company-wide union-management partnership forum. Facilitation demurred. Only all too acquainted with slow-moving, quasi-corporatist bureaucratic organisational politics at PGM, facilitation urged for resolution at the level of The Shaft on the grounds that matters dealt with at their source stood the greatest chance of successful and sustained resolution. Matters referred to the central partnership forum would be time-consuming, with no guarantee of dedicated attention or resolution. More senior trade union leadership, separated from the issue, were, moreover, likely to resist the envisaged productivity deal, causing undue tensions between the rank and file and themselves, this not being unusual in such instances (Buhlungu 2000:80). However, as will become apparent, the facilitation process, which amounted to an unusual form of participatory management, did in part 'translate into material benefits for the workers', (which is generally not the case (Buhlungu 2000:80)) even if it was but a return to the *status quo*. As it turned out the machine operators had to do more than this. They ended up with only one option: to intensify the expenditure of direct labour time at the rock face.

The machine operators' issue of annual leave took immediate precedence. The combination of collective fatigue on the part of the operators, a significant proportion of whom were due for annual leave, and their continued threat of all taking leave on the same day as was their right, ensured it assumed the highest priority. Of the 450 operators,

357 were overdue for leave: 35 for up to six months; 141 from between six months and one year; 157 from between one and two years, and 24 by over two years.[323]

Presentations were made by the HR personnel responsible for leave arrangements, and a series of demands matters relating to the Holiday Leave Allowance (HLA) commanded attention. After a process of clarification on the technical issues and calculations and negotiations over the HLA, a leave roster was drawn up, discussed at mass meetings with the machine operators and the taking of leave of those most affected was expedited. With a formal Leave Agreement signed off and a roster put in place, the machine operators began to take their overdue leave. A further series of issues were then tackled; the calculation of the off-cycle simulation pay slips issued after the strike - called 'spook'[324] pay slips - proved exceedingly complicated. The 'pay master', officially the Employee Benefits Manager, appeared before the task team to explain the complexities involved. An error regarding a company-wide 'benchmarking' exercise, impacting on the machine operator's job and inexplicably affecting only The Shaft, was met with suspicion and added to the time taken to resolve outstanding matters, resulting in a threat of further strike action due to a perceived lack of action on the part of the task team, averted only by an authoritative intervention from the mine manager. Meanwhile the general manager was pressing for progress on how the task team was to resolve the matter of making up the lost time, and the machine operators were, by July, becoming increasingly impatient about their still reduced pay rates.

9.7 Machine operators' pay rates and working-in arrangements

The burning issue of the lost wages was to be addressed by intensifying direct labour time. During July, the issue of the machine operators' pay rates assumed increasing importance after they began taking their annual leave, and a further range of subsidiary matters were resolved. Working-in additional shifts - lengthening the working week (an absolute surplus value extraction strategy) - was out of the question. What was left was to

[323] Internal Company Memorandum entitled 'Rectification of machine operators annual leave situation on PMG shaft', dated 4 July 2005.

[324] 'Ghost'.

focus on the central control the machine operators exercised over the mining labour process and to find a strategy (which ended up combing both absolute and relative surplus value extraction strategies) in order to meet the requirements of the collective agreement.

Alternatives were sought and discussed at length. What emerged was a decision to focus on the measure of face advance. This is the measure of how deep shot holes are drilled with each drill and blasting cycle, a single such cycle being the goal of every shift. (A daily blast has long been the measure of the task for a day's work underground and the basis for the measure of the blast frequency rate - essentially measuring the rate of net surplus value extraction for the occupation of rock drill machine operator and their support crew.) This could be said to be a variant of the 'hole-contract' system devised by the American mining engineer CR Davis in 1901 (see Ochs 1992). Considerable time was spent ensuring the practical feasibility of using face advances as a measure and the means whereby the lost shifts could be restored. After much discussion, calculation and formal presentations at task team meetings by the managers from the Surveying and Rock Mechanics Departments, focusing on face advance signalled a real way forward out of the impasse. The machine operators, kept informed at every stage, concurred with the strategy. Detailed technical proposals were crafted for presentation to the general manager.

What amounted to a productivity agreement gradually took shape. Increasing face advance was under the direct control of the machine operators, who further agreed to suspend their work-to-rule over the length of the working day, in order to regain their original wage rates. This was necessary, and accepted as such, to facilitate the optimisation of face time (direct labour time) compromised by the early closing of the drills at the rock face. Face utilisation, how and which rock faces were to be worked and co-ordinated, received attention at management level in terms of the overall mine plan; production bottlenecks and other production-related issues - impacting on unperformed surplus labour - were to be addressed by the task team in a series of underground visits.

A second Memorandum was crafted and found acceptance from the general manager. This Memorandum, taken *verbatim* from what I continue to treat as part of the internal company documents in my possession, dated 26 August 2005, had two key 'milestones' to be achieved. These were summarised as follows:

> 1/2m face advance above target per month will be achieved for two consecutive months, Sept/Oct 2005. Pay rates will be reinstated from 1 September. If this is not achieved no pay rate adjustment will occur and the shifts to be worked in still to be negotiated as per the Collective Agreement.
>
> 1m face advance per month will be achieved above target on measuring day, 20 Sept 2005 and maintained through to December 2005 and the 2004 pay rates will be reinstated from 1 Sept and the working-in arrangements falls away.
>
> If 1m face advance per month from Sept-Dec is not achieved, working-in arrangements will be scheduled for 2006.

The final, detailed technical report-cum-business plan and concrete set of proposals prepared in support of the Memorandum was finalised after much deliberation in the task team, management consultation with principals and union discussions with the machine operators at mass meetings. Submitted to the General Manager, the Memo was signed off and was to be implemented on 20 August at the beginning of the new measuring month. Notices regarding this agreement were posted in the hostels, in the lamp room and at the entrances to both of the shafts. Other important elements in the Memorandum included the issuing of job descriptions to the machine operators,[325] the rationale for the strategy adopted and other subsidiary matters.

9.8 Implementation initiatives

A series of technical, organisational and personnel issues needed to be confronted and monitored if the face advance initiative was to succeed. This involved the trade union task team members in face-to-face engagements with individual underground supervisors, the

[325] This never occurred.

Mine Overseers; this directly challenged them insofar as it required changes to their routines. Importantly, the Mine Overseers attended task team meetings during this period. As previously noted, the jurisdiction of these men had changed over the years as restructuring of the organisation of the underground workplace had taken place. These were the self-same men who had lost their Christmas bonus the previous December and had refused to assist the machine operators in winning back their lost wage rates. A series of underground visits allocating task team members to individual Mine Overseers, men with considerably more knowledge of production and mining, was to prove instructive for the unionists, for this was a radical intervention in changing social relations in production itself.

9.8.1 Underground visits

A special meeting with a somewhat sceptical group of Mine Overseers, at least one of whom was openly hostile, was held in the boardroom of The Shaft, 10 critical days after the official launch of the new agreement. Task team trade union representatives allocated themselves to the various Mine Overseers into teams of two for the necessary monitoring exercise. The two ranks of men facing each other perfectly mirrored their respective racial groups. The text could not have been clearer: black trade unionists were to ‘monitor’ white supervisory Mine Overseers.

The results of the underground visits were to be reported, typed up and collated. These underground monitoring visits were due to take place on a daily basis in the last two weeks of September. A wide range of practical, technical, organisational and personnel issues, faced daily in underground mining situations, were recorded. The issues noted were deemed to be impediments to achieving the target of the first ‘milestone’: an additional half metre face advance above mine plan target.

In October, preferring safety in numbers, the union task team members conducted six visits as a single group. In at least one instance, a problem faced by machine operators underground, who were reluctant to participate, was resolved. The task team had also

come head-to-head with a phalanx of resistant machine operators, but won them over in terms of their own agreement. A summary of key issues reported per mining section, constituting the detail of matters within the mining labour process, is noted in the table below.

The Shaft: Underground visits

Issues and Description	262	263	264	265	266	274
Absenteeism	✓	✓	✓	✓	✓	
Lack of Equipment	✓	✓	✓	✓	✓	
Lack of Material	✓	✓	✓	✓	✓	
Shortage of Labour	✓	✓		✓	✓	✓
Lack of Communication		✓	✓	✓	✓	✓
Night shift does not clean	✓		✓	✓	✓	
Safety Issues	✓			✓	✓	
Shortage of Ventilation pipes	✓					
No meetings with management					✓	
Shortage of panels					✓	
Refusal to sign leave forms					✓	
Problems with the HR Assistant					✓	
Late comers					✓	
Ventilation problems	✓					
Gang make ups incorrect	✓			✓		
Surveyors give wrong drilling information	✓					
Mine Overseer use vulgar language		✓				
Blast while workers are still under ground	✓				✓	
Problems with PPE (inadequate knee guards)				✓		
PPE Stores close to early in the afternoon	✓			✓	✓	
Clocking problems	✓					
No underground toilets		✓		✓	✓	
Complains about level control				✓		
Underground stores to far from working place	✓				✓	
Problem with the lamproom	✓					
Drinking water only available on station				✓	✓	
Complain about electricity		✓				
Safety rep does not visit the working place					✓	
M/O does not want to sign notes					✓	
Roof bolt spanner too heavy	✓	✓	✓	✓	✓	

The major issues noted - every single one of which impacts on maximising direct labour time and minimising unavailable surplus labour time - were absenteeism, lack of equipment, lack of materials and labour shortages. These factors essentially reduce to a lack of sufficient men and materials to get the job done. These particular issues, which go back decades (see Burawoy 1972:247), are endemic to mining and are consistently not given sufficiently serious attention throughout both the gold and platinum sectors. Simply put, poor technical organisation of production wastes labour time.

Unaccustomed to the rigours and temporal discipline of reporting underground on a daily basis, the trade unionists only conducted 20 out of a potential 160 visits; more such visits could have greatly facilitated task team and Mine Overseer co-operation. The information

base of problems in working conditions would have been extensive, *whether such problems were perceived or real.* This information would have provided the basis systematically to identify technical constraints, policy and procedural inadequacies, and worker dissatisfaction. The trade unionists were not up to the task, confirming the dim view that the supervisors in general and the Mine Overseers in particular had of them. The notable exceptions were immediately spotted by management and identified for individual 'grooming' and mentoring with a view to promotion up the ranks at PGM. For as the literature has shown regarding the 'the position of the shop steward … this layer of union leadership is a popular recruiting ground for management in the industry' (Bezuidenhout & Buhlungu 2006:250-1).

9.8.2 Monitoring absenteeism

A particular concern raised by the trade unionists was the number of workers being turned back at the shaft due to arriving late. This complaint, expressed by their worker constituency, was not conducive to achieving the new face advances. Arguments were presented that often the reasons for lateness were genuinely beyond the control of men, such as the bus transporting underground mine personnel not arriving on time. These matters were solidly within the range of their experience, as opposed to the tougher production details, which were management's traditional prerogative and which they were unable or unwilling, in the main, to tackle. An agreement was reached to monitor the extent of this occurrence, the results being reflected in the following table.

THE SHAFT: LEVEL CONTROL EXERCISE						
DATE	S262	S263	S264	S265	S266	TOTAL
14-Oct	1	3	0	0	0	4
15-Oct	3	5	1	1	2	12
17-Oct	0	3	0	5	3	11
18-Oct	1	3	0	1	2	7
19-Oct	1	2	0	0	0	3
20-Oct	2	3	0	2	0	7
21-Oct	2	4	0	1	2	9
24-Oct	1	5	0	3	0	9
25-Oct	3	0	0	2	1	6
26-Oct	1	1	0	2	0	4
27-Oct	3	3	0	1	1	8
28-Oct	2	0	0	0	3	5
29-Oct	1	3	0	2	0	6
31-Oct	10	6	1	6	0	23
1-Nov	1	9	1	2	0	13
2-Nov	4	7	1	3	2	17
3-Nov	1	6	0	4	3	14
7-Nov	0	8	0	3	0	11
8-Nov	0	2	0	1	2	5
9-Nov	0	0	0	0	0	0
						170

While the number of lost man-shifts (historically unavailable labour) 'saved' as a result of this exercise was hardly significant overall, the exercise pointed to the attempt by trade unionists to ensure the success of the agreement. The labour time 'saved' in this manner amounted to around 1 360 man hours. The unionists were particularly proud of this initiative, for this impacted directly on assuaging some of the frustration of their worker constituencies. It represented a rare engagement of mass-based trade unionists to involve themselves directly in production issues, measured of course in labour time.

9.8.3 The Section Manager's 'War Rooms'

The general mine manager introduced an important initiative of his own at this point, bringing in the underground supervisory chain of command directly under senior PGM management control. This involved daily meetings in the Section Manager's office, dedicated to ensuring closer supervision[326] and reporting of a variety of factors relating to

[326] Close supervision is generally associated with policing the intensity of labour, i.e. making workers work *harder*. Here, in the context of significant worker autonomy at the point of

production. This can be analysed in a number of ways, yet its impact was a decisive component of the success of the increased face advances that took place over the months of September to December 2005. During these early morning meetings, Mine Overseers, one by one, gave detailed reports; HR personnel were present in order to respond especially to reported issues such as absenteeism and reasons for labour shortages. Underground, at the waiting places, the charts designed to track face advance, lost blasts and related measures were found not to have been consistently applied or regularly completed. Not all personnel, including one instance at Shift Overseer level, were sufficiently familiar with the process, which permitted more careful monitoring of the underground stoping environment than previously possible. This shift overseer glumly admitted to knowing that 'they' - the managers - were now focusing on face advance. An older man, his entire being bespoke the strain of long-ingrained, dispirited fatigue. For this underground line supervisor, this was yet another task to perform, and his lacklustre approach stood in marked contrast to the keen decisions the task team had been taking in the boardroom on surface. Failure to communicate to every individual in this industrial army of over 2 500 remains a function of complex organisations generally, but is of critical import, particularly in the extensive underground workings of a mine shaft. The worker representatives on the task team did not, however, integrate themselves into these daily meetings as envisaged at a certain point; this proved to be a weakness of the overall strategy adopted to implement the terms of the key Memorandum.

What follows precisely squares with an analysis of how South African trade unions are required to face the transition, from militant mobilisation to an engagement with the realities of a considerably more complex democratic society, if real material gains for workers are to be made. For as Sakhela Buhlungu had argued a few years before:

> Unions do not have the skills to engage in complex discussions about shop-floor issues, let alone broader economic and political issues. With many companies embarking on restructuring, particularly on the shop-floor, the need for union

production, it related to ensuring the necessary materials and equipment to expedite efficient production and the overcoming of its manifold obstacles, i.e. intensifying work, but by making work *easier*.

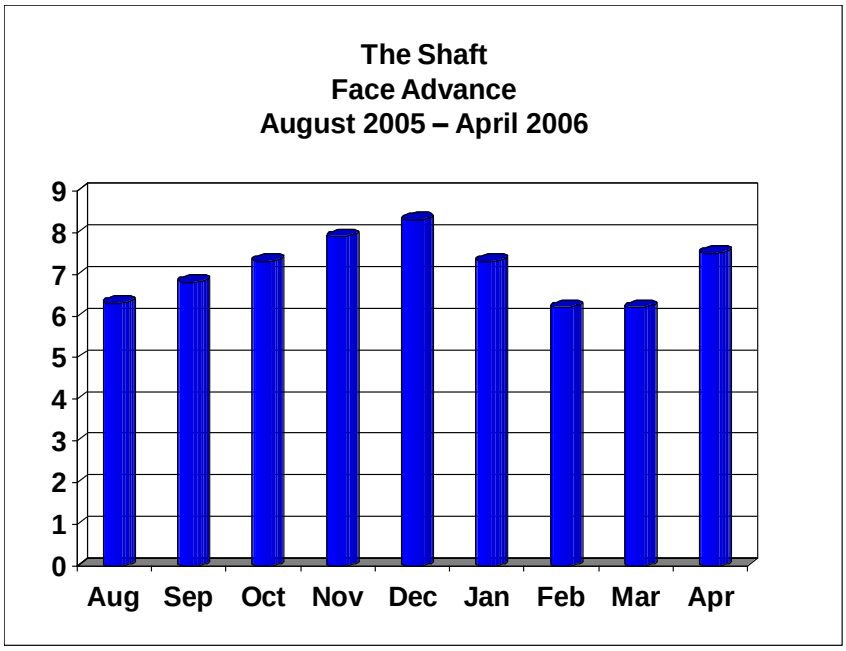
> engagement is likely to become greater…. The shop stewards' committee and the members' general meeting were very effective in the era of resistance, but they were never geared to deal with production issues. This weakness was exposed when management came up with new initiatives which required workers and shop stewards to take a clear stand on issues such as productivity and the need to become globally competitive (2000: 83).

Despite the exercise being in the direct interest of a powerful though fractious constituency, The Shaft task team felt compelled to engage, and often did so somewhat reluctantly and only partially, in the process; yet this process did show results, as indicated in the section that follows.

9.9 Achieving and assessing improved face advances

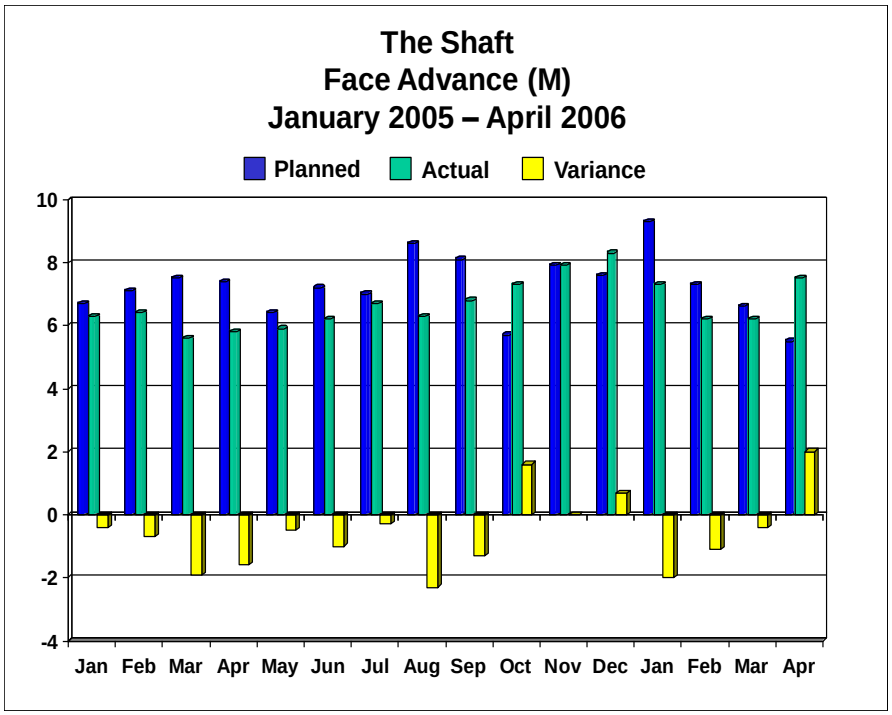
Face advances improved significantly due to the collective efforts of the key parties: the machine operators themselves, the daily 'War Room' meetings at 7am in the Section Manager's office and even the limited underground visits of the task team dedicated to investigating trouble spots at the stope faces. These crucial developments led to the reinstatement of the machine operators' old wage rates prior to the strike on 25th November the previous year.

The bar chart below very clearly indicates the extent to which face advances improved over the four months from September to December 2005 after the inception of the face advance productivity deal on 20 August.



This improvement off the base of current production needs, however, to be examined in relation to the planned targets set. The reasons for the drop from January 2006, quite apart from the natural rhythm of a drop at the beginning of any new year, are dealt with in the next section.

An increase over and above existing mine plan targets needed to be reached in terms of the Memorandum. The bar-chart below, capturing face advances from the beginning of 2005 through to the official, though premature, end of the facilitation process, provides this picture.



The requirement of the first 'milestone', that the face advance increase by ½ metre above target (mine plan) for two consecutive months, was not met. The planned target for September was 8,1m and the actual 6,8m, giving a negative variance of 1.3m; the planned target for October was 5,7m and 7,3m was achieved, resulting in a positive variance of 1,6m. This gave a 0,3m gain overall for the first two months instead of the required 1m. In November, the actual face advance met the planned target of 7,9m, resulting in an overall shortfall of 1,5m for the three months. December's efforts were rewarded with 8,3m actual advance, 0,7 m above the planned target of 7,6m, yet still 1,3m short over the four months despite a steady rise from 6,8 to 7,3 to 7,9 to 8,3m from September to December.[327]

Despite not having met the new negotiated targets as agreed, the General Manager saw fit to reward the efforts and improvements off the base line, and the wages of the machine operators were re-instated as from 1 September. This was recognition indeed. At this

[327] If a comparison can be made with face advances in gold mining, in 1987 Frost cited an advance of 6,1m per month as 'the conventional mining rate' (1987: 32). Face advances vary, Frost going on to cite work from the Technical Advice Group (1986: 10) of 6,4m at Vaal Reefs and 8,43m at Western Deep Levels (1987: 36).

point the machine operators urged themselves on to even greater efforts to win back the wages lost from the time of the strike in December of the previous year to 31 August. But despite their efforts, as will be seen, management had not forgotten that the political power struggle had yet to be won to their satisfaction.

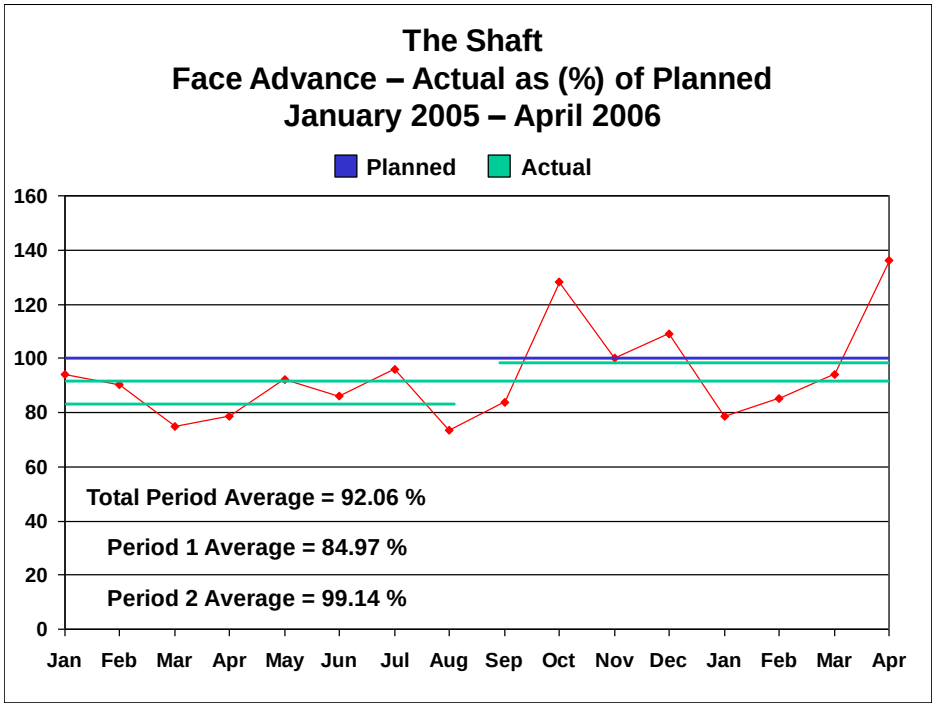
It is instructive to note that for the first time in 2005, the planned target is exceeded in October and met exactly in November. This significant achievement possibly contributed to the decision to award the re-instatement, despite an overall negative variance of 1,3m over the four months September to December 2005. In December 2005 1,7m above target was achieved; this dipped again until 2m face advance above target was again achieved in April 2006.

A further instructive point to note in the table below is a comparison between the first eight months of the year (Jan-Aug 2005) and the eight months (Sept 2005-Apr 2006) after the new planned targets were attempted.

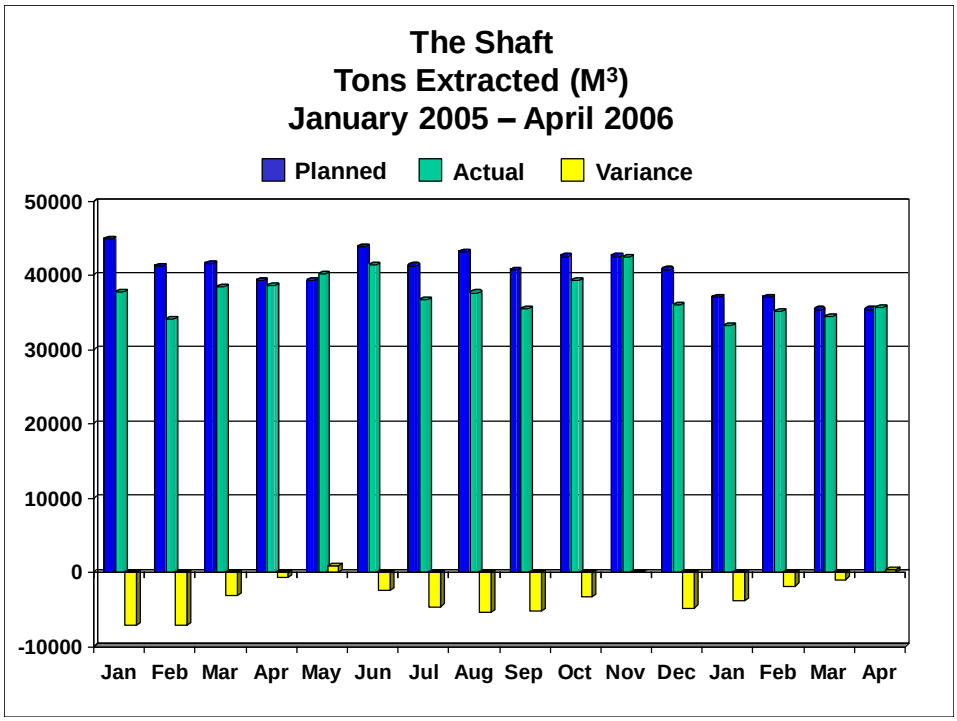
Period	Planned (m)	Actual (m)	Variance (m)	% Realised
jan	6.7	6.3	-0.4	94.03%
feb	7.1	6.4	-0.7	90.14%
mar	7.5	5.6	-1.9	74.67%
apr	7.4	5.8	-1.6	78.38%
may	6.4	5.9	-0.5	92.19%
jun	7.2	6.2	-1.0	86.11%
jul	7.0	6.7	-0.3	95.71%
aug	8.6	6.3	-2.3	73.26%
jan-aug 05	**57.9**	**49.2**	**-8.7**	**84.97%**
sep	8.1	6.8	-1.3	83.95%
oct	5.7	7.3	1.6	128.07%
nov	7.9	7.9	0.0	100.00%
dec	7.6	8.3	0.7	109.21%
jan	9.3	7.3	-2.0	78.49%
feb	7.3	6.2	-1.1	84.93%
mar	6.6	6.2	-0.4	93.94%
april	5.5	7.5	2.0	136.36%
sep-apr 06	**58.0**	**57.5**	**-0.5**	**99.14%**
jan 05-apr 06	**115.9**	**106.7**	**-9.2**	**92.06%**

Data culled from information provided by the Surveying Department

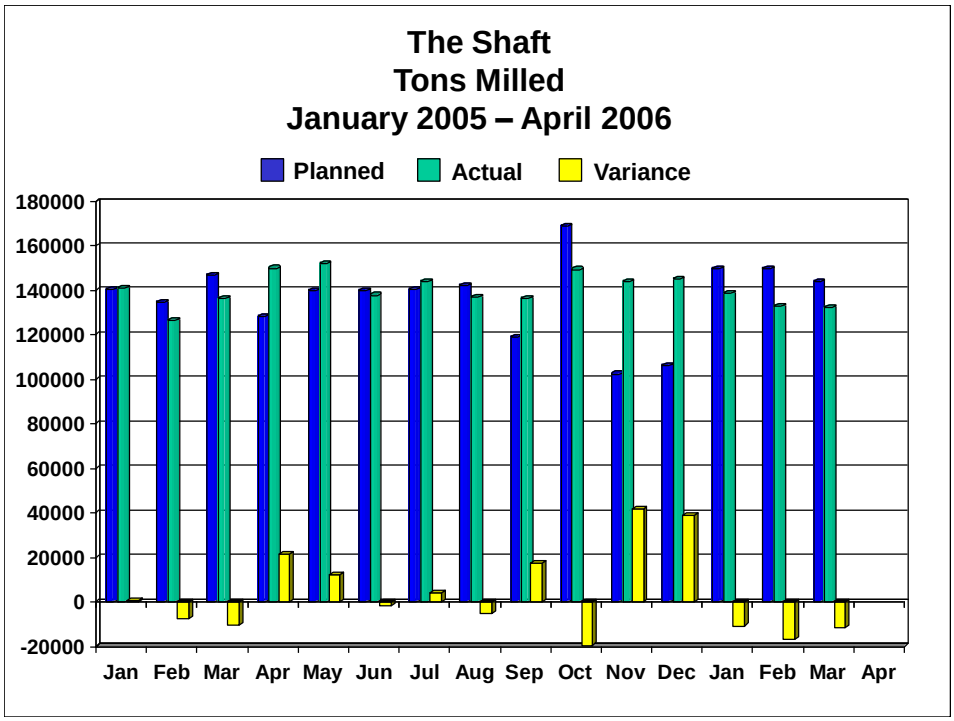
These figures are graphically displayed in the following chart; they not only point to the considerable improvement sustained over the eight months from the beginning of the project, but suggest that measures ought to have been adopted to sustain this improvement in order to ensure that the benefits accrued to everyone on The Shaft, the non-striking workers and supervisors in particular.



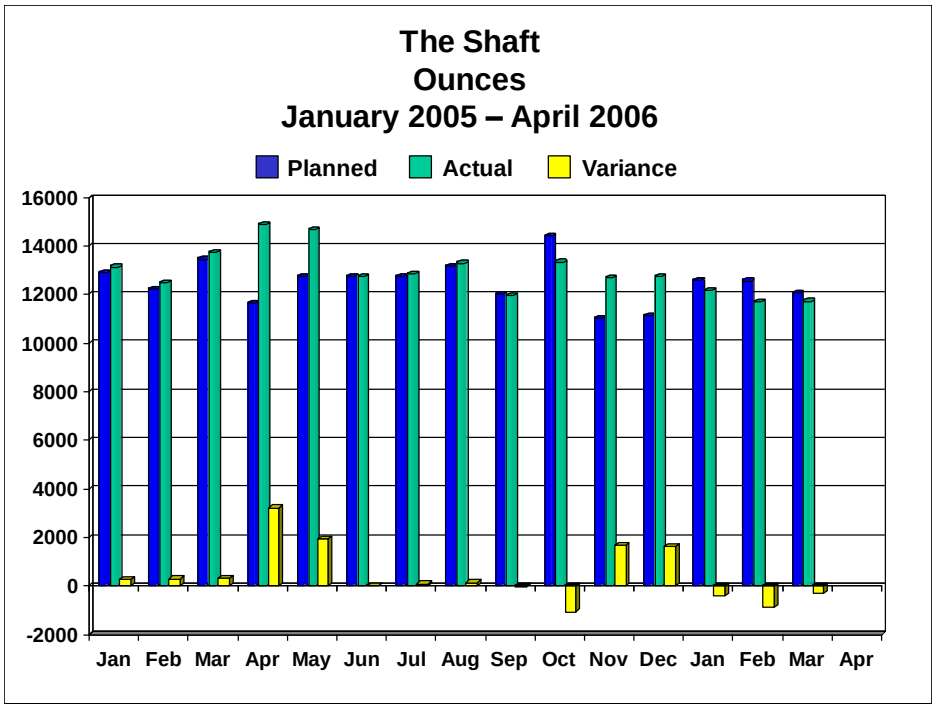
The increased performance of 14% overall marks a significant and sustained improvement over the eight months beginning with the face-advance deal, despite the negotiated target not being met.



In the chart above, the planned and actual (m^3) mined, reflective of the performance of The Shaft as a whole, reveals a slightly different picture. For calculations in mining are always amenable to different measures and perspectives. It is important insofar as it also shows an increase in performance, when the first eight months (Jan 2005-Aug 2005) are compared to the months after the new targets were set (Sept 2005-Apr 2006). While less marked than the increase in face advance, measured as an average percentage of tons extracted, the first period boasts 91,1% of target reached while the second period rises slightly to 93,7%, reflective again of a sustained increase in overall performance of The Shaft.



When it comes to tons milled, further down the line in the production process in the refinery, the picture above changes again, as there is a positive and hugely significant 52 293 tons milled *above target.* Calculations here are, however, not necessarily due solely to the task team's initiative. The figures could be due to ore ('stof' - unrefined ore) in gullies having been cleaned or the frowned-on practice of revealing 'back pocket' tons (drawing from stock piles), or to a combination of two or three such practices production managers employ to meet the overall targets of a shaft. Any canny miner leaves ore in his gullies to haul out when he has not met his production targets for the month, but to ensure he gets his production bonus nevertheless. This is simply part of the art and craft of mining. In this instance stockpiles were drawn on by the most seasoned of all the miners, namely the managers, the reasons for which were not established.



The crucial measure in mining of its final product is ounces of refined precious metal. In the chart above, regarding ounces of refined platinum, results are similar to those for tons milled, 6 767 ounces in excess of target for the period under review. The unverified explanation for this was higher grades of reef mined than forecast and noted on mine plans.

The overall effect was that The Shaft mining community remained a stalwart collective producer. Within the terms of overall productivity at PGM, their 'socially necessary labour time' was lower than the average. In September 2005, for instance, The Shaft was the only shaft at PGM to meet all its production targets. The regional Human Resources manager thanked the task team for their efforts on behalf of the mine manager and the General Manager, and noted that the second milestone now required attention. At a task team meeting later, both senior managers specially attended and expressed their appreciation of the efforts made. This was as far as the project was to go.

No agreement regarding the second milestone was signed off as intended by all parties in the task team. The reason for this failure was that which lay at the heart of the machine

operators' history and struggle around changing conditions of work, namely the machine operators' job description.

9.10 The machine operators' job description

A key point in the Memorandum submitted to the General Manager, born of the requirement to approach facilitation in an integrated manner and address certain key issues, reads as follows:

> The machine operators are provided with copies of their job descriptions and agree: To work according to job description. This is not currently occurring. This applies especially in stoping sections and particularly with regard to:
>
> Assisting/erecting temporary support
> Lashing the footwall at stope face
> Sludging out shot holes ('piping')
> Removal of temporary support
>
> To thereby actively re-establish team-work relations with panel and other workers.

While these elements are clearly officially part of the rock drill operators' job, the men were implacably sticking to doing one thing only: drilling shot holes.[328] At the point at which the second milestone was to be formally set down, these matters relating to the job description of the machine operators' proved a decisive impediment to effectively continuing with the terms of the second Memorandum. The union members in the task team at this point considered this to be a matter to be dealt with beyond local shaft-level discussions. In addition, the administrative matter of ensuring that the reinstated wages were implemented, was receiving the greater part of the attention of certain members of the task team.

Facilitation did not succeed in persuading the task team to actively grapple with this matter on The Shaft and it was referred to the combined management-union partnership forum. However, it was not tabled at that forum, but became implicated in the broader

[328] The issue is an old one. An argument against machine drillers nearly a century before was that unlike hand-drillers, machine drillers did not lash or clean their own stopes.

issue across PGM regarding a new job grading system well beyond the jurisdiction of the task team.

More importantly, however, no-one was prepared to face off against the machine operators, who clearly had, over time, won the practice of defining their own job as strictly drilling the rock face. Assisting and or erecting temporary support was the timber-man's job. Lashing the footwall, a wearisome task, was a job for the cleaning night shift; sludging out the shot holes was the miner's assistant's job; and removal of temporary support was generally done by the timber-men. The *de facto* power of the machine operators at the point of production had enabled them to slough off aspects of their job to other underground workers - thereby impacting on the social relations between them and those who had long since taken over parts of their job.[329]

The work of the task team at The Shaft, the facilitation process and the successful completion of the terms of the second Memorandum, effectively stalled. It remains to conclude this chapter by pointing to factors in the mining production labour process that affect face advance.

9.11 Factors influencing face advance increases

The above analysis of significant sustained performance improvements over the eight months, from the time the negotiated targets were set, attests to the success of what an integrated set of actions by critical players on The Shaft managed to achieve. The achievement of increased face advances had evoked a considerable degree of renewed confidence on The Shaft. That the two leadership groups - the line managers and the union task team members - would each privately claim responsibility for this achievement is perhaps both important and not important.

[329] As Moodie states regarding the transition from hand to machine drilling a century ago, 'one of the strongest arguments for hand drilling was that hammer workers lashed their own stopes for up to two hours to clear the face prior to beginning work' (1994:51). It is not clear why lashing had remained part of these rock drill operators' job description, suggesting a history of its own around this issue and which clearly has temporal implications, as well as implications for employment and social relations in production to boot.

It is not important insofar as these improvements were recorded, irrespective of who believes which party was most crucially responsible. It is, however, important insofar as the efforts of the trade unionists and supervisors were at least temporarily aligned. It is to this alignment that the partial success of the attempt to reach new negotiated targets can potentially be attributed. The daily 'War Room' meetings, which have been sustained, were singularly important in this regard.

Nevertheless, exactly who, what and how each of the supervisory and task team groups contributed to what senior management noted as a 'positive' intervention, is impossible to measure. The point is that the actions of each leadership group resulted in a measure of success in achieving improvements in productive performance: the hard edge of antagonistic social relations on The Shaft was somewhat blunted by paying attention to worker control at the point of production. This section, however, points to weaknesses, and to a number of areas where stronger emphasis could have been placed and where improvements could have been made.

9.11.1 Momentum not sustained

The degree of energy put into the seven weeks of underground visits and reporting by members of the task team was not sustained. It was agreed that the responsibility for this weakness resided in the design of the project and lay chiefly with shaft HR managers directly involved and the facilitator.

9.11.2 Management commitments

A series of activities - future business plan reviews, a general audit, a business and organisational restructuring exercise and a labour reduction exercise at the end of the year - to name a few key events - prevented a fuller measure of attention being devoted to what became known as 'the machine operators task team'.

9.11.3 Labour reduction exercise

In order to ensure the success of the perennial concern within the ever cost-sensitive mining industry and as an exercise in benchmarking costs per ton against those of a

competing corporate miner, a labour reduction exercise took place over December 2005. While this has not been quantified in terms of its potential impact on the task team's work, it is instructive to note that the beginning of 2006 saw a *reduced* personnel complement on The Shaft and January 2006 correspondingly did not prove to be a good production month.

Any labour reduction exercise involves the re-organisation of work and while this was not investigated, this inevitably impacted on the achievement of the targets which, as noted, dipped in the first three months of the year before achieving the desired results for the month of April 2006, a mere 0,5 meter short of mine plan target for the preceding eight months. The machine operators were gradually hauling in the overall target, but did not have the opportunity to continue and make up for the wages they lost from the time of reinstatement and the restoration of their original wage rates.

9.11.4 Causes of sub-optimal mining

As the task team began its regular visits underground and the face advance improved, significant differences of opinions as how best to achieve the new targets emerged. Competing views were expressed by supervisory personnel and union men, as to the root cause of problems, dysfunctions and blockages in production scenarios. These issues, germane to mining generally, occupy some space here.

9.11.4.1 Absenteeism

Absenteeism is undeniably the major structural cause and primary reason for not being able to consistently meet production targets. Despite a recent company-wide investigation and due to factors beyond the immediate control of PGM, absenteeism remains a major problem. When reasons for high absentee rates are discussed, union and staff association representatives, for instance, consistently pointed to the queues especially at the Teba Bank in Rustenburg as a reason for employees taking days off to get paid.

A group-wide study on absenteeism had indicated that while the number of employees being paid in the different groups at the Teba Bank at the hostel near The Shaft is relatively evenly spread, concerns regarding a particular pay group, where queues requiring service were alleged to have stretched past normal banking trading hours, this was investigated, but did not yield conclusive results as to the magnitude of the stated problem.

When seen in the context of PGM as a whole, the sheer number of people moving through the Teba bank in Rustenburg gives substance to employee representatives concerns. The photographic collage below attests to long periods of waiting regularly experienced by mineworkers in the region far beyond those employed by PGM.

TEBA Bank Rustenburg
Circa April 2006



As the task team attempted to grapple with this problem, particularly as it came into focus as a factor potentially jeopardising the achievement of the terms of the key Memorandum, some union representatives approached the machine operators to highlight absenteeism and encouraged individual responsibility to improve work attendance.

From the data base for ‘Un-availables’ - historically unavailable labour time - on The Shaft, a table was drawn up noting the average percentages of absenteeism for The Shaft as a whole and the machine operators separately. The period covered the eleven months both before and the eight months after the start of the face advance project, i.e from October 2004-April 2006. The objective was to ascertain whether the task team members’ attempts at encouraging greater individual attendance at work had yielded results. While this proved not to have been the case, the exercise provided other surprising results.

Staff turnover was not taken into consideration on a month-by-month basis. Instead global figures of overall average strengths of general employees and machine operators were used on the basis that the workforce had been stable throughout the period, barring the labour reduction in December and the engagement of over one hundred machine operators in April 2006. The number of 450 machine operators and 2650 mine complement strength were used. The final percentages are consequently not absolutely precise, yet represent a reasonably accurate picture over the nineteen-month period for which data was readily available.

The most significant proportion of absenteeism in the ‘unavailables’ category is training - roughly 1,5% and official leave - roughly 6,5% and have been grouped into the category ‘Other’. This was to isolate the categories of absent without permission (AWOP) and the ever problematic category of sick leave.

What is particularly instructive is that machine operators, as an occupational group, displayed lower rates of absenteeism overall over both periods under review. Machine operators displayed lower both AWOP rates and sick leave rates when compared to the rest of The Shaft. The category ‘Other’ jumped during the two periods for the machine operators as their overdue leave was negotiated, rostered and leave taking began.

All categories of 'un-availables', among both the workforce in general and the machine operator group, showed a surprising increase in the second period after the face advance project was implemented. Arguably, harder, more intensive work was responsible for the increase in days workers took off as both Gouldner (1964) and Burawoy (1972) have showed in other mining contexts.

		Unavailables – The Shaft					
		General		RDO			
Period	**Type**	Absentees	Rate	Absentees	Rate	Total	Average
Oct 04 - Aug 05	AWOP	**3199**	**0.47%**	**320**	**0.28%**	**3519**	**0.38%**
	Other	**6790**	**6.24%**	**463**	**1.60%**	**7253**	**3.92%**
	Sick Leave	**5386**	**2.56%**	**629**	**1.55%**	**6015**	**2.06%**
	Total	**15375**	**9.27%**	**1412**	**3.43%**	**16787**	**6.35%**
Sept 05 – Apr 06	AWOP	**3231**	**0.66%**	**412**	**0.50%**	**3643**	**0.58%**
	Other	**7562**	**9.03%**	**1285**	**8.96%**	**8847**	**9.00%**
	Sick Leave	**5429**	**3.45%**	**933**	**3.41%**	**6362**	**3.43%**
	Total	**16222**	**13.14%**	**2630**	**12.87%**	**18852**	**13.01%**

9.11.4.2 Lack of material supplies

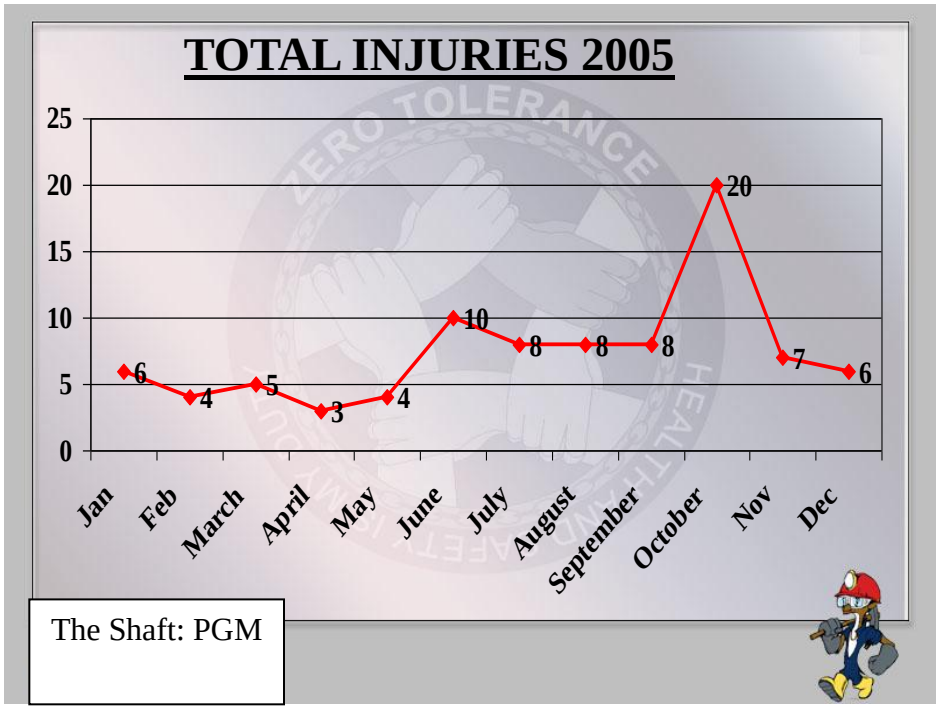
Union representatives continually brought this issue to the table of the task team. The provision of the right materials, to the right faces, at the right time, remains a perennial challenge to underground mining and is a major issue for underground personnel at the face considerably broader than both the experience of The Shaft and platinum mining. The reports of the task team attest to the occurrence of this phenomenon for which this thesis has provided ample evidence and relevant references in the literature. The experience of The Shaft during the project simply underlines this fact.

In the reports submitted after the underground visits to various mining sections, just under half (18 out of 33) note the problem of material shortages of various kinds. When this occurs, the traditional and historically entrenched response has been to improvise, or instruct that improvisation (*planisa*) strategies, be adopted. This practice remains general in underground mining operations, thereby compromising standing orders and safety and remains a key challenge to be met and systematically treated. A range of reasons are given

for material supply shortages, other than where unforeseen events occur. Unforeseen events are, however, endemic to mining and hence remain a significant component of the challenge of material supply chain management. The reasons for material shortages underground are regularly and well-rehearsed in mining, yet worthy of repetition: availability beyond the shaft, stores opening and closing times synchronisation, poor planning and supervision of budgetary controls, wastage underground and individual neglect, to name a few. That materials underground are not in 'abundant supply', particularly in the context of cost-cutting exercises, was acknowledged by a leading supervisory manager on The Shaft.

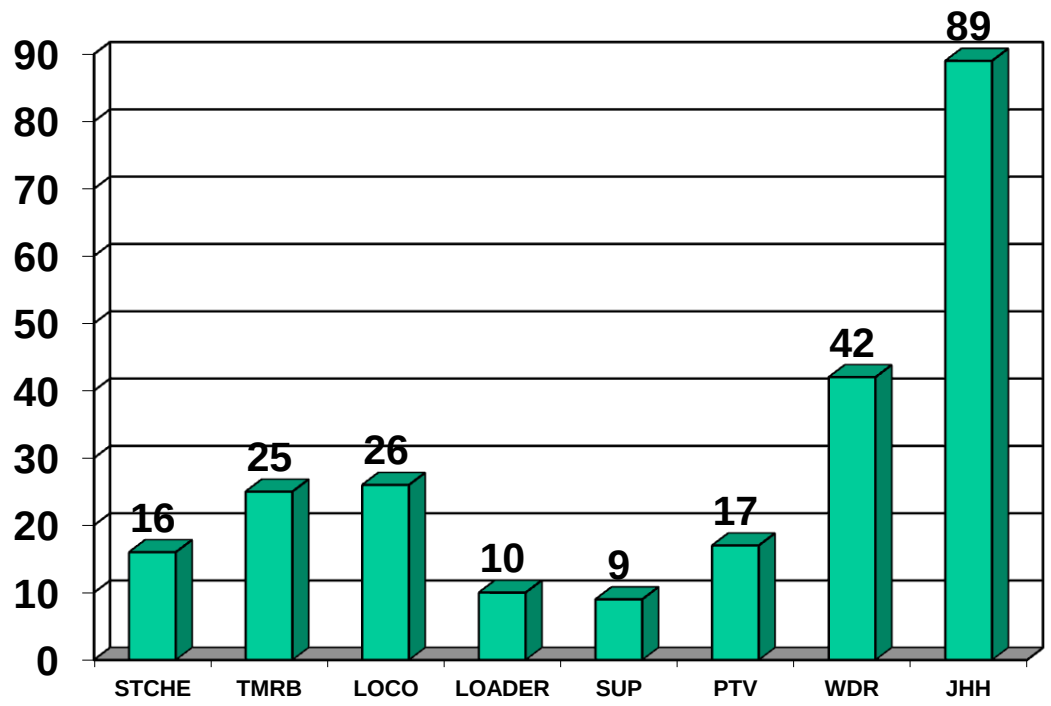
9.11.4.3 Increase in injuries

The success of the first stage of the face advance project coincided with an increase in injuries as the face advance project took place at The Shaft. This flags the critical importance of safety, particularly when productivity initiatives are undertaken. While the increase in total injuries in the month of October was corrected and returned to its level at the beginning of the year, it is important to note that the occurrence corresponded with a significant increase in the face advance project.



Courtesy of the Safety Department

Those who suffered these injuries can be readily identified. Unsurprisingly, the machine operators suffered, by a considerable margin, the highest number of injuries overall as depicted in the following chart.



Legend:

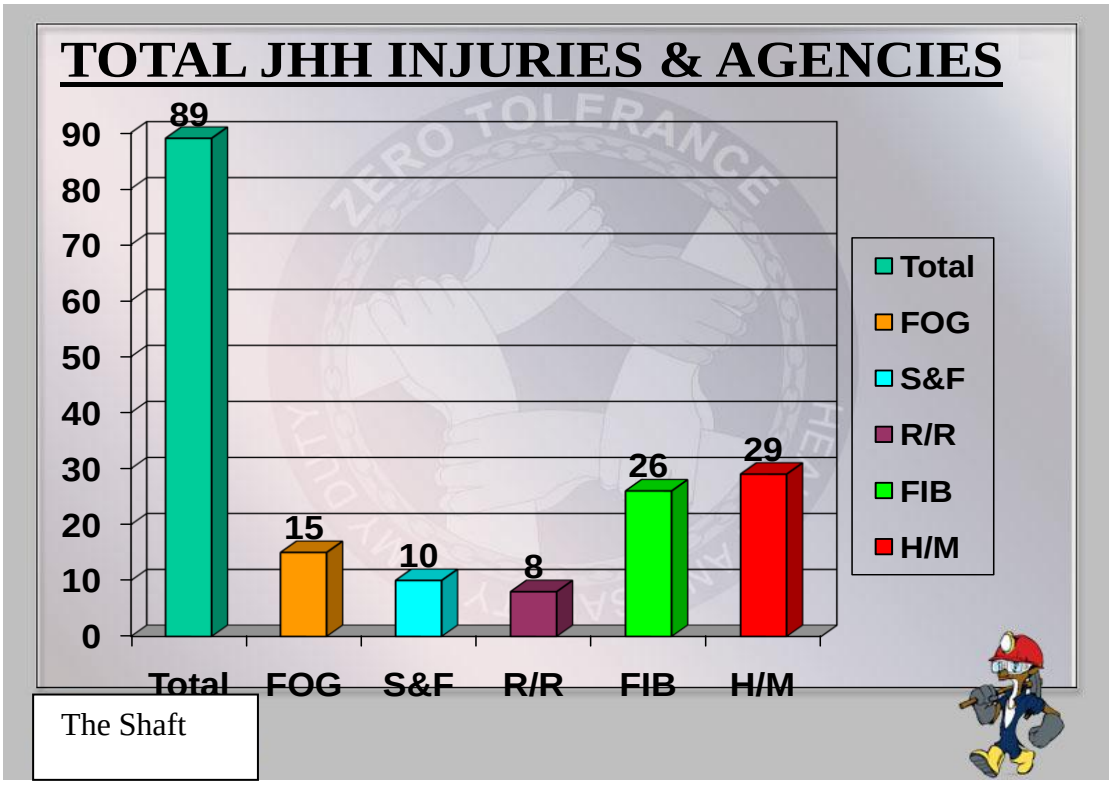
STCHE - Stope crews, Haulage and Engineering
TMRB - Timber men
LOCO - Locomotive drivers
SUP - Supervisors
PTV - Pipe, Track and Ventilation
WDR - Winch Drivers
JHH - Jack Hammer Hands

When these figures for the number of injuries suffered by the machine operators (the category JHH - i.e jack hammer hands) are broken down into their causes, it is evident that a significant number of the injuries are agency induced, but structurally framed. Bluntly stated, the machine operators, as a group, hurt themselves more than usual in their quest to win back their lost wages. The legend for the chart below notes these causes.

It is perhaps important to note the assumption that, seismic events aside, falls of ground are attributed to human agency on the basis that, where mine support is installed according to mine standard procedures and practices, falls of ground are minimised. The problem of this, of course, is that miners stretch these standards when there is a lack of mine timber support materials.

When the number of injuries are analysed as to their causes, it is interesting to note that it is not the traditional major cause of injury and fatality underground which is the cause of the majority of injuries in this instance, namely falls of ground. It is materials and equipment handling and most importantly foreign bodies in the eye, an injury prevented by utilising the standard piece of equipment in the PPE package - protective goggles. Despite the discomfort and inconvenience of wearing goggles in a humid and water-borne atmosphere, this preventable injury requires more focussed attention if injury rates are to be brought down.

The chart below illustrates the preponderance of this particular preventable injury.



Courtesy of the Safety Department

Legend:

FOG - Falls of Ground
S&F - Slip and Fall
R/R - Rolling Rock
FIB - Foreign in Body (Eye Injury)
H/M - Handling Materials

Available information did not permit assessment of the injury rate among machine operators during the course of the face advance project beyond the general observation that a spike occurred in the graph shortly after the project got underway.

9.12 Conclusion

In 2004, the machine operators went out on strike three times as they struggled to force their legal right to take badly overdue annual leave. Management had not listened to them, neither had any of the trade unions taken them seriously. Social relations had deteriorated badly. Prior to their strikes, the machine operators had first resuscitated their own organic and informal worker committees on The Shaft and had embarked on symbolic protests at the gates of the mine. Then they began closing off their drills exactly eight hours after they had clocked in at the crush, only to go and wait at the shaft stations for the hoist to take them to surface at the normal time. Production at The Shaft was not only continued throughout, but was of the best at PGM. None of these strategies afforded them the relief they sought. Arguably, they held the moral high ground. Due to their illegal strikes, management held the opposite view.

The machine operators not only lost the moral high ground if they did indeed occupy it, but any support they may have had from their fellow workers during their third strike, once having taken to violence. Within their own ranks they enforced their strike law by holding celebratory cultural feasts, funded by fines paid by recalcitrant members for having dissented with what were either genuine majority decisions or the dictates of a powerful demagogic leader, who clearly had refused to let go of a two-decade old struggle in which he was personally involved. Whatever the case, there is no doubt as to the display of the machine operators' remarkable collective organisational discipline. Once dismissed and rehired under the threat of final dismissal, their representatives in the task team failed them yet again. They then turned to tactical options by having found a bureaucratic loophole, threatening to all take leave simultaneously and to which they were legally entitled.

An outside party crafted a way out of the impasse in which the whole Shaft found itself, the impasse being related directly to the objective power at the point of production exercised by the machine operator occupational group. But this required of them not only to cease using their labour time as a weapon to reduce the length of the working day, but which required the intensification of their direct labour time, the only capacity left to them. They proved themselves up to the task, only to be denied the opportunity of pushing their struggle, to win all of their lost wages, to its logical conclusion. Production was no longer the issue, but power. The restoration of managerial disciplinary power trumped the possibility of additional surplus value creation. Normality had been restored and working lives continued much as before.

In terms of a value-theoretic analysis, the machine operators' strategic position as creators of surplus value constituted the material basis for their actions. No other single occupational group on The Shaft - or on any mine for that matter - would have been capable of waging the struggle they did. Firstly, their very position in production fostered the creation of the machine operators committees: a charismatic leader having revealed their objective power to them. They subsequently took time out to organise and re-establish their organic working class organisation, albeit only on The Shaft and not across PGM. Astute management took appropriate evasive action to prevent further mobilisation of these committees. Secondly, the machine operators embarked on symbolic protest action, but opted for a tactical retreat, on more than one occasion, once faced with the mine manager's threat to fire them. Thirdly, they then sought to increase the value of their labour power by increasing socially necessary labour time (and consequently decrease the surplus extracted from the expenditure of their labour power) by struggling over the length of the working day - that component relating to class struggle over the labor process. This resulted in more unperformed surplus labour on The Shaft. Finally they went out on strike for a third time, resulting in a tranche of historically unavailable surplus labour they would have to make up to restore the consequences of the strike and a condition of their re-employment - lost wages, the epiphenomenal expression of labour time. Not only this, the machine operators deprived the supervisors of an important portion of redistributed surplus value - their lost Christmas bonuses.

The wages the machine operators lost eroded the historical and moral component of their wage, pushing their struggle back to one over physical subsistence, a struggle characterising much of the twelve decades of mine-working labour in South Africa, the struggle, in other words, over what constitutes the physiologically minimum necessary labour to ensure the reproduction of labour power under mining conditions in different periods of time.

During the face advance productivity project, workers were seeking to re-establish the traditional historical and moral component of their wage and they assumed a degree of institutionally sanctioned control at the point of production in order to do so. They were seeking, to continue applying Wright's schema, to restore the wage corresponding to socially average necessary labour, a very specific numerical individual wage known *practically* by each and every machine operator.

In terms of socially necessary labour time, however, the 450 rock drill operators, by intensifying their labouring efforts, as well as the additional engineering capacity of the compressors installed on the bank, this amounted to increasing relative surplus value by both mechanised and non-mechanised means. This, however, at one and the same time, impacted on this group of workers insofar as they were simultaneously contributing to *decreasing* socially necessary labour time and hence the value of their labour-power. Recall that socially necessary labour time is a shifting average only calculable at any 'given moment' under specific conditions. In fact, the neighbouring mining competitor's workers were working at lower average costs. By this group of workers decreasing socially necessary labour time they were, in effect, *ceteris paribus*, coming up to par with their more productive working class compatriots who were, as a comparable group of mineworkers, producing greater value by virtue of working at lower cost and whose socially average necessary labour - as their contribution to the overall scheme of things - was consequently lower.

The face advance project was an important moment for the machine operators. For they stood to lose the earnings of their entire careers, having been reduced to working at the

wage rate of a novice. In essence they were fighting the rock to win back their lost wage rates and hurt themselves in a process into which they clearly threw themselves with unbridled gusto, for the sake of their very careers as miners, represented by the sum total of their life's labour time expenditure.

In facilitating the process an intellectually radical academic (myself) got inexorably drawn into the complex *realpolitik* of capital's power and the machine operators' struggle within which theory is seriously challenged in the light of every-day practicalities. This but all too vividly reveals the complexity of engaging in actual struggles over the value of labour time. It proved to be a salutary and sobering lesson: *contra* Burawoy, it is *safer* to propound ideas above the heads of those whom such ideas are intended to serve than to try and serve them, but contribute to actually hurting them. In a qualitatively different register, as a fellow sociologist observed after a single obligatory visit to the rock face: *'This is not the stuff for the fainthearted'* (James 1992:27).

Postscript.

It remains to be seen how the current situation - where 5000 rock drill operators on a platinum mine were dismissed after their strike was declared illegal by order of court and were required to re-apply for their jobs the next day - will play itself out (The Star, Business Report, 24 & 25 January 2012).

10 Conclusion

> *Gold mining, properly so called, is, like other mining, an art requiring the employment of capital, and of a skill only to be acquired by years of experience. There is no art practised by civilised men which requires for its full development the application of so many sciences and collateral arts.*
> Karl Marx *Grundrisse* (1977:178-9)

If it was insufficiently explicit in what was written above, the fundamental point of this thesis is that labour-time, as the measure of (appropriated) surplus value - the difference between what it takes to reproduce the direct producers and the net value produced - is the key determinant of exploitation and that the struggle over exploitation is primarily rooted in production. The structuring of labour time, moreover, powerfully impacts the society which is sustained by its expenditure. Any analysis of modern contemporary capitalist society consequently needs to take labour-time expended in production into account.

In the instance under examination here, the *retention* of mine labour, as measured by labour time for over a century, is the primary and foundational factor accounting for the sustained economic existence of the South African mining industry. This both completes and extends the received wisdom in the revisionist literature that the industry was predicated on a low-wage migrant labour regime.

Labour time is central to production and implicates it's both technical and social aspects, as well as issuing in social change and transformation beyond the mining workplace. By changing working time arrangements, social effects proliferate in all directions. This view, in part at least, explains the sustained reluctance of the industry to alter working time: there only being three significant changes to industrial working time since 1911: one of which merely reconfigured the number of hours worked, one of which was short lived while the last, the BCEA in 1997 did not change the hours many workers spent underground. In addition, the rare changes to working time in the last century, considered more generally if the labour contract is included, occurred only when the industry faced a

profitability crisis, was forced to either retain or attract labour (especially labour time worn skills), were compelled to do so by virtue of white labour's collective struggles or by legislative *fiat*. Labour time otherwise remained remarkably stable and provided a solid foundation for surplus value extraction throughout its entire history, through to the present. By way of supporting these claims, this concluding chapter recapitulates the substance of this thesis and draws a broader conclusion on the basis of its evidence and argument. Historically, labour policy in the gold mining industry in South Africa was remarkably stable. This thesis presented evidence that this applied especially to working time arrangements. I argued that this applied equally to platinum mining and may well prove to be more widely applicable to South African mining, which was, for the better part of its life organised under the direct hegemony of the Chamber of Mines of South Africa. While the stability of working time had been noted, the phenomenon had not been explained. This thesis set out to provide such an explanation by using the concept of labour time.

The concept of labour time had long been long jettisoned by neo-classical economics and was then completely dismantled as a concept. It had surprisingly also been largely ignored in Marxist scholarship as a topic worthy of sustained investigation in any substantive sense. Exploring labour time, *qua* both concept and social phenomenon in a specific historical and contemporary social conjuncture, with specific reference to Eric Olin Wright's only attempt at a value-theoretic analysis of the length of the working day - still-born thirty years ago - provided, I have both argued and attempted to show, a fruitful avenue to follow in the quest for an adequate social explanation for the stability of working time arrangements in South African gold mining and beyond. The object of the study, the magnitude of labour time expended since the inception of gold mining, is, to boot, quantifiably definable, making it an ideal candidate for social scientific analysis.

In Chapter one I outlined what emerged as a general argument that while the scholarly tradition had focused on the industry's sustained historic challenge to *acquire* its labour supply, it had overlooked the maintenance, in production, of a stable working time regime central to the *retention* of labour.

In gold mining, the importance of a stable, relatively long labour time regime was framed by and remains due primarily to the mining of low-grade ore at depths going down to 4 000m, as well as (I have endeavoured to show), stalled mechanisation at the rock face. This required relatively long working hours and which the industry sought to lengthen overall. The unstated preference of the platinum mining industry to implement continuous working time schedules simply serves to confirm the point and further signals the importance of labour time as a current issue.

The use of various methodologies employed over a decade - ethnographic and other qualitative data gathering instruments, both secondary and primary documentary sources and a large-scale quantitative survey - was defended in Chapter two as an exercise in methodological triangulation representing sound methodological practice as opposed to having being decided on *a priori*. It was rather predicated on actual research experience in the industry spanning twenty years considerably more broadly than the ambit this thesis covered. Methodologically, the project was consequently characterised as one of learning, practical research and active engagement in the mining industry itself,

The key theoretical question addressed in Chapter three is why the concept of labour time - the measure of value in Marxist theory - had, until relatively recently, largely been ignored. Time, I suggested, had generally been uncritically construed as linear and its measure construed as a purely quantitative magnitude. This was only partly remedied by tracking the concept - with special emphasis on 'socially necessary labour time'- through the recently renewed controversy in Marxist value theory. Labour time, I argued and tried to show on the basis of the evidence presented, is revealed as the archetypal, socially constructing principle of social life. This was shown, *inter alia*, by adopting and applying the insight of Moishe Postone on the question of labour time, that the *quantitative* magnitude of labour time expenditure has *qualitative* social effects.

By these lights, the key empirical question was why a 48 hour working week had not appreciably changed since the Mines and Works Act of 1911 - a full century ago. What was the significance of this fact?
Chapters four and five presented the historical evidence for this fact drawn primarily from the secondary literature.

By way of providing the key empirical evidence for the thesis, Chapter four (by no means systematically) tracked industrial working time (hours, weeks and months). These traditional measures of labour time were periodised into 'the early years' until 1910, 'the years of stability' from 1911 to 1990 and 'the contemporary period of transition' since 1991. The evidence shows that working hours were a perennial feature of the generally occluded industrial politics of management and labour organisations internal to the mining industry.

Chapter five introduced a new measure of labour time expenditure. This measure was not an analytical abstraction, but rather simply articulated a moment of the African Miners' and Allied Workers Union submission to an early apartheid-government Commission. The AMWU construed labour time as constituted by the length of the migrant labour contract (the number of 'tickets' or shifts) which - following the paradigm case of Mozambique - progressively lengthened, until industrial working time and the length of the contract coincided, this co-incidence, the precise dating and reasons for which could well do with further inquiry. This process, which laid to rest the officially State-facilitated migrant labour system as such, laid the material basis (exemplifying the foundational, socially constructive role of labour time) for an instance in the non-racial unity of institutionally organised labour in the struggle for reduced working hours and the contemporary restructuring of labour time. The very expenditure of labour time is consequently, I argued, shown to be a pre-eminently *social* process born in struggles at the point of production where *value* is created.

The stability of industrial time and the progressive lengthening of labour contracts was mining capital's manner of overcoming the impediments to its continued accumulation

as it was unable to mechanise production at the rock face. Mining capital had consequently to rely on modes of absolute surplus value extraction via primarily maintaining the length of the working day and minimising costs, this being chiefly the sustained assault on wages under production conditions of a unique physical ecology of the Witwatersrand gold reef and the fixed, then often dramatically fluctuating price of its commodity.

Labour time consequently provides the fundamental basis and necessary condition for the accumulation of mining capital. To ensure the continuation of accumulation and economic survival, effectively no reduction of hours across almost a century was possible. On this basis, given the unique economic market conditions of gold where profitability depends on lowering production costs,[332] the economic struggle for capital for profitable production was waged on two fronts - against a harsh natural geological environment and the struggles of labour around wages, reduced working hours and resistance to long labour contracts. The matter of wages and how they were 'subsidised' by the countryside had absorbed the bulk of the attention in the literature to the detriment of a focus on the temporal basis upon which mining was founded at a very fundamental level.

Gold capital hence laid down a foundation for standardising working hours in the earliest stage of its development before the development of hand-held machine drills in its labour process, 1899 and 1907 being significant dates in this regard. In 1903 this was a working day of 9 ½ hours, with travelling and waiting underground making it anything from an absolute minimum 10 ½ to fifteen hour working day 'bank-to-bank'. Time spent underground remains the *sine qua non* in mining. Even though at this early stage, prior to 1930 when machine drills were generalised due to the introduction of the mechanised scraper[333], this major technological development representing the single

[332] See the paper by Bernd Grewe (2007).

[333] See Moodie with Ndatshe (1994) and Hovis and Mouat (1996:339ff) for the account in the American context where the transition from hand to machine drilling also stretched over an extended period, from 1887 until 1910.

most important advance since hand drilling and the single most important shift in relative surplus value extraction - at least as far as rock-breaking in the stopes is concerned.

More broadly, what has for long been clear is that the capitalist mode of production articulated with a pre-capitalist mode resulting in incomplete proletarianisation. This widely held perspective is born from a political economy focussing on the labour supply side of the equation, not one embedded in the heart of capitalist production centred on the underground labour process. From *this* perspective, and that of the 'long service Africans' in the early years especially, proletarianisation has long been complete, yet unstable with an urbanised, regimented and compounded subaltern proletariat under the direct control of capital down to the minutia of everyday life from early on and is a function of the length of time spent at work, particularly underground. This proletariat is very largely of capital and the State's making and remaking, the cases of South African novices and a new kind of worker coming into the industry in the mid-1970's and the sub-contracted workers being two cases in point.

What is clear from these two chapters is that the remarkable stability for almost a century of both industrial time and the labour contract and its fierce and successfully sustained defence by mining capital further begged explanation. Why *was* working time so stable? The short answer is that neither the price of gold, nor the labour supply was under the direct control of mining capital. Working time, however, *was* and is under the direct control of mining capital and constituted the foundation for ensuring the survival of gold mining over the entirety of its life, for some time now considered to be in its twilight.[334]

[334] That is unless the Deepmine project is resuscitated - which is technically and theoretically feasible and is again (2011) being considered as an option by Anglo Gold - for as much gold lies beneath the ground below 3500m than has been excavated over the last twelve decades! (see Webster *et al* 1999)

Chapter six explains the main point that labour time is fundamentally socially constructive as clearly as possible by its treating of Eric Olin Wright's analytical value-theoretic decomposition of the working day. Wright's schema was applied to and modified in the light of examining the mining labour process. Given the evidence presented, it is imminently plausible to have argued that value creation in mining was and remains founded on what Marx conceptualised as an absolute surplus value extraction regime predicated particularly on extended periods of labour time expenditure, the various temporal dimensions of which, I analysed, following Wright, as resulting in particular forms of class struggle.

The account presented in this thesis is, unapologetically, a thoroughly productivist one, but not, I argued, a 'vulgar' economism. The extent of its ambit regarding social explanation generally is up for intellectual grabs. This assertion but expresses the bold claim made that this study of labour time is of a programmatic character and but merely opens up a potentially productive line of social inquiry with manifold ramifications. How long and hard people collectively work, and how labour time is structured in working time regimes, stated here in short quick terms, fundamentally structures and defines the society in which they live and their life chances within it.

Referring (all too episodically) to the literature, my evidentially-based social scientific argument, I indicated, potentially sheds further explanatory light and the need for more research on the scholarly work of Dunbar Moodie on the 'maximum average system'; on Jean-Paul Leger's work on 'tacit knowledge' and on Andries Bezuidenhout and Bridget Kenny's work on sub-contracted labour. My argument questions how a focus on labour time can contribute to revisiting debates around the labour process, *inter alia*, on mining in the work of Martin Legassick and Michael Burawoy and manufacturing in studies by Edward Webster and many others inspired by his school of thought, Andries Bezuidenhout and Karl von Holdt in particular.

Labour time - of which wages are merely the social expression - thus emerges as foundational in showing how surplus value is extracted in the mining labour process. In

the analysis presented, the duration of labour time was shown to be directly responsible for intra-working class occupational differentiation and central to the racial division of labour. It showed how the value of the labour-power of African workers assumed priority over the cost of white (organised) labour. It also intimated, I maintain, how the expenditure of labour time contributed powerfully to social class formation. Restructuring labour time is, on the evidence presented and was shown in this thesis to be immured in complexity.

Chapter seven detailed aspects of the complexity the mining industry faced by documenting attempts to restructure working time since 1991. For when labour time is restructured, mining capital sought (and still seeks) to lengthen the labour time of the labour force (collective or abstract labour) as a whole and must confront (at its cost) its detrimental social effects. This is a socially *retrogressive* development. Organised labour, on the other hand, sought to shorten working hours. Under the constraints of capitalist profitability this struggle reduced to one where workers' organisations tried to maximise net surplus-value-producing labour time and had the quality and productivity of labour time expended in the labour process as its focus. This is a socially *progressive* development. This is despite the paradox that workers must, perforce, continually produce at a rate below what is socially necessary in order to produce a surplus for capital to ensure the basic requirements for survival, let alone to create a historically and morally - i.e socially - necessary component to their wage.

To illustrate this contention, two on-site studies, where the researcher became part of those who fell under the ambit of the practical research project (Chapter eight) and active engagement (Chapter nine), these two chapters related in some detail contemporary struggles to reduce working hours and do so productively for the common weal.

In the case of the rock drill operators discussed in Chapter nine, on South African mines, the productive forces have now, in the contemporary period, arguably long matured and run up against the 'fetters' which characterise the contradiction between such forces and their social relations (Bottomore 1983). For any previous coercive utility the hand-held rock drill technology might have possessed has, a century later, turned into a powerful

instrument of worker control over the production process. The organisational shape and collective attitude of the occupational group of rock drill operators, who also work some of the longest hours, is consequently in some sense, much like the hand-held rock drill is reminiscent of a pre-industrial age, the last vestige of a much earlier industrial mass-based proletarian worker.

It is no accident that here, where the value chain in the mining production and labour process begins, contestation is and has historically been at its most fierce. But while the mining industry has had some room for manoeuvre over the value of labour in relation to wages as it sought the measure of socially necessary labour, it is the struggle over working time at the point of production in particular which establishes the rate of the extraction of surplus and over which the industry has consequently been compelled to maintain its long held hegemonic status. In this context and with labour-time at the centre, the story of class relations becomes infused with the dynamism of social relationships with 'the extraction of surplus at the point of production at the very heart of it', which is how at least one theorist contends, the concept of class ought to be conceived (Carter 1995:62).

Both of these contemporary studies reveal the complexity of restructuring labour time. This has implications for the practice of social science engaged in this process. The outcome of the social scientific engagement did not contribute to altering the pattern labour time had assumed in the previous century, but merely recapitulated the contours of previous struggles between capital and labour over working time arrangements.

I end this work simply by way of two concluding comments and questions emerging from what has been argued for and shown above. Firstly, practically speaking, for the prospect of a more civilised society to emerge where all share in the wealth which is created by socially necessary labour, the origin of which has been, I maintain, shown in two key instances - gold and platinum mining in South Africa. Both of these extractive industries remain central to the fortunes of our contemporary globalised world and in which - working hours must be reduced, both to address the social and production demands of

workers and to meaningfully tackle the critical matter of safety and the numbers of fatalities which have historically bedevilled the South African mining industry. The role social science should play in active engagement in industrial society - an instance of which this thesis detailed - and by implication within society in general, remains an open question.

Secondly, if viable and productive ways of working, which workers have managed to implement, are not explored and more adequately rewarded beyond the basic costs of the reproduction of labour, wasted mining communities, such as are imminent in gold mining (unless it does become financially viable to go down to 5km) will recur in platinum in the future. Are working class and other subaltern communities around the gold and platinum mines to suffer the same plight as those who spent their lives and working time in the largely forgotten asbestos fields of a mere few decades ago? (McCulloch 2002, 2003; Stewart 2007b)

11 Bibliography

Adler G (Ed) 2001 *Working Time: Towards a 40-hour week in South Africa*, National Labour and Economic Development Institute (NALEDI), Johannesburg

Adler T 1991 *Sleep for Sale: a study of shift work in South Africa*, University of the Witwatersrand Press, Johannesburg

Agency for Industrial Mission 1976 *Another Blanket: Report on an investigation into the migrant situation*, Agency for Industrial Mission, Horison, Transvaal

Agency for Industrial Mission 1984 *With Dirty Shoes*, AIM Migrant Labour Seminar, Agency for Industrial Mission, Horison, Transvaal

Agency for Industrial Mission 1986 *Investigation into the Migrant Labour Situation*, (Prepared by Paul Stewart in conjunction with Nontobeko Mofokeng and Miriam Altman), Horison, Transvaal

Albritton R 2004 'Theorising Capital's Deep Structure and the Transformation of Capitalism', *Historical Materialism*, Vol 12, No 3:73-92

Alexander P 2001(a) 'Race, Class loyalty and the Structure of Capitalism: Coal miners in Alabama and the Transvaal, 1918-22', The Burden of Race? "Whiteness and 'Blackness' in Modern South Africa, *History Workshop and Wits Institute for Social and Economic Research (WISER)*, 5-8 July

Alexander P 2001(b) 'Oscillating Migrants, 'Detribalised Families' and Militancy: Mozambicans on Witbank Collieries, 1918-1927', *Journal of Southern African Studies*, Vol 27, No 3:505-525

Alexander P 2002 'Patterns in Protest: A Preliminary Analysis of Strikes by Black Miners in the Transvaal, 1925-1950', *Center for Sociological Research Seminar Paper*, Rand Afrikaans University, Johannesburg

Alexander P	2006 'Harold and History, Engaging silences and unresolved issues in the political economy of South Africa', *Harold Wolpe Memorial Trust Tenth Anniversary Colloquium*, 21-23 September
Alexander P	2008 'Challenging cheap-labour theory: Natal and Transvaal coal miners, ca 1890-1950', *Labor History*, Vol 49, No No1:47-70
Allen VL	1991 *The history of black Mineworkers in South Africa:* Vol I, Moor Press, Keighley, Great Britain
Allen VL	2003(a) *The history of black Mineworkers in South Africa*: Vol II, Moor Press, Keighley, Great Britain
Allen VL	2003(b) *The history of black Mineworkers in South Africa*: Vol III, Moor Press, Keighley, Great Britain
Anonymous	2005 *Cultures of Safety: Participatory Safety on Anglo Mines*, Confidential Report, Wits Enterprise, University of the Witwatersrand, Johannesburg
Antonsen S	2009 *Safety Culture: Theory, Method and Improvement*, Ashgate Publishing Limited, Farnham, England
Arthur CJ	1994 'Moishe Postone: Time, Labor and Social Domination', *Capital and Class*, No 54:150-155
Arthur CJ	2001 'Value, Labour and Negativity', *Capital and Class*, No 73:15-39
Arthur CJ	2003 'Value and negativity: A reply to Carchedi', *Capital and Class*, No 82:17-82
Arthur CJ	2004 'Subject and Counter-Subject', *Historical Materialism*, volume 13, No 3:93-102
Ashworth G, Dias B, MacPhail C, Makaluma H, Molapo M Molefe N, Motala M, Phakathi TT, Schutte PC, Schutte PS, Stewart P & Webster E	2003(a) 'Audit and diagnostic assessment of productivity in continuous miner sections', Coaltech 2020, Task 7.1, Final Report, *Council for Scientific and Industrial Research*, Johannesburg
Ashworth G, Dias B, MacPhail	

C, Makaluma H, Molapo M Molefe N, Motala M, Phakathi, TT, Schutte PC, Schutte PS, Stewart P & Webster E 2003(b) 'Audit of the work and living environment, Futuremine' Task 6.5.1, Final Report, *Council for Scientific and Industrial Research*, Johannesburg

Aufheben 2007 'Capital beyond class struggle?' Review: Time, labour and social domination Moishe Postone (Cambridge University Press, 1996; first published 1993) http://libcom.org/library/review-moishe-postone-capital-beyond-class-struggle, 30-52

Babbie E & Mouton J 2001 *The practice of social research*, Oxford University Press, Cape Town

Baker A, Roach G, Ferguson S & Dawson D 2004 'Shiftwork experience and the value of time', *Ergonomics*, Vol 47, No 3:307-317

Bandyopadhyay P 1981 'Critique of Wright: 2. In Defence of a Post-Sraffian Approach', *The Value Controversy*, Steedman I (Ed) Verso, London

Barber WJ 1977 *A History of Economic Thought*, Penguin Books, Harmondsworth

Barker F 1998 'Wage Initiatives in Mining: A new mould for Industrial Relations?' Fulco and Innovative Working Arrangements Colloquium, *The South African Institute of Mining and Metallurgy*, Johannesburg

Baskin J 1991 *Striking Back: a History of COSATU*, Ravan Press, Johannesburg

Baskin J 2000 'Labour in South Africa's Transition to Democracy: Concertation in a Third World Setting', *Trade Unions and Democratisation in South Africa, 1985-1997*, Adler G and Webster, E (Eds), Witwatersrand University Press, Johannesburg

Bates R 1971 *Unions, Parties and Political Development*, Yale University Press, New Haven and London

Beinart W 1980 'Labour Migrancy and Rural Production: Pondoland c 1900-1950', Mayer P (Ed) *Black Villagers*

in an Industrial Society: Anthropological perspectives on labour migration in South Africa, Oxford University Press, Cape Town

Bell E — 2001 'The Social Time of Organisational Payment Systems' in *Time and Society*, Vol 10:45-62

Bellofiore R & Finelli R — 1998 'Capital, Labour and Time: The Marxian Monetary Labour Theory of Labour as a Theory of Exploitation', *Marxian Economics: A Reappraisal - Essays on Volume III of Capital - Volume I: Method, Value and Money*, MacMillan Press, London

Bellofiore R — 2009 'A ghost turning into a vampire', *Re-reading Marx*, Bellofiore W & Fenischi R (Eds), Palgrave, London

Benson M — 1998 'Implications of 12 Hour Workdays for Workplace Safety: Driver Safety and Machine Operation', The 12 Hour Day: Emerging Issues, Working Paper No 51, Heiler K (Ed), *Australian Centre for Industrial Relations and Training* (ACIRRT), University of Sydney

Benya AP — 2009 *Women in Mining: A Challenge to the Occupational Culture in Mines*, MA thesis, University of the Witwatersrand, Johannesburg

Benya AP — 2010 'If you don't hear the bell, you're mince: Women's story of mining underground', *South African Labour Bulletin*, Vol 33, No 5:7-9

Berg M (Ed) — 1979 *Technology and Toil in Nineteenth Century Britain*, CSE Books, Humanities Press, London

Berg P, Appelbaum E, Bailey T, & Kalleberg AL — 2004 'Contesting Time: International comparisons of employee control of working time', *Industrial and Labor Relations Review*, Vol 57, No 3:331-349

Berger J & Mohr J — 1975 *A Seventh Man*, Penguin, Harmondsworth

Bezuidenhout A — 1999 'Restore Profitability or We Pull the Trigger: The Politics of Productivity in the South African Gold Mining Industry in the 1990's', *South African Sociological Association*, Saldanha Bay, South Africa

Bezuidenhout A — 2004 *Post-colonial workplace regimes in the white goods manufacturing industries of South Africa, Swaziland and Zimbabwe*, PhD Thesis, University of the Witwatersrand, Johannesburg

Bezuidenhout A — 2005 'Post-colonial Workplace Regimes in the Engineering Industry in South Africa', *Beyond the Apartheid Workplace: Studies in Transition*, Webster E & von Holdt K (Eds), University of KwaZulu-Natal Press, Durban

Bezuidenhout A — 2006 'Mining Externalisation in South Africa under Apartheid', *Sociology of Work Unit*, University of the Witwatersrand

Bezuidenhout A & Buhlungu S — 2006 'Old victories, new struggles: the state of the National Union of Mineworkers', Buhlungu S, Daniel J, Lutchmann B & Southall R (Eds) *The State of the Nation*, 2006-2007, HSRC Press, Pretoria

Bezuidenhout A & Kenny B — 1999 'Contracting, complexity and control: An overview of the changing nature of subcontracting in the South African mining industry', *The Journal of The South African Institute of Mining and Metallurgy*, Vol 99, No 4:185-191

Biewener C — 1998 'Socially Contingent Value', *Marxian Economics: A Reappraisal: Essays on Volume III of Capital: Volume 2: Profits, Prices and Dynamics*, MacMillan Press, London

Blyton P, Hassard J, Hill S & Starkey K — 1979 *Time, Work and Organisation*, Routledge, London and New York

Blyton P — 1991 'Book Reviews: Judith Buber Agassi and Stephen Heycock (Eds.): The Redesign of Working Time: Promise or Threat? 1989, Berlin: Sigma, 325 pages', *Organisation Studies*, Vol 12:461-463

Boca I — 2008 'A Note on Antonio Negri's Break with the Ontology of Time', *Time and Society*, Vol 17:135-150

Bonefeld W — 2001 'The permanence of Primitive Accumulation: Commodity Fetishism and Social Constitution', *The*

Commoner: a web journal for other values, http://www.thecommoner.org

Bonefeld W — 2004 'On Postone's Courageous but Unsuccessful Attempt to Banish the Class Antagonism from the Critique of Political Economy', *Historical Materialism*, Vol 12, No 3:103-124

Bonefeld W — 2010 'Abstract labour: Against its nature and on its time', Capital & Class, 34(2)257-276

Bonner PL — 1979(a) *Working Papers in Southern African Studies* (Ed) African Studies Institute, University of the Witwatersrand, Johannesburg

Bonner PL — 1979(b) 'The 1920 Black Mineworkers Strike: a Preliminary Account', Bozzoli B (Ed), *Labour, Townships and Protest*, Ravan Press, Johannesburg

Bonner PL — 1995 'African Urbanisation on the Rand in Southern Africa' in *Journal of Southern African Studies*, Vol 21, No 1: 115-129

Bonner PL — 2004 'The Great Migration' and The Greatest Trek': Some Reflections', *Journal of Southern African Studies*, Vol 30, No 1:87-114

Bonner P, Delius P & Posel D — 1993 *Apartheid's Genesis, 1935-1962*, Ravan Press, Johannesburg

Bonner PL & Shapiro KA — 1993 'Company Town, Company Estate: Pilgrim's Rest, 1910-1932' in *Southern Africa in Journal of Southern African Studies*, Vol 19, No 2:171-200

Bonner PL & Stewart PF — 2007 *The re-discovery of gold and new discoveries of precious metals in the modern period*, Unpublished paper

Booth W — 1991 'Economies of Time: On the Idea of Time in Marx's Political Economy', *Political Theory*, Vol 19, No 1:7-27

Bourdieu P — 1998 *Practical Reason*, Polity Press, Cambridge

Bottomore T (Ed) — 1983 *A Dictionary of Marxist Thought*, Blackwell, Oxford

Bozzoli B	1981 *The political nature of a ruling class: Capital and Ideology in South Africa 1890-1933*, Routledge & Kegan Paul, Boston and Henley, London
Braverman H	1974 *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*, Monthly Review Press, New York and London
Breckenridge K	1998 (a)'We must speak for ourselves: The Rise and Fall of a Public Sphere on the South African Gold Mines, 1920 to 1931', *Comparative Studies in Society and History*, Vol 40, No 1:71-108
Breckenridge K	1998(b) The Allure of Violence: Men, Race and Masculinity on the South African Goldmines, 1900-1950, *Journal of Southern African Studies*, Vol 24, No 4:669-693
Brown A	2008 'A materialist development of some recent contributions to the labour theory of value', *Cambridge Journal of Economics*, Vol 32:125-146
Buhlungu S	2000 'Trade Union Organisation and Capacity in the 1990's: Continuities, Changes and Challenges for PPWAWU', *Trade Unions and Democratisation in South Africa, 1985-1997*, Adler G and Webster E (Eds) Witwatersrand University Press, Johannesburg,
Buhlungu S & Bezuidenhout A	2008 'Union Solidarity under Stress: The Case of the National Union of Mineworkers in South Africa', *Labor Studies Journal*, Vol 33, No 3:1-26
Burawoy M	1972(a) *The Colour of Class on the Copper Mines: From African Advancement to Zambianization*, Manchester University Press, Manchester
Burawoy M	1972(b) 'Another look at the mineworker', *African Social Research*, Vol 14:239-287
Burawoy M	1979 *Manufacturing Consent*: *Changes in the Labour Process under Monopoly Capitalism*, The University of Chicago Press, Chicago and London
Burawoy M	1981 'The Capitalist State in South Africa: Marxist and Sociological perspectives on race and class', *Political Power and Social Theory*, Vol 2:279-335

Burawoy M — 1985 *The Politics of Production: Factory Regimes Under Capitalism and Socialism*, Verso, London

Burawoy M — 1987 'The Limits of Wright's Analytical Marxism', *Berkeley Journal of Sociology*, Vol 32:51-72

Burawoy M — 1995 'Mythological Individualism - The Metaphysical Foundation of Analytical Marxism', *Rational Choice Marxism*, Carver T & Thomas P (Eds), MacMillan, London

Burawoy M — 1997 'The Extended Case Method', *Occasional Paper No 10, Dept of Sociology*, University of the Witwatersrand, Johannesburg

Burawoy M — 1998 'The Extended Case Method', *Sociological Theory*, Vol 16, No 1:4-33

Burawoy M — 2003(a) 'For a Sociological Marxism: The Complementary Convergence of Antonio Gramsci and Karl Polyani', *Politics & Society*, Vol 31, No 2:193-261

Burawoy M — 2003(b) 'Revisits: An outline of a theory of reflexive ethnography', *American Sociological Review*, Vol 68, October: 645-679

Burke RJ (Ed.) — 2006 *Research companion to Working Time and Work Addiction*, Edgar Elgar, Cheltenham, UK

Burkett P — 2000 'Natural, social, and political limits to work time', *Working Time: International trends, theory and policy perspectives*, Golden L and Figart DM (Eds), Routledge, London and New York

Callinicos L — 1980 *A people's History of South Africa, Volume 1, Gold and Workers: 1886-1924*, Ravan Press, Johannesburg

Callinicos L — 1994 'The compound system', *Work and Industrialisation in South Africa*, Webster E, Alfred A, Bethlehem L, Joffe A & Selikow T (Eds), Ravan Press, Randburg

Campbell — 2001 ''Going Underground and Going After Women': Masculinity and HIV transmission amongst Black Workers on the Gold Mines', Morrell (Ed) *Changing*

Men in Southern Africa, University of Natal Press, Pietermaritzburg & Zed Books, London & New York

Carter B — 1995 'A Growing Divide: Marxist Class Analysis and the Labour Process', *Capital and Class*, No 55:33-72

Cartwright A — 1962 *The Gold Miners*, Purnell & Sons, Johannesburg

Catephores G — 1989 *An Introduction to Marxist Economics*, MacMillan, Houndmills, Basingstoke

Chamber of Mines — 1978 'Eleven Shift Fortnight/Five Day Week: Final Report', *Gold Project Team*, Hollard Street, Johannesburg

Christiansen RE & Kyd JG — 1983 'The return of Malawian labour from South Africa and Zimbabwe', *The Journal of Modern African Studies*, Vol 21, No 2:311-326

Clawson D — 1980 *Bureaucracy and the Labor Process: The transformation of U.S. Industry, 1860-1920*, Monthly Review Press, New York and London

Cobbe J — 1995 'Macroeconomic statistical evidence from Lesotho', *Crossing Boundaries: Mine Migrancy in a democratic South Africa*, Crush J & James W (Eds), Institute for Democracy in South Africa, Rondebosch

Cockshott P, Cottrell A & Michaelson G — 1995 'Testing Marx: Some new results from UK data', *Capital & Class*, No 55:103-129

Cockshott P & Cottrell AF — 1997 'Labour time versus alternative value bases: a research note', *Cambridge Journal of Economics*, Vol 21:545-549

Cooper AD — 1999 'The Institutionalisation of Contract Labour in Namibia', *Journal of Southern African Studies*, Vol 25, No 1:121-138

Costa DL — 2000 'The Wage and the Length of the Work Day: From the 1890's to 1991', *Journal of Labor Economics*, Vol 18, No 1:156-181

Cressey P & Mc Innes J — 1980 'Voting for Ford: Industrial Democracy and the Control of Labour', *Capital and Class*, No 11:5-33

Crush J — 1989 'Migrancy and Militance: The Case of the National Union of Mineworkers of South Africa', *African Affairs*, Vol 88, No 350:5-23

Crush J — 1992(a) 'Power and Surveillance on the South African Gold Mines in Southern Africa', *Journal of Southern African Studies*, Vol 18, No 4: 825-844

Crush J — 1992(b) 'Inflexible Migrancy: New Forms of Migrant Labour on the South African Gold Mines', *Labour, Capital and Society*, Vol 25, No1:46-71

Crush J — 1994 'Scripting the Compound: power and space in the South African mining industry', *Environment and Planning D: Society and Space*, Vol 12:301-324

Crush J, Jeeves AH & Yudelman D — 1991 *South Africa's labour Empire: A History of Black Migrancy to the Gold Mines*, Westview Press, Boulder and David Philip, Cape Town

Crush J & James W (Eds) — 1995 *Crossing Boundaries: Mine Migrancy in a democratic South Africa*, Institute for Democracy in South Africa (IDASA), Rondebosch

Crush J, Ulicki T, Tseane T & Jansen van Veuren E — 2001 'Undermining Labour: The Rise of Sub-contracting in the South African Mines', *Journal of Southern African Studies*, Vol 27, No:5-31

Dal Rosso S — 2002 'Working Time and in Brazil, Past Experience and Recent Changes', *Time & Society*, Vol 11, No 1: 67-86

Davies RH — 1979 *Capital, State and White Labour in South Africa, 1900-1960: An historical materialist Analysis of Class Formation and Class Relations,* The Harvester Press, Brighton

Davies R & Head J — 1995 'The Future of Mine Migrancy in the Context of Broader Trends in Migration in Southern Africa', *Journal of Southern African Studies*, Vol 21, No 3: 439-450

De Angelis M — 1995 'Beyond the Technical and the Social Paradigms: A Political Reading of Abstract Labour as the Substance of Value', *Capital & Class*, No 57: 107-133

De Angelis M — 2001 'Marx and primitive accumulation: The continuous character of capital's "enclosures"', *The Commoner*: a web journal for other values, http://www.thecommoner.org

Debord G — 1994 [1967] *The Society of the Spectacle*, (Translated by Nicholson-Smith D), Zone Books, New York

Deepmine 1998-2002 — Undated *The Deepmine Collaborative Research Programme*, Chamber of Mines, THRIP and CSIR: Miningtek, www.deepmine.co.za, Auckland Park, Republic of South Africa

Dembe AE, Erickson JB, Delbos RG & Banks SM — 2005 'The impact of overtime and long working hours on occupational injuries and illnesses: new evidence from the United States', *Occupational Environmental Medicine*, Vol 62:588-597

Department of Minerals and Energy (DME) — 2000 'Guideline for the Compilation of a Mandatory Code of Practice on Minimum Standards of Fitness to Perform Work on a Mine', *Mine Health and Safety Inspectorate*, South Africa

Devine J — 1989 'What is 'simple labour'? A re-examination of the value-creating capacity of skilled labour', *Capital & Class*, No 39:113-131

de Vletter F — 1981 'Conditions affecting black migrant workers in South Africa: A case study of the gold-mines', *Black Migration to South Africa, A Selection of Policy-oriented research*, Bohning WR (Ed), International Labour Office, Geneva

de Vletter F, Doran MH, Low ARC, Prinz FD & Rosen-Prinz BD — 1981 'Labour Migration in Swaziland', *Black Migration to South Africa, A Selection of Policy-oriented research*, Bohning WR (Ed), International Labour Office, Geneva

de Vletter F — 1987 'Foreign labour on the South African gold mines: New insights on an old problem', *International Labour Review*, Vol 126, No 2:199-218

De Vries P — 1977 'What are Black mineworkers saying about their experiences on mines?' *Human Resources Monitor*, Bulletin 3.11, Chamber of Mines, Johannesburg

de Vroey M — 1982 'On the Obsolescence of the Marxian Theory of Value', *Capital & Class*, No 17:34-59

Dicks KV — 1982 A follow-up on Integrated Stoping at Vaal Reefs, *Association of Mine Managers of South Africa: Papers and Discussions*, 1980-1, Chamber of Mines, Johannesburg

Dimoulis D & Milios J — 2004 'Commodity Fetishism vs. Capital Fetishism Marxist Interpretations vis-`a-vis Marx's Analyses in *Capital*', *Historical Materialism*, Vol 12, No 3:3-42

Doane MA — 2002 *The Emergence of Cinematic Time: Modernity, Contingency and the Archive*, Harvard University Press, Cambridge, Massachusetts and London, England

Dubow S — 2000 *The African National Congress*, Jonathan Ball Publishers, Johannesburg

Dunne P (Ed) — 1991 *Quantitative Marxism*, Polity Press, Cambridge

Edwards P & Belanger J — 2008 'Generalising from Workplace Ethnographies: From Induction to Theory', *Journal of Contemporary Ethnography*, Vol 37:291-313

Edwards R — 1979 *Contested Terrain: The Transformation of the Workplace in the Twentieth Century*, New York, Basic Books

Eldred M & Hanlon M — 1981 'Reconstructing Value-Form Analysis', *Capital & Class*, 1981, No 13:24-60

Elson D — 1979 'The Value Theory of Labour', *Value: The Representation of Labour in Capitalism*, Elson D (Ed), Humanity Press, London

Facarello G — 'Some Reflections on Marx's Theory of Value', *Marxian Economics: A Reappraisal - Essays on Volume III of Capital - Volume I: Method, Value and Money*, MacMillan Press, London

Fine B — 1975 *Marx's Capital,* The MacMillan Press Ltd, London and Basingstoke

Fine B — 1990 *The Coal Question: Political economy and Industrial Change from the Nineteenth Century to the Present Day*, Routledge, London

Fine B & Rustomjee Z — 1996 *The Political Economy of South Africa: From Minerals-Energy Complex to Industrialisation*, Hurst & Company, London

Fine B — 2001 'The continuing imperative of value theory', *Capital & Class*, No 75:41-52

Fine B — 2007 'Rethinking critical realism: Labour markets or capitalism?', *Capital & Class*, No 91: 125-129

First R — 1977 *The Mozambican Miner: A study in the export of labour*, Centro de Africanos, Unversidade Eduardo Mondlane, Mozambique

First R — 1983 *Black Gold: The Mozambican Miner, Proletarian and peasant*, The Harvester Press, Sussex

Fleetwood S — 2001 'What kind of theory is Marx's Labour *Theory* of Value? A critical Realist inquiry', *Capital & Class*, No 73:41-77

Flyvbjerg B — 2001 *Making Social Science Matter: Why social inquiry fails and how it can succeed again*, Cambridge University Press, Cambridge

Fone JR — 1985 'Observations of actual leadership behaviours used by the stope production team leader in his work situation', Human Resources Laboratory, Task No GH3R01, *Chamber of Mines of South Africa Research Organisation* (COMRO)

Fone JR & Veldsman TH — 1989 'A Strategy for the training of learner miners, Internal Report', Project No GH7A (HR 9/89), *Chamber of Mines Research Organisation* (COMRO)

Franz, RM & Edwards AL — 2009 'NIHL Prevention Programme - Track C Training and Awareness and HPD selection', Council for Scientific and Industrial Research (CSIR), Project

number SIM 05 05 01, *Mine Health and Safety Council* (SIMRAC)

Franzsen Commission — 1977 'Report of the Commission of Inquiry into the possible introduction of a five-day working week in the mining industry', *Government Gazette*, Report 97/1977, Republic of South Africa

Franzsen Commission — 1978 'Second Report of the Commission of Inquiry into the possible introduction of a five-day working week in the mining industry', *Government Gazette*, 19 August 1978, Republic of South Africa

Fromm E — 1971 *Marx's concept of man*, Frederick Ungar Publishing Co, New York

Frost DJ — 1987 *The Hesitant Revolution: Mechanisation, Labour and the Gold Mines*, BSc Honours thesis, University of Cape Town

Garfinkel H — 1967 *Studies in Ethnomethodology*, Prentice-Hall, Englewood Cliffs, New Jersey

Geertz C — 1975 The Interpretation of Cultures, Hutchinson, London

Giddens A — 1972 *Positivism and Sociology*, Heinemann, London

Giddens A — 1981 *A Contemporary Critique of historical Materialism*, MacMillan Press Ltd, Houndmills, Basingstoke and London

Glass Y — 1958 'Seasonal fluctuation of Native labour on the gold mines' (Interim Report) *National Institute of Personnel Research*, Johannesburg

Glass Y — 1967 'A Sociological analysis of motivational factors among a group of stopers, shift bosses and mine overseers', Human Sciences Laboratory, Project No 751/64/10710, Research Report No 91/67, *Transvaal and Orange Free State Chamber of Mines*

Glennie P & Thrift N — 1996 'Reworking E.P.Thompson's 'Time, Work-Discipline and Industrial Capitalism'', *Time and Society*, Vol 5:275-299

Glorieux I, Mestdag I & Minnen J — 2008 'The coming of the 24-hour Economy? Changing work schedules in Belgium between 1966 and 1999', *Time & Society*, Vol 17:63-83

Glucksmann M — 2005 'Shifting boundaries and interconnections: Extending the 'total social organisation of labour'', *Sociological Review*, Vol 53:19-36

Goffman I — 1959 *The Presentation of the Self in Everyday Life, Anchor Books*, Doubleday & Co, USA

Goldman S — 1992 *The Wellbeing Sequelae of Shiftwork on a group of South African workers*, MA thesis, University of the Witwatersrand

Golden L & Figart DM (Eds) — 2000 *Working Time: International Trends, theory and policy perspectives*, Routledge, London and New York

Goldner L — 2005 'The Critique of Pure Theory: Moishe Postone's Dialectic of the Abstract and the Abstract', http://home.earthlink.net/~lrgoldner/postone.html

Gold Producers Committee — 1948 Evidence to the (van Eck) Commission on Conditions of Employment in the Gold Mining Industry (UG 28 of 1950),

Goldstein C — 1996 *The Quality of Social Support of Male Shift Workers*, MA thesis, University of the Witwatersrand

Gordon RJ — 1977 *Mines, Masters and Migrants: Life in a Namibian Mine Compound*, Ravan Press, Johannesburg

Gould CC — 1978 *Marx's Social Ontology: Individuality and Community in Marx's Theory of Social Reality*, The MIT Press, Cambridge Massachusetts and London, England

Gouldner AW — 1964 *Patterns of Industrial Bureaucracy*, Free Press, New York

Gramsci A — 1971 *Selections from the Prison Notebooks of Antonio Gramsci*, Hoare Q & Smith GN (Eds), Lawrence and Wishart, London

Grewe B — 2007 'Golden Strings: Men, Mines and Markets in the twentieth Century', Wits Interdisciplinary Research Seminar, *Wits Institute for Social and Economic Research* (WISER), 15 October, University of the Witwatersrand, Johannesburg

Grossman H — 1977 'Archive: Marx, Classical Political Economy and the problem of dynamics Part I and Part II', *Capital & Class*, No 2:32-55

Guild R, Ehrlich RI, Johnston JR & Ross MH — 2001 *SIMRAC Handbook of Occupational Health Practice in the South African Mining Industry*, The Safety in Mines Research Advisory Committee, Johannesburg

Gunningham N — 2008 'Occupational Health and Safety, Worker Participation and the Mining Industry in a Changing World of Work', *Economic and Industrial Democracy,* Vol 29:336-361

Guy J & Thabane M — 1988 'Technology, ethnicity and ideology: Basotho miners and shaft-sinking on the South African gold mines', *Journal of Southern African Studies*, Vol 14, No 2:257-278

Gurevich AJ — 1972 *Categories of Medieval Culture*, Routledge & Kegan Paul, London

Gurtunka — 1998 'Mining below 3000m and challenges for the South African gold mining industry', Plenary Address, *3rd International Conference on Mechanics of Jointed and Faulted Rock,* April 6-9, Vienna, Austria

Hamann R & Kapelus P — 2004 'Corporate Social Responsibility in Mining in Southern Africa: Fair Accountability or just greenwash?' *Development*, Vol 47:85-92

Harris P — 1975 'Industrial Workers in Rhodesia, 1946-1972: Working class `elites or lumpenproletariat?', *Journal of Southern African Studies*, Vol 1, No 2: 139-161

Hammersley M & Atkinson P — 1985 *Ethnography: Principles in Practice*, Routledge, London

Harries P — 1994 *Work, Culture and Identity: Migrant labourers in Mozambique and South Africa, c 1860-1910*, University of the Witwatersrand Press, Johannesburg and Heinemann, London

Hart RA — 2004 *The Economics of Overtime Working*, Cambridge University Press, New York

Harvey C — 1974 'British Investment in South Africa', *Journal of Southern African Studies*, Vol 1, No 1: 418-434

Harvey D — 1990 'Between Space and Time: Reflections on the Geographical Imagination', *Annals of the Association of American Geographers*, Vol 80, No 3: 418-434

Head J — 1995 'Migrant Mine labour from Mozambique: What prospects?', *Crossing Boundaries: Mine Migrancy in a democratic South Africa*, Crush J & James W (Eds) Institute for Democracy in South Africa, Rondebosch

Heiler K (Ed) — 1998 'The 12 Hour Workday: Emerging Issues', Working Paper No.51, *Australian Centre for Industrial Relations and Training* (ACIRRT), University of Sydney

Heiler K — 2000 Rostering and shiftwork arrangements in the Queensland Mining Industry: Key trends, Queensland Mining Council OHS Conference, *Australian Centre for Industrial Relations and Training* (ACIRRT), University of Sydney

Heiler K — 2002 The Struggle for Time: A review of extended shifts in the Tasmanian mining industry, Overview Report, *Australian Centre for Industrial Relations and Training* (ACIRRT), University of Sydney

Heiler K, Pickersgill R & Briggs C — 2000 'Working Time Arrangements in the Australian Mining Industry: Trends and Implications with particular reference to occupational health and safety', *International Labour Organisation*, Geneva

Herrick — 1998 'Process Re-engineering of a trackless development work cycle and the design of a continuous shift roster', Fulco and Innovative Working

Arrangements Colloquium, *The South African Institute of Mining and Metallurgy*, Johannesburg

Hewitt CB — 1973 'The Bantu Production Supervisor in the Gold Mining Industry: A Review of Research 1948-1972', Research Report No 44/73, Human Sciences Research Laboratory, *Chamber of Mines of South Africa*

Heydebrand W — 2003 'The Time Dimension in Marxian Social Theory', *Time & Society* Vol 12, No2/3:147-188

Hodgson G — 1981 'Critique of Wright: 1. Labour and Profits', Steedman I (Ed) *The Value Controversy*, Verso, London

Hochchilds A — 1997 *The time-bind: When Work Becomes Home and Home Becomes Work*, Metropolitan Books, New York

Honderich T (Ed) — 1995 *The Oxford Companion to Philosophy*, Oxford University Press, Oxford & New York

Horner D & Kooy A — 1980 'Conflict on South African Mines, 1972-1979', *Saldru Working Paper No 29*, South African Labour and Development Research Unit (SALDRU), Cape Town

Hovis L & Mouat J — 1996 'Miners, Engineers and the Transformation of Work in the Western Mining Industry, 1880-1930', *Technology and Culture*, Vol 37, No 3:429-456

Hudson W — 1954 'Factors affecting the popularity of mines and the mining industry', *National Institute of Personnel Research*, Johannesburg

Hunter P — 1992 'Housing, Hostels and Migrancy: A Case Study of Accommodation Practices at JCI's Gold Mines', *Labour, Capital and Society*, Vol 25, No 1:88-103

Hyslop J — 2004 *The Notorious Syndicalist - JT Bain: A Scottish Rebel in Colonial South Africa*, Jacana Media, Johannesburg

Innes, D — 1984 *Anglo: Anglo American and the rise of modern South Africa*, Ravan Press, Johannesburg

International Labour Organisation — 2002 'Notes on the proceedings', Tripartite Meeting of the Evolution of Employment, Working Time and

Training in the Mining Industry', *International Labour Organisation*, Geneva

James WG — 1987 'Grounds for a Strike: South African Gold Mining in the 1940's', *African Economic History*, No 16:1-22

James WG — 1992 *Our precious metal: African labour in South Africa's gold industry, 1970-1990*, David Phillip, Cape Town

Jensen A — 1965 'Psychological and Sociological factors in the motivation of Bantu mine workers', Human Sciences Laboratory, Research Report No 33/65 *Transvaal and Orange Free State Chamber of Mines Research Organisation*

Jensen A — 1969 'A review of Personnel Research in the Gold Mining Industry: 1947-1968', Research Report No 16/70, Human Science Research Laboratory, *Chamber of Mines of South Africa Research Organisation* (COMRO)

Jeeves AH — 1975 'The Control of Migratory Labour on the South African Gold Mines in the Era of Kruger and Milner' in *Journal of Southern African Studies*, Vol 2, No 1: 3-29

Jeeves AH — 1985 *Migrant Labour in South Africa's Mining Economy: The struggle for the Gold Mine's Labour Supply, 1890-1920*, Witwatersrand University Press, Johannesburg

Jeeves AH & Crush J — 1995 'The failure of stabilisation experiments on South African Gold Mines', *Crossing Boundaries: Mine Migrancy in a democratic South Africa*, Crush, J & James W (Eds), Institute for Democracy in South Africa, Rondebosch

Jennings N — 2002 'The Evolution of employment, working time and training in the mining industry', Report for discussion at the tripartite Meeting on the Evolution of Employment, Working Time and Training in the Mining Industry, *International Labour Organisation*, Geneva

Jick TD — 1979 'Mixing Qualitative and Quantitative Methods: Triangulation in Action', *Administrative Science Quarterly*, Vol 24, No 4:602-611

Johannes CH — 1974 'The effect of a longer shift on physiological parameters and the production by miners', Research Report No 124/73, *Chamber of Mines of South Africa Research Organisation* (COMRO)

Johnson JV & Lipscomb J — 2006 'Long Working Hours, Occupational Health and the Changing Nature of Work Organisation', *American Journal of Industrial Medicine*, Vol 49: 921-929

Johnstone FA — 1976 *Class, Race and Gold: A study of Class Relations and Racial Discrimination in South Africa*, University Press of America, Lanham

Johnstone FA — 1994 'Class conflict and colour bars in the South African gold mining industry, 1910-1926', *Work and Industrialisation in South Africa: an Introductory Reader*, Webster E, Alfred L, Bethlehem L & Selikow T, Ravan Press, Johannesburg

Jonas S — 2000 *'The Human Factor in Safety: An AngloGold Investigation into Safety related matters'*, Confidential Report, Johannesburg

Jones S & Inggs J — 1994 'An overview of the South African Economy in the 1980's', South African Journal of Economic History, Vol 9, No 2:1-18

Julkunen R — 1977 'A Contribution to the Categories of Social Time and the Economy of Time', *Acta Sociologica*, Vol 21, No 1:5-24

Kallaway P — 1976 'Black responses to an industrialising economy "labour shortage" and "Native Policy" in Griqualand West 1870-1900', *Conference on Southern African Labour History*, African Studies Institute, University of the Witwatersrand, Johannesburg

Katovich MA — 1987 'Durkheim's Macrofoundations of Time: An Assessment and Critique', *Sociological Quarterly*, Vol 28, No 3: 367-85

Katz EN — 1976(a) *A trade union aristocracy*: *A history of white workers in the Transvaal and the general strike of 1913*, Institute for African Studies, University of the Witwatersrand, Johannesburg

Katz EN — 1976(b) 'Early South Africa Trade Unions and the White Labour Policy, Conference on Southern African Labour History', *African Studies Institute*, University of the Witwatersrand, Johannesburg, 8-10 April

Katz EN — 1994 The White Death: Silicosis on the Witwatersrand Gold Mines 1886-1910, University of Witwatersrand Press, Johannesburg

Katz EN — 1995 'The Underground Route to Mining: Afrikaners and the Witwatersrand Gold Mining Industry from 1902 to the 1907 Miner's Strike', *The Journal of African History*, Vol 36, No 3:467-489

Katz EN — 1999 'Revisiting the Origins of the Industrial Colour Bar in the Witwatersrand Gold Mining Industry', 1891-1899', *Journal of Southern African Studies*, Vol 25, No 1:73-97

Kay G — 1979(a) *The Economic Theory of the Working Class*, The MacMillan Press, London and Basingstoke

Kay G — 1979(b) 'Why labour is the starting point of capital', *Value: The Representation of Labour in Capitalism*, Elson D (Ed), CSE Books, London

Kay G & Mott J — 2004 'Concept and Method in Postone's *Time, Labour and Social Domination*', *Historical Materialism*, Vol 12, No 3:169-187

Kettler D & Loader C — 2004 'Temporising with Time Wars: Karl Mannheim and Problems of Historical Time', *Time & Society*, Vol 13; No2/3:155-172

Kenny B & Bezuidenhout A — 1999 'Contracting, complexity and control: An overview of the changing nature of subcontracting in the South African mining industry', *The Journal of the South African Institute of Mining and Metallurgy*, Johannesburg, July/August, pp185-191

Ketsitse T — 1998 'Analysis of Fulco and its aftermath - the NUM perspective', Fulco and Innovative Working Arrangements Colloquium, *The South African Institute of Mining and Metallurgy*, Johannesburg

Kielblock AJ — 1995 'Health and Safety implications of shift work for the South African Mining Industry', Draft Final Project Report, *Safety in Mines Advisory Council* (SIMRAC), Johannesburg

Kielblock AJ — 1998 'Shift work: Health and Safety consequences for the South African Mining Industry', Fulco and Innovative Working Time Arrangements Colloquium, *The South African Institute of Mining and Metallurgy*, Johannesburg

Kicillof A & Starosta G — 2007(a) 'Value form and class struggle: A critique of the autonomist theory of value', *Capital & Class*, No 92:13-40

Kicillof A & Starosta G — 2007(b) 'On Materiality and Social Form: A Political Critique of Rubin's Value-Form Theory', *Historical Materialism*, Vol 15:9-43

Kimble J — 1999 *Migrant Labour and Colonial Rule in Basutoland, 1890-1930*, Institute of Social and Economic Research, Grahamstown

Krickler J — 1999 'The Commandos: The Army of White Labour in South Africa', *Past and Present*, No 163:202-244

Krikler J — 2001 'White working class identity and the Rand Revolt', *History Workshop & Wits Institute for Social and Economic Research*, University of the Witwatersrand, Johannesburg, 5-8 July

Krickler J — 2005 *The Rand Revolt: The 1922 Insurrection and Racial Killings in South Africa*, Jonathan Ball, Jeppestown

Kynoch G — 2000 'Marashea on the Mines: Economic, Social and Criminal Networks on the South African Gold Fields, 1947-1999', *Journal of Southern African Studies*, Vol 26, No 1:79-103

Kynoch G — 2003 'Controlling the coolies: Chinese mineworkers and the struggle for labor in South Africa, 1904-1910', *International Journal of African Historical Studies*, Vol 36, No 2309-329

Kynoch G — 2005 'Your Petitioners are in Mortal Terror': The Violent World of Chinese Mineworkers in South Africa, 1904-1910', *Journal of Southern African Studies*, Volume 31, No 3: 531-546

LaJeunesse RM — 2000 *The Economic and Social Aspects of Work Time*, PhD thesis, Colorado State University, Colorado

Laibman DL — 2000 'Rhetoric and Substance in Value Theory: An Appraisal of the New Orthodox Marxism', *Science & Society*, Vol 64: No 3:310-332

Landes DS — 1983 *Revolution in Time: Clocks and the Making of the Modern World*, Cambridge, Massachusetts and London

Lawrence AC — 1969 'Motivational factors among production shift bosses', Human Sciences Laboratory, Research Report No 21/69, *Chamber of Mines Research Organisation*

Lawrence AC & De Ru GSC — 1970 'Improvement in motivation of shift bosses in a gold mine - a case study', Human Sciences Laboratory, Research Report No 52/70, *Chamber of Mines Research Organisation*

Lee S — 2004 ''Working hour gaps', *Working time and workers' preferences in industrialized country: Finding the balance*, Messenger J (Ed), International Labour Office, Geneva

Lefebvre H — 1991 *The Critique of Everyday Life: Volume 1*, translated by John Moore, Verso, London

Legassick M — 1974(a) 'South Africa: Capital Accumulation and Violence', *Economy and Society*, Vol 3, No 3:253-62

Legassick M — 1974(b) 'Legislation, Ideology and Economy in Post-1948 South Africa' in *Journal of Southern African Studies*, Vol 1, No1: 5-35

Legassick M — 1974(c) 'The mining economy and the White Working Class', *Collected Papers of Martin Legassick*, Vol 1, (Compiled by Bozzoli B), University of the Witwatersrand

Legassick M — 1975 'The analysis of Racism in South Africa: the case of the mining economy', *IDEP/UN International*

Seminar on Socio-economic trends and policies in Southern Africa, 1-8 December, Dar es Salaam

Legassick M & Hemson D — 1976 'Foreign Investment and the Reproduction of Racial Capitalism in South Africa', *Collected Papers of Martin Legassick*, Vol 1, (Compiled by Bozzoli B), University of the Witwatersrand

Leger JP — 1985 'Towards Safer Underground Gold Mining: An investigation commissioned by the National Union of Mineworkers', Labour Studies Research Report 1, *Sociology of Work Program*, University of the Witwatersrand

Leger JP — 1986 'Safety and the organisation of work in South Africa gold mines: A crisis of control', *International Labour Review*, Vol 125, No5:591-603

Leger JP — 1991 'Trends and causes of fatalities in South African mines', *Safety Science*, Vol 14:169-185

Leger JP — 1992 *Talking Rocks: an Investigation of the Pit Sense of Rockfall Accidents amongst Underground Goldminers*, PhD Thesis, University of the Witwatersrand, Johannesburg

Leger JP & Nicol M — 1992 'South Africa's Gold Mining Crisis: Challenges for Restructuring', *Transformation*, No 20:17-35

Le Goff J — 1980 *Time, Work and Culture*, Chicago University Press, Chicago

Leon Commission — 1995 'Report of the Commission of Inquiry into Safety and Health in the Mining Industry', *Government Gazette*, Notice Number R889, Republic of South Africa

Le Roux L — 1985 'A Guide to Job Evaluation Systems Used in South Africa', *South African Labour Bulletin*, Vol10, No4:83-92

Levy N — 1982 *The foundations of the South African cheap labour system*, Routledge & Kegan Paul, London

Lewis P — 1997 'Aspects of the Labour Regime in the Gold Mining Industry: An Analysis of Full Calendar

Operations in the 1990's', *Industrial Health Research Group*, Johannesburg

Lewis P — 2001 'Doing time on the South African Gold mines: the move towards full-calendar operations', *Working Time: Towards a 40-hour week in South Africa*, Adler G(Ed) National Labour and Economic Development Institute (NALEDI), Johannesburg

Lewis P & Wegner T — 2000 'The effects of full calendar operations (fulco) and other non-standard work organisational features on underground frequency and severity in SA mines', Project No. GEN606, *Safety in Mines Advisory Committee* (SIMRAC), Johannesburg

Luckhardt K & Wall B — 1980 *Organise or Starve! The History of the South African Congress of Trade Unions*, Lawrence and Wishart, London

Lundall P — 1990 'Shorter working hours: Possibilities for South Africa', Saldru Working Paper No 79, *South Africa Labour and Development Research Unit* (SALDRU), Cape Town

MacArthur D — 1977 'Evaluating the effectiveness of the re-employment and early return bonus scheme', Bulletin 2.4, *Human Resources Monitor*, Chamber of Mines, Johannesburg

MacMurray MC — 1978 'Black Labour in the South African Gold Mining Industry: 1966-1974', Report No16, *Labour Research Programme*, University of the Witwatersrand

Maller J — 1992 *Conflict and Co-operation: Case studies in worker participation*, Ravan Press, Johannesburg

Malinowski B — 1967 *A Diary in the strict sense of the term*, Routledge & Kegan Paul, London

Mandel E — 1977 *Marxist Economic Theory*, [4th Impression] London, Merlin Press

Mandel E — 1978 *Late Capitalism*, Verso, London

Maniatis T — 1996 'Testing Marx: A note', *Capital & Class*, No 59:37-60

Manona C — 1980 'Marriage, Family Life and Migrancy in a Ciskei Village', Mayer P (Ed), *Black Villagers in an Industrial Society: Anthropological perspectives on labour migration in South Africa*, Oxford University Press, Cape Town

Marks S & Trapido S — 1981 'Lord Milner and the South African State', Bonner P (Ed), *Working Papers in Southern African Studies, Volume 2*, Ravan Press, Johannesburg

Marks S & Rathbone R (Eds) — 1982 *Industrialisation and Social Change in South Africa: African class formation, culture and consciousness 1870-1930*, Longman Group Ltd, London

Martorana PV & Hirsch PM — 2001 'The social construction of 'overtime', *The Transformation of work*, Vol 10:165-187

Marx K — 1973 *Grundrisse: Foundations of the Critique of Political economy*, Harmondsworth, Penguin Books

Marx K & Engels F — 1975 *Selected Correspondence*, Moscow, Progress Publishers

Marx K — 1976 *Value studies by Marx*, Dragstedt A (Translator and editor), London, New Park Publications

Marx K — 1977 *Capital, Volume I*, (9th Edition), Lawrence & Wishart, London

Marx K — 1978 *The Poverty of Philosophy*, Foreign Languages Press, Peking

Marshall G — 1994 *Oxford Concise Dictionary of Sociology*, Oxford, Oxford University Press

Mauer KF — 1972 'Human Factors in Stope Productivity: A Field Experiment Part II: Reactions of Bantu mineworkers', Research Report No 37/2, *Human Sciences Laboratory*, Chamber of Mines of South Africa Research Organisation (COMRO)

Mauer KF — 1975 'Human factors in stope productivity on three gold mines', *Human Resources Laboratory*, C.O.M Reference Project No GH2001, Research Report No 54/75

McAllister P — 1976 'Migrant Labour Project: report on the pilot study', *Institute of Social and Economic Research*, Rhodes University, Grahamstown

Mbenga A & Manson B — 2003 'The Richest Tribe in Africa: Platinum-Mining and the Bafokeng in South Arica's North West Province', 1965-1999, *Journal of Southern African Studies*, Vol 29, No1:25-47

McCann D — '2004 Regulating working time needs and preferences', *Working time and workers' preferences in industrialized country: Finding the balance*, Messenger J (Ed), International Labour Office, Geneva

McCulloch J — 2002 *Asbestos Blues: Labour, Capital, Physicians and the State in South Africa*, James Currey, Oxford

McCulloch J — 2003 'Women Mining Asbestos in South Africa, 1893-1980', *Journal of Southern African Studies*, Vol 29, No 2:413-432

McNally D — 2004 'The Dual Form of Labour in Capitalist Society and the Struggle over Meaning: Comments on Postone', *Historical Materialism* Vol. 12, No 3:189-208

McNamara K — 1980 'Brothers and Work Mates: Home friend networks in the social life of black migrant workers in a gold mine hostel', *Black Villagers in an Industrial Society: Anthropological perspectives on labour migration in South Africa*, Mayer P (Ed), Oxford University Press, Cape Town

McNamara K — 1985 *Black Worker Conflicts on South African Gold Mines, 1973-1982*, PhD thesis, University of the Witwatersrand, Johannesburg

Meel BL — 2003 ''Doing time' at the mines by mineworkers of the former Transkei, South Africa', IX *South African Sociological Association*, 27 June to 2 July, Durban

Messenger J — 2006 'Decent working time': balancing the needs of workers and employers', Burke, RJ (Ed), *Research companion to Working Time and Work Addiction*, Cheltenham, UK, Edgar Elgar

Metcalf D — 1986 'Cutting Work Time as a Cure for Unemployment', Occasional Papers in Employment Studies No 6, *Employment Research Center*, University of Buckingham, Buckingham

Mets JT — 1986 'Adverse Effects of Working Twelve Hour Shifts', *Second Annual Conference of the Ergonomics Society of Southern Africa*, Cape Town

Miller K — 2004 'The Question of Time in Postone's *Time, Labor and Social Domination', Historical Materialism*, Vol 12, No 3:209-237

Mine Workers' Union — 1979 'The Wiehahn Commission: A critique & some reactions', Working Paper No 25, *South African Labour Development Research Unit* (SALDRU)/*South African Labour Bulletin* (SALB), Cape Town

Minge-Klevana W — 1980 'Does Labor Time Decrease with Industrialisation? A survey of Time-Allocation Studies', *Current Anthropology*, Vol 21, No 3:279-298

Momberg AP — 1981 'The job of Stope Production Team Leader in the Gold Mining Industry', Research Report No 55/81, Human Sciences Research Laboratory, *Chamber of Mines Research Organisation* (COMRO)

Momberg AP & Pheta R — 1975 'Work-related attitudes of hand-loaders in the coal mining industry', Project No GH201, Research Report No 65/75, Human Sciences Research Laboratory, *Chamber of Mines Research Organisation* (COMRO)

Moodie TD — 1976 'The Perceptions and Behaviour Patterns of Black Mineworkers on a Group Gold Mine', *The Industrial Relations Department, Manpower Resources Division*, Johannesburg, Anglo American Corporation of South Africa Limited

Moodie TD — 1986 'The Moral Economy of the Black Miner's Strike of 1946', *Journal of Southern African Studies*, Vol 13, No1: 1-35

Moodie TD with Ndatshe V — 1994 *Going for gold: Mines, Men and Migration*, University of California Press, Berkeley

Moodie TD 1997 ‘Profitability, Respectability and Challenge: (Re) Gaining Control and Restructuring the Labor Process while maintaining racial order on the South African Gold Mines, 1913-1922’, *Racialising Class, Classifying race - A Conference on Labour and Difference in Africa*, USA and Britain, 11-13 July, St Antony’s College, University of Oxford, Oxford

Moodie TD 2005 ‘Maximum Average Violence: Underground Assaults on the South African gold Mines, 1913-1965’, *Journal of Southern African Studies*, Vol 31, No 3:547-567

Moodie TD 2009 ‘Managing the 1987 Mine Workers Strike’, *Journal of Southern African Studies*, Vol 35, No 1:45-61

Moodie TD 2010 ‘Outraged feelings burst forth’, *South African Labour Bulletin*, Vol 33 No 5:68-70

Moorsom R 1977 ‘Underdevelopment, contract labour and worker consciousness in Namibia, 1915-1972’ in *Journal of Southern African Studies*, Vol 4, No 1: 52-87

Moroney S 1978 ‘Mine Worker Protest on the Witwatersrand, 1901-1912’ in Webster E (Ed), *Essays in Southern African Labour History*, Ravan Press, Johannesburg

Moroney S 1982 ‘Mine Married quarters: The differential stabilisation of the Witwatersrand workforce 1900-1920’, Marks, S and Rathbone, R (Eds), *Industrialisation and Social Change in South Africa: African class formation, culture and consciousness 1870-1930*, Longman Group Ltd, London

Morrison JF Wyndham CH, Viljoen J & Bernade AJ 1965 ‘Probable effects of an extra hour’s work on physiological strain and heat stroke risks’, Research Report No 45/65, *Human Sciences Research Laboratory*, Chamber of Mines Research Organisation (COMRO)

Moseley F 1991 *The Falling Rate of Profit in the Postwar United States Economy*, Macmillan, London

Moseley F — 1997 *Marx's Economic Theory: True or False? A Marxian Response to Blaug's Appraisal*, 25th Encontro Nacional de Economia of ANPEC, 11 December, Recife, Brazil

Mosselmans B — 2004 'Time and value in the history of political economy', *Foundation of Science*, Vol 10:325-345

Murray C — 1981 *Families Divided: The impact of migrant labour in Lesotho*, Ravan Press, Johannesburg

NOHSC — *1995 Work Digest: Working Time around the World, National Occupational Health and Safety Conditions Commission*

Nattrass N — 1995 'South African Gold Mining: The 1980's and Beyond', *Crossing Boundaries: Mine Migrancy in a democratic South Africa*, Crush J & James W (Eds), Institute for Democracy in South Africa (IDASA), Rondebosch

Nell GW & Herholdt JD — 1998 'The St Helena five day working plan', Fulco and Innovative Working Arrangements Colloquium, Johannesburg, *The South African Institute of Mining and Metallurgy*, Johannesburg

Neuman WL — 2000 *Social Research Methods: Quantitative and Qualitative Approaches*, Nedham Heights, Massachusetts, Allyn and Bacon

Ngai PUN & Smith C — 2007 'Putting transnational labour process in its place: the dormitory labour regime in post-socialist China', *Work, Employment & Society*, Vol 21, No 1:27-45

Nkosi MZ — 1987 'American Mining Engineers and the Labour structure in the South African Gold Mines', *African Journal of Political Economy*, No 2: 63-80

Nichols T — 1977 *The Sociology of Industrial Injury*, Mansell Publishing, London

Neilson D — 2007 'Formal and real subordination and the contemporary proletariat: Re-coupling Marxist class theory and labour process analysis', *Capital & Class*, No 91:89-123

Nyland C — 1989 *Reduced worktime and the management of production*, Cambridge University Press, Cambridge

O'Brien TM, Harper GS, Mnisi M, Dias B & Naidoo D — 2006 'Project Scope for Low-Noise Drilling', Research agency: Council for Scientific and Industrial Research (CSIR), Final Project Report SIM 05 05 01, *Safety in Mines Research Advisory Committee*

Ochs KH — 1992 'The Rise of American Mining Engineers: A Case Study of the Colorado School of Mines', *Technology and Culture*, Vol 33, No 2:278-301

O'Connell MC — 1980 'Xesibe Reds, Rascals and Gentlemen at home and at work', Mayer P (Ed), *Black Villagers in an Industrial Society: Anthropological perspectives on labor migration in South Africa*, Oxford University Press, Cape Town

O'Donovan M — 1985 *The Politics of the Labour Process in Mining*, BA (Honours) dissertation, University of the Witwatersrand, Johannesburg

O'Meara D — 1979 'The 1946 Mine-Workers' Strike in the Political Economy of South Africa', Bonner PL (Ed) *Working Papers in Southern African Studies African Studies Institute,* University of the Witwatersrand, Johannesburg

O'Meara D — 1983 *Volks-kapitalisme: Class, Capital and Ideology in the development of Afrikaner Nationalism, 1934-1948*, Ravan Press, Johannesburg

Osbourne P — 1995 *The Politics of Time: Modernity and the Avant-Garde*, Verso, London and New York

Oxley J — 1989 *Down where no lion walked: The Story of Western Deep Levels*, Southern Book Publishers, Cape Town

Packard R — 1989 *White Plague, Black Labour*, University of Berkeley, California Press

Panitch L — 1986 *Working class politics in crisis*, Verso, London

Parsons JA — 1977 'How attractive is gold mining to black mineworkers? : A synthesis of research findings up to September 1977', Research Report No 42/77, *Human*

Sciences Laboratory, Chamber of Mines Research Organisation (COMRO)

Peeke S — 1987 *A Phenomenological account of work stress as it is experienced by black underground mine workers working as machine operators of a South African gold mine*, BA Honours thesis, University of the Witwatersrand, Johannesburg

Perold J — 1985 'The Historical and Contemporary Use of Job Evaluation in South Africa', *South African Labour Bulletin*, Vol 10, No 4:72-82

Perrings C — 1977 'The production process, industrial labour strategies and worker responses in the Southern African gold mining industry', Review Article, *Journal of African History*, Vol XVIII, No 1:129-135

Phakathi TT — 2001 *The changing relationship between teamwork and work culture in the South African gold mining industry: A case study of Tautona mine*, MA thesis, University of the Witwatersrand, Johannesburg

Phakathi TT — 2009 'Worker reactions to the stope team incentive scheme: Manufacturing consent of conflict?' XV *South African Sociological Association*, 28 June to 2 July, University of the Witwatersrand, Johannesburg

Phakathi TT — 2011 *Worker Responses to Work Reorganisation in a Deep-level Gold Mining Workplace: Perspectives from the Rock-face*, PhD thesis, Oxford University, Oxford

Pinnock D — 1981 ''Telona': Some reflections on the work of a private labour recruiter', *Saldru Working Paper No 31*, South Africa Labour and Development Research Unit (SALDRU), University of Cape Town (UCT), Cape Town

Phimister I — 1977 'White Miners in Historical Perspective: Southern Rhodesia, 1890-1953', *Journal of Southern African Studies*, Vol 3, No 2: 187-206

Phimister I — 1976 'African worker consciousness: Origins and Aspects to 1953', Conference on Southern African Labour History, *African Studies Institute*, 8-10 April, University of the Witwatersrand, Johannesburg

Polanyi M — 1958 *Personal Knowledge, Towards a Post-Critical Philosophy*, Routledge & Kegan Paul, London

Postone M — 1993 *Time, labour and social domination: A reinterpretation of Marx's critical theory*, Cambridge University Press, Cambridge

Postone M — 2004 'Critique and Historical Transformation', *Historical Materialism*, Vol 12, No 3:53-72

Quinlan M — 1988 'Psychological and Sociological Approaches to the Study of Occupational Illness: A Critical Review', *Australia New Zealand Journal of Sociology*, No 2: 189-207

Quinlan M — 1995 Achieving Efficiency and Accountability in Occupational Health and Safety and Workplace Reform, *School of Industrial Relations and Organisational Behaviour*, University of New South Wales, Sydney

Rabe M — 2004 'Being a father in a man's world: The experiences of goldmine workers', Manhood and Masculinity Symposium, *Wits Institute of Social and economic Research* (WISER), 5-7 September, Johannesburg

Railton P — 1984 'Marx and the Objectivity of Science', *Philosophy of Science Association*, Vol 2:813-825

Ralushai M — 2003 *Experiences of Women Working on the Mines: A Case Study from Rustenburg Platinum Mines*, Rand Afrikaans University, Johannesburg

Rawls AW — 2005 'Garfinkel's Conception of Time', *Time & Society*, 2005, Vol 14, No 2/3:163-190

Rex J — 1974 'The compound, reserve and urban location, essential institutions of southern African labour exploitation', *South African Labour Bulletin*, Vol 1: 4-27

Richardson P — 1976(a) 'Coolies and Randlords: The North Randfontein Chinese Miner's 'strike' of 1905', *Journal of Southern African Studies*, Vol 2, No 2: 151-177

Richardson P — 1976 (b) 'The role of the State in the Labour-market for the Gold Mines: the case of Chinese Labour, 1903-

1907', Conference on Southern African Labour History, *African Studies Institute*, 8-10 April, University of the Witwatersrand, Johannesburg

Richardson P — 1982 *Chinese Mine Labour in the Transvaal*, MacMillan Press, London

Richardson P & van-Helten JJ — 1982 'Labour in the South African gold mining industry, 1886-1914', Marks S & Rathbone R (Eds), *Industrialisation and Social Change in South Africa: African class formation, culture and consciousness 1870-1930*, Longman Group Ltd, London

Riis T — 1990 'Analysis of Working Hours', *Diogenes*, Vol 38:65-83

Ritzer G — 2000 *Sociological Theory* (5th Edition), New York, McGraw-Hill

Roberts B — 1987 'Marx after Steedman: Separating Marxism from 'Surplus Theory'', *Capital & Class*, No 32: 84-116

Roberts J — 2009 *The Hidden Epidemic Amongst Former Miners: Silicosis, Tuberculosis and the Occupational Diseases in Mines and Works Act in the Eastern Cape, South Africa*, Health Systems Trust and Department of Health, South Africa, Durban

Robertson NL, Thomas OF & MacArthur D — 1976 'Why are mineworkers staying for shorter periods in gold mining?' (Bulletin 1.11) *Human Resources Monitor*, Chamber of Mines, Johannesburg

Robinson J — 1966 *An Essay on Marxian Economics*, MacMillan, London

Roediger DR & Foner P — 1989 *Our Own Time: A History of American Labor and the Working Day*, Verso, London & New York

Rotberg RI — 1988 *The Founder: Cecil Rhodes and the Pursuit of Power*, Southern Book Publishers, Bergvlei, Cape Town

Rothman S & Joubert JHM — 2007 'Job demands, job resources, burnout and work engagement of managers at a platinum mine in the North West Province', *South African Journal of Business Management*, Vol 38, No 3: 49-61

Rowlinson M & Hassard J — 1994 'Economics, Politics and Labour Process Theory', *Capital & Class*, No 53:65-97

Rubin LB — 1974 *Worlds of Pain: Life in the Working-Class family*, Basic Books Inc, New York

Rubin II — 1972 *Essays on Marx's Theory of Value*, Black & Red, Detroit

Rubery J, Ward K, Grimshaw D & Beynon H — 2005 'Working Time, Industrial Relations and the Employment Relationship', *Time & Society*, Vol 14, No1:89-111

Scaff LA — 2005 'The Mind of the Modernist: Simmel on time', *Time & Society*, Vol 14: 5-23

Schwartz N — 1982 'The time of our being together: An inquiry into the meaning of Marx's labor theory of value', *New Political Science*, Vol 2, No 4:73-87

Segre S — 2009 'A Weberian Theory of Time', *Time and Society*, Vol 9:147-170

Shaikh A — 1977 'Marx's Theory of Value and the 'Transformation Problem', Schwarz J (Ed), *The subtle analysis of capitalism*, Goodyear, Santa Monica, California

Shaikh A — 1984 'The Transformation from Marx to Sraffa: Prelude to a Critique of the Neo-Ricardians', Mandel E and Freeman A (Eds), *Marx, Ricardo, the Langston Memorial Volume*, Verso, London

Sharfstein B-A — 1989 *The Dilemma of Context*, New York University Press, London and New York

Shor JB — 1991 *The overworked American: The unexpected decline of leisure*, Basic Books, New York

Simons HJ & Simons RE — 1969 *Class and Colour in South Africa 1850-1950*, Penguin Books, Harmondsworth

Sinclair IN — 1998 'Flexible working practices on Avgold Ltd – Hartebeesfontein Division', Fulco and Innovative Working Arrangements Colloquium, *The South African Institute of Mining and Metallurgy*, Johannesburg

Sitas A — 1979 'Rebels without a Pause: THE MWU and the Defence of the Colour Bar', *South African Labour Bulletin*, Vol 5, No 3: 30-58

Smith M — 1990 'Dead men tell no tales: An historical examination of mining accidents in the Witwatersrand gold mines, c 1901-1939', *Association of Sociology of South Africa* (ASSA), University of Stellenbosch, Stellenbosch

Smith MEG — 1994 'Alienation, Exploitation and Abstract Labor: A Humanist Defense of Marx's Theory of Value', *Review of Radical Political Economics*, Vol 26 No 1:110-133

Smith L, Stewart P, Dlulane G Ashworth SGE & Crafford A — 2004 'Development of junior management and supervisory personnel for the mining section of the future', Coaltech Research Task 2.8.2, *CSIR Miningtek*, Johannesburg

Sorokin P — 1943 *Sociocultural Causality, Space, Time: A Study Of Referential Principles Of Sociology And Social Science*, Duke University Press, Durham

Sorokin PA & Merton RK — 1937 'Social Time: A Methodological and Functional Analysis', *American Journal of Sociology*, Vol 42, No 5:615-629

South African Communist Party — 1986 'A Distant Clap of Thunder: Fortieth Anniversary of the 1946 Mine Strike', *South African Communist Party*

Southerton D & Tomlinson M — 2005 ''Pressed for Time'- the differential impacts of a 'time squeeze'', *Sociological Review*, Vol 53, No 2:215-239

Spandau A — 1979 'Mechanisation and Labour Policies on South African Mines', *Labour Research Programme*, Report No 22, University of the Witwatersrand, Johannesburg

Spindler GR — 2001 'Managing in Uncertainty: Lessons From The Underground', *Quality Progress*: 83-87

Sraffa P — 1963 *Production of Commodities by means of commodities: Prelude to a critique of economic theory*, Cambridge University Press, Cambridge

Spiegel AD — 1980 'Changing patterns of migrant labour and rural differentiation in Lesotho', *Social Dynamics*, Vol 6, No 2: 1-13

Steedman I — 1981 *The Value Controversy*, Verso, London

Stewart PF — 1981 *'A worker has a human face, Mahlabatini, Vosloorus hostel and an East Rand Foundry: Experiences of a Migrant Worker'*, BA (Honours) dissertation, University of the Witwatersrand

Stewart PF — 2000 'Surreptitious intrusion, complete insertion and total immersion: Reflections on participant observation', *The African Studies Seminar*, University of the Witwatersrand

Stewart PF — 2006 'Recovering lost production and normalising work relations after industrial strike action', Final Report, *'PGM' The Shaft and Union and Association Stakeholders*, Johannesburg

Stewart PF — 2007(a) 'Great Expectations: Expenditure patterns and assessment of Asbestos Relief Trust compensation awards, Final Report, *Asbestos Relief Trust and Wits Enterpris*e, Johannesburg

Stewart PF — 2007(b) '*Working time and labour power on the South African gold mines, 1886-2006: An initial scan of the secondary literature*, XII South African Sociology Congress (SASA), 25-8 June, University of the North-West, Potchefstroom

Stewart PF — 2010 'Working time and 'time off': Two sides of the same coin', *South African Labour Bulletin*, Vol 34, No 4:20-22

Stewart PF, Dart R & Jennings R — 2004 'The requirements, needs, constraints, preferences and interests of a representative sample of Anglo Platinum employees with regard to the Eleven Shift Fortnight, the Five Day Work Pilot Project and alternative shift systems', Research Report, *'PGM' and Union and Association Stakeholders,* Johannesburg

Strauss A — 1991 'Mead's Multiple Conceptions of Time and Evolution: Their Contexts and their Consequences for Theory', *International Sociology*, Vol 6, No 4: 411-426

Sweezy PM — 1962 *The Theory of Capitalist Development*, Monthly Review Press, New York

Taylor PS — 1979 'Labour time, work measurement and the commensuration of labour', *Capital & Class*, No 9:23-37

Thompson P — 1983 *The Nature of Work: An Introduction to Debates on the Labour Process*, (2nd Ed), Houndmills, Basingstoke and London, MacMillan

Thompson EP — 1967 'Time, Work-Discipline, and Industrial Capitalism', *Past and Present*, No 38:56-97

Tijdens K & Dragsta A — 2007 'How Many Hours Do You Usually Work? : An analysis of working hours questions in 26 large-scale surveys in six countries and the European Union', *Time & Society*, Vol 16, No19:119-130

Tomba M — 2007 'Differentials of Surplus-Value in the Contemporary Forms of Exploitation', *The Commoner*: *a web journal for other values*, No 12:23-37

Torgovnick M — 1997 *Primitive Passions: Men, Women and the Quest for Ecstasy*, University of Chicago Press, Chicago and London

Turner J — 1991 *The Structure of Sociological Theory*, Wadsworth Publishing Company, Belmont, California

Turrell R — 1982 'Kimberley: labour and compounds, 1871 1888', Marks S & Rathbone R (Eds), *Industrialisation and Social Change in South Africa: African class formation, culture and consciousness 1870-1930*, Longman Group Ltd, London

Ulicki T — 1999 'Basotho Miners Speak: Subcontracting on South African Gold Mines', South African Labour Bulletin, Vol 23, No 4: 61-66

Urry J — 2000 'Sociology of Time and Space', *The Blackwell Companion to Social Theory*, [2nd Edition], Turner B (Ed), Oxford, Blackwell Publishers

van der Horst S — 1942 *Native Labour in South Africa*, Oxford University Press, London

van der Wiel ACA — 1977 *Migratory wage labour: Its role in the economy of Lesotho*, Mazenod (Lesotho), Mazenod Book Center

van Onselen C — 1980 *Chibaro*, Ravan Press, Johannesburg

van Wanrooy B & Wilson S — 2006 'Convincing the toilers? Dilemmas of long working hours in Australia', *Work Employment Society*, Vol 20: 349-368

Visser W — 2008 *Van MWU tot Solidariteit - Geskiedenis van die Mynwerksunie, 1902-2002*, Solidarity, Pretoria

von Holdt K — 2000 *From resistance to reconstruction: a case study of trade unionism in the workplace and the community (1980-1996)* PhD thesis, University of the Witwatersrand, Johannesburg

Voth H-J — 2000 *Time and Work in England: 1750-1830*, Clarendon Press, Oxford

Walker IL & Weinbren B — 1961 *2000 Casualties: A history of the trade unions and the labour movement in the Union of South Africa*, South African Trade Union Council, Pietermaritzburg

Walker R — 1988 'The dynamics of value, price and profit', *Capital & Class*, No 35:146-181

Warwick P — 1978 'Black Industrial Protest on the Witwatersrand, 1901-1912' in Webster E (Ed), *Essays in Southern African Labour History*, Ravan Press, Johannesburg

Watts Miller W — 2000 "Durkheimian Time', *Time & Society*, Vol 9, No 1:5-19

Webster E — 1985 *Cast in a Racial Mould*, Ravan Press, Johannesburg

Webster E & Leger JP — 1992 'Reconceptualising skill formation in South Africa', *Perspectives in Education*, Vol 14, No 1:53-68

Webster E, Moodie D, Stewart P & Psoulis C — 1999 'The impact of Ultra-Deep Mining on the Occupational Culture of Miners' Final Task Report 1.4.1 *Deepmine Collaborative Research Programme*

Webster E, Burawoy M, Stewart P, Phakathi TT, Omar R & Fakier, K
2001 'A New Worker, a New Work Organisation for the 21st Century: An analysis and reconceptualisation of current training programmes in deep-level mining', *Sociology of Work Unit (SWOP)*, University of the Witwatersrand, Final Report, Task 1.5.1 *Deepmine Collaborative Research Programme*, Johannesburg

Webster E, Stewart P, Phakathi TT, Dlulane G & Fakier K
2002 'A Review and evaluation of career development strategies for production workers', *Sociology of Work Unit (SWOP)*, Final Report, Task 6.2.1, Futuremine, University of the Witwatersrand, Johannesburg

West EG
1983 'Marx's hythotheses on the Length of the Working Day', *Journal of Political Economy*, Vol 91, No 2:261-288

White DH
1976 'The Role of the Stope Team Leader as seen by Team Leaders, by the Supervisors and by their Subordinates', Research Report No. 8/76, *Chamber of Mines of South Africa*, (COMRO)

Wilson F
1972 *Labour in the South African Gold Mines: 1911-1969*, Cambridge University Press, Cambridge

Wilson F
1976 'International Migration in Southern Africa', Saldru Working Paper No 1, *South African Labour Development Research Unit* (SALDRU), University of Cape Town, Cape Town

Wolpe H
1972 'Capitalism and Cheap Labour Power in South Africa: From Segregation to Apartheid', *Economy and Society*, Vol 1, No 4:25-456

Wood S (Ed)
1982 *The Degradation of Work: Skill, deskilling and the labour process*, Hutchinson, London, Melbourne, Sydney, Auckland, Johannesburg

Wright EO
1978 *Class, Crisis and the State*, Verso, London

Wright EO
1981 'The Value Controversy and Social Research', Steedman I (Ed), *The Value Controversy*, Verso, London

Wyndham CH — 1972 'The possible effects on productivity and heat stroke risk of a longer working shift', Research Report No 55/72, *Human Sciences Research Laboratory*, Chamber of Mines Research Organisation (COMRO)

Yudelman D — 1983 *The Emergence of Modern South Africa*: *State, Capital and the Incorporation of Organised Labour on the South African Gold Fields, 1902-1939*, David Philip, Cape Town

Yudelman D & Jeeves A — 1986 'New Labour Frontiers for Old: Black Migrants to the South African Gold Mines, 1920-85', *Journal of Southern African Studies*, Vol 13, No1: 101-124

Zimbalist A (Ed) — 1979 *Case Studies on the Labor Process*, Monthly Review Press, New York and London

Appendix I

Working life on a mine and going underground.

> *Statistics quoted each year in the company's annual reports show impressive progress in all sectors of development and operations at Western Deeps. The figures rise in a bland upward curve, reaching higher and higher, always promising extensive future progress. But figures, impersonal and passive, tend to hypnotise and lead one to overlook the extent of the human effort and energy which goes into their creation. Bald statistics breed no feeling for the labour and the sweat, the dangers and the pain, and the enormous courage and stamina required every working day in maintaining the thrust and momentum of progress* (Oxley 1989:121).

This imaginary account, based on actual experience initiated at Western Deep Levels, serves as a primer to introduce the rudiments of mine work. In order to convey something of the meaning of underground work, it introduces the process of the working day and a sense of *what it is like* to work underground. It is the location at the rock face in a stope of a young African mineworker and his new-found work mates that is the focus of this narrative account of what happens in a day in the life of a novice recently arrived to work underground.[339]

> *Arriving at the mine*
>
> *Sipho, like tens of thousands before him, arrives at the mine by bus, taxi or train, perhaps on borrowed money. In the past men often walked. Coming from the township, he has been loitering in the hostel, waiting… He cannot help noticing the scuffed boots of the old timers lining the entrances of most rooms and whose faded overalls hang on lines nearby.*
>
> *Being signed on*
>
> *In the past Sipho would have been signed on by Teba or one of its forerunners. Since the early 1990's he and his ilk would most likely have been provisionally signed on at the gates of the mine, His first task would be to get through the system, the route chart requiring obtaining 17 different signatures from within the complex administrative system.*

[339] A mining engineer, Dr Ray Durrheim, deemed an earlier version of these actual accounts to have been 'typical' of mining.

The medical examination queues

One of the first sets of interminable queues which await him is that of the medical examination. For without the medical 'red-ticket' there is not yet a mining job to be had. There are queues for eye sight tests, chest X-rays, urine tests, a hearing test and a final general medical check up.

Heat tolerance test

Then there is the heat tolerance test[340] *conducted in an artificially heated chamber where everyone is arranged in rows and required to step up and down a 30cm concrete step while clad in a brief red wraparound with temperatures taken before and after, registering each prospective mineworkers tolerance to heat. Finally everyone emerges naked from the shower to toss a towel into a bin before the watchful eyes of greyed men who marshal the exposed bodies and who, in the past, apparently used to pick the 'boys' they wanted to serve as a 'mine wife'.(Moodie 1994:119-158)*

Getting the 'Red ticket'

Men chat quietly as they finally change and are visibly relieved as they crowd around an official who shouts out company numbers, signalling the successful completion of the medical examination. Arms reach to grasp their 'passport' to underground work, the medical 'red ticket". Work underground is now assured. Individual hopes and dreams can now be realised.

Being issued with PPE

The queues to collect Personal Protective Equipment (PPE) - boots and long thick socks, overalls, colour-coded hard hats, protective glasses, gloves, ear plugs - are possessed of an expectant air, with the novices clearly excited, yet somehow not without a sense of trepidation lingering…

The first morning

Next morning, around four am if it's the first shift of the day, as always, it is dark as the hostel awakes and men rise to ready themselves for work. The change house is permeated with a muggy steam and the smell of cheap soap in the early morning air. From there it would be off to wolf down warm soft porridge and four plain slices of bread, men standing around the 'swill bay' in their boots and mining gear, ready to go down. Just under an hour might have passed since rising. Sipho is in a taxi commuting to the mine a little later to get to the training centre at the reasonable hour of seven o clock.

[340] The heat tolerance tests replaced the earlier and much hated and exceptionally physically demanding prolonged acclimatisation process. See AIM (1976) and Oxley (1989: 151-152).

The training centre

Sipho will have spent his first few days at the training centre, begun to find his way around and been allocated a team and presumably arranged to meet the team leader immediately responsible for his introduction to work underground. Whatever the case, today he goes down for the first time.

Clocking in at the crush

With the last of the smokers' hurried cigarettes extinguished, men enter 'the crush' at the lamp-room which is as tight as ever as bodies jostle each other, having attached their cap lamps and requisitioned other equipment. The long, raw, descending concrete corridors down to the steel doors of the hoist blow cold with the ventilation that swirls strongly around as men get to go to line up to await the cage. Three tiers high, 40 men to a tier, the cage in the hoist is much tighter even than the crush. Two late-comers body charge a wall of overalls to force their way in. They are only ever macho rugby types. A straggle of voices swear at them. The offenders grunt. Most miners are silent.

Some chat quietly as the slide crashes to the metal and the bolt on the safety gates is roughly thrown by the onsetter who signals the machine winder on surface. Bells signal that all has been set for the cage to descend. It might now be around five fifteen in the morning, still dark during the winter months.

A bumpy ride in 'the cage'

The man-packed cage begins to fall, gathering speed, descending fast at around six meters a second, a lamp-light or two strobing the dusty swirling shaft seemingly racing by. It's a matter of minutes before, on this particular morning, the machine minder applies the hoist brake too strongly, stretching the wrist-thick, kilometre-long cable, turning the hoist into a veritable yo-yo. The metal grid underfoot feels like it disappears, stomachs rise, hearts involuntarily accelerate wildly. The 120 miners roar in unison. The cage bobs up and down, briefly hanging, before crashing down onto the bracket 'cups', aloud with voices now… It does not happen often. Sipho was just unlucky.

The slide on the hoist goes up and the miners now noisily disgorge on to the landing of the well-lit, white-washed shaft station. Now in a hurry to get to the sub-shaft, men rapidly converge into a single human stream, wasting no time to catch a good spot in the next queue. The night shift would be rushing past in the opposite direction, with shouts at workmates from the same section inquiring as to whether they had winched the stopes clean or not, such calls being as certain as sunrise and sunset. For the tenor and length of the shift would depend on answers elicited in this manner. At the turn-stiles at the next shaft station the process would be repeated with the shift dropping again a further 1000m and more to deeper levels

below. It is warmer now away from the main shaft. It's probably around five thirty in the morning…

Travelling underground

This cage stops at various levels. At each stop men fan out from the shaft station and disappear along the haulages, ever splitting up into the lattice work of the crosscuts before gradually coming together at the' waiting places' anything from a few hundred meters to a couple of kilometres from the shaft station. It is hotter here. Men change and are briefed. A few ask questions. The gang registers are checked. Instructions are issued. The litany of the safety procedure is intoned. The night shift's report is scrutinised by the team leader, his miner – whether white or black – seldom down this early. Depending on the depth and distance from the shaft, it could be anything from five thirty to six thirty in the morning. There could be a man-carriage to catch. It could be full. There might well be a good two or three kilometres to walk, especially on the older shafts. Workers working on the lower levels on this mine would be catching the third hoist, down to close to four kilometres deep in this mine where the deepest point is 4117 meters below the bank on surface.

The waiting place

At the waiting places there is almost inevitably no hurry, the spirit of place having now asserted itself. Some miners might change into worn overalls or clothes which had hung on a peg since the previous shift. The wearing of overalls in the hot stopes has only recently become more common. After a final check, men rouse themselves to enter the diggings either by a stiff climb up a raise, a walk down a gully or along a travelling way, all the time branching off to go about their business to prepare for the shift and get what is needed into the stopes. Those developing the tunnels would inevitably walk further. It could be anything from before six to seven in the morning. The heat was now already stultifying.

Making safe and marking off

It's very hot in the quiet, dusty, empty stope as Sipho's team leader is the first to enter to inspect and 'make safe'. The hanging is good. The pinch bar prods the hanging which rings loud with a clear sharp sound. That is always a good sign and the sound you are looking for. The inspection slowly proceeds slowly and carefully, prodding and prising. Only a few small pieces of rock get prised out of this hanging which takes around forty minutes this particular morning.

There is no support after the blast of the previous afternoon and no-one has been here except for the 'snakeman ' on night shift who had crawled up into the unsupported stope and connected the cables for the face winch to scrape down the ore-bearing rock - or 'stof' as it's called - into the gully. This is the nightshift's sole and crucial cleaning task.

The footwall is fine. The face is straight and there are no tell tale signs of misfires immediately visible. It was a good quality blast. The stope width is a standard 900mm. The packs are good. Most of the props are all still in place. Only one or two out of the forty got dislodged by the blast. Inspecting the hanging a little later worries Klaas the miner. It is 'too good' as far as he is concerned. This particular flat, solid, single slab is clearly marked with the distinct pattern of waves from the once gentle tides of an ancient sea. The miners generally don't like it. It doesn't tell if it wants to come down: no growing cracks or quiet creaks or claps or groans or fine powder or little stones…It does not talk to you. It just comes down… The red spray paint from marking of the burden remains suspended in the slowly moving air...

An unsafe gully sidewall

The night shift cleaned well. The face scraper lies on a heap of mixed rock at the toe of the stope. A couple of props are missing here. A gully pack needs to be built. Klaas, whom Sipho did not notice appearing, marks the spot with a tin of red spray. It's sweltering, but cooler than in the as yet unventilated stope. The side-walls further down the gully do not look good. They are badly stressed below the face of the leading stope, the point at which stress is most concentrated. The once solid rock peels open like a series of successive layers of babana skins laced with fine powder which tells of the extent of the pressure from the kilometres of rock that pushes inexorably in from all directions. It should be barred down. It has clearly been ignored for too long. The soft, splitting, peeling rock in parts has been reduced to handfuls of fine talcum-like powder and forms a casing along the side-walls of the gully, absorbing the sound of voices. A voice should bounce back. It is bad, really bad. It is not safe. It is really unsafe. It's now just past seven in the morning on 105 level, just more than two kilometres 'below collar' in what was until recently the deepest mine in the world.

Preparing the stope

The team is already close behind. Temporary supports clatter into the stope. The props need to be lugged all the way down the gully. The mono-winch is down. The pipes for the drill are tangled and that takes a bit of time to clear up. One of the two pneumatic percussive Ingersol rock drills is being greased. It suddenly guns into life, at around 114dB immediately drowning the voices of the men and the sound of wooden supports and the clang of metal 'headboards' and temporary supports being dragged or tossed into the stope. Then it cuts out. There is some lashing at the face. Someone is in a hurry. There are no temporary supports up yet. It is unmistakably the sound of shovel against crushed rock.

Erecting temporary support

One by one, temporary supports get ratcheted up and into place. That is why there was the sound of lashing. The footwall is not clean in parts and the heel of the

camlock prop needs to find firm purchase with the footwall. Another of the drills is greased, its hoses fixed with any wire ready to hand, generally a six inch nail threaded into ragged cloths around the waist of the rock drill operator. The guys all have their own ways of doing things. A missing prop gets hammered into place. Now everyone is busy and the guys are moving. Sipho is bringing in wooden madodo props from the gully. It is his first real job underground. The shift has started and its now definitely after seven o clock.

The heat

Glistening sweat has already begun to roll off muscled brown shiny backs and the smooth, hard arms of fully acclimatised bodies. It's hot, thirty degrees at least, wet-bulb temperature. Is it 31 or 32 degrees Celcius which is the legal limit? - 27,5 degrees Celcius is the aim. A headboard is pumped to pressure, a hundred pumps by hand per headboard to secure the prop against the hanging, forty props per regular stope face. Two men do the job, somewhat akin to a thousand push ups each. A drill now guns into life to work, shattering the confined air in the working space – in a back fill site 1,7m by 900mm by 40 m running at an angle between 15 and 30 degrees if you are lucky and the stope isn't rolling like the waves of the sea. Platinum mining is more like that than gold, to say nothing of the trenching and pot-holes which crop up in these shallower, but subtly different mines. Gold miners often make the mistake of thinking they can simply transfer their skills to platinum.

Drilling

The neatly marked red spots spell out the particular drilling 'burden' the rock mechanics might have set for this stope. Drilling of the shot holes has just begun. The guys plug their ears. Both drills, twenty meters apart - one at the top the other in the middle of the 40 meter stope - are at it. They add a welcome watery spray. Soon the dust will get thick and wet. It's just over an hour and a half into the shift. This is not bad going for 105 level, two shafts down and around 3km away from the 100 level shaft station.

Building a support pack

The shift settles into a regular pace, props going in, the pack is being built with Sipho learning how it's done, holes are being drilled. Visibility is down to less than a meter, cap lamps flashing in the murky, misty, dusty, slightly swirling dark. Now the shift is moving.

The shift boss

The shift boss Daan arrives, but he doesn't shout. That's always a relief. But he has quite a bit to say about the sidewalls of the gully. In fact he is a bit upset and has a right to be. It's worse than it looks when you actually take a good look. He

wants the gully pack built now, not later. With the stress on the side-wall and a missing prop on the leading face and a centre line gully pack not in, this is a recipe for trouble. He moves off down the gully to West 3 as the miner goes in search for hands to get three urgent jobs done.

It is too hot. There's a brattice open somewhere. Or maybe a ventilation door. 'The buggers never close them,' Klaas moans. It must be well over 30 degrees. But at least the job is moving. The line of forty props are steadily going in. The guys at the face are all working. The gully pack is being built. Then the water stops and the stope falls silent. Someone goes to look. It looked like Moeketsi. Sipho goes with him. It is cooler in the gully. No-one had to teach him to take a quick break if there was a chance. A rock drill operator's assistant also takes a break in the gully, while his RDO just stares implacably at the stope face. About five to ten minutes pass. It was Moeketsi who got the water going again and the stope springs back again into its noisy life. Then the water stops again and does not get going as quickly as before. It comes on again, but stops immediately. Time suddenly starts to drag. If this carries on it means we could end up finishing late. That's time spent underground unpaid - a very general complaint on many mines. And that does not feel good. Klaas now goes out to go and have a look. The water comes on again. The stope is immediately noisily, but welcomingly alive again.

Barring down

Two hours pass. It's now almost half way through the shift. It's just after nine and the shift is in full swing. The guys are drilling, the props are being installed, the gully pack is almost ready to get its cribs hammered home. Klaas's assistant Dan is sorting ignitron cords. Klaas mutters while he checks the red explosives box. Things don't tally and it's a legislative requirement that explosives are all accounted for. Sipho is barring down the loose and friable rock on the side wall of the gully for the first time, but he does not have a gasket on his pinch bar as he has just been taught at the training centre. Hardly anyone ever does. Another hour goes by and then another and then three and the end of the shift forgivingly appears in sight.

The line of props is done, the gully pack has been pressurised, the gully side wall is clean and sounds so much better for it. There is a lot of waste on the ground, Sipho, young and strong as he is, is spent. That is to be expected. His body has yet to acclimatise to underground work. It will take about ten days for it to do so. The machine operators are finishing off their holes. Now they just want to move off out of the stope back to the waiting place. Their overalls are sodden.

Charging up

Dan hangs around at the top of the stope quietly finishing off fitting his fuses to the ignitron cord, his packets of blue explosives at the ready. Sipho watches. It's going to get late and now he wants to start to charge up. By now it should have

been done. The water did hold us up. There's no overtime for being late and the queues at the station will be longer. The guys drill the last few holes and drag out their orange hoses while the last of the temporary support gets dismantled and dragged off. Dan and Klaas have now both jumped onto charging up. Now everyone starts to move out with a distinct sense of urgency. Daan passes by to check the gully pack and the side walls of the gully. That's unusual. He should have been up and out by eleven. Something must have happened down at West 3. But he seems ok, so there is no cause for alarm. Klaas shouts something down at Daan who responds cheerily enough. The stope is almost ready for the centralised blast. It is now just before one o clock.

Travelling to surface

Out, back up the gully, to the waiting place, along the haulage to the sub- station the men do the three or so kilometres at a fast stride to catch the queue at the turnstile. The cage is late. Everyone waits, a good number of workers catching an awkward snooze. There is a flurry when it arrives and the first group of 120 catch the cage up to the next shaft station, rush around to catch the final cage up, wait again, catch the cage and scramble through the turnstiles to clock out, 'crush' to detach and connect up their cap-lamp batteries for recharging, before breaking out into the sun and fresh air. It's just gone a quarter to two. Not bad.

Time to relax

The men are, as ever, ebullient, noisy, boisterous, satisfied, happy even... The relief is palpable. Having made it back up again safely to surface is ever evident. Despite the heat and the water stopping and being a little late, it was a good shift. Now indistinguishable from the rest of the men pouring through the crush, the mineworkers must now get to the change house, down to the swill bay to catch the last of lunch, scrub overalls and boots and gloves and hang them up. Only then is it really time to take it easy for a few hours before an early night and the next day's shift.

It is now past mid-afternoon, nearly four o'clock. A knot of men congregate outside the old sixties-style slasto and stone arena of this particular mine hostel, throwing good-natured curses at those who rush up late from every direction, yet not quickly enough for men who impatiently wait for a work mate. Some have already ambled off in the direction of the beer-hall. But shortly a relaxed and casual phalanx of men will march down the wide black-tarred roads which run through this hostel, an increasingly raucous and swelling bunch. Nothing and no-one on earth can stop them from this destination. We are going drinking.

Appendix II

Unperformed surplus value in a development end and while ‘ledging’.

This appendix provides two descriptive accounts of actual work sites based on participant observation. They both describe something of the struggle with geological conditions which characterizes the consumption of significant tranches of labour time underground.

The first account takes place in a development end, essentially blasting a tunnel to serve as a haulage for rolling stock between two of a three-shaft mine complex, the original shaft sunk having been sunk forty years before and having served its purpose.

The second of these two accounts occurs in an area where ledging is taking place, the process whereby the working stopes are cut into a strike gully to gain access to the ore-bearing reef. In both cases, part of the hanging wall had collapsed and neither was readily secured by the traditional standard means of roof bolting. This occurs when the hanging wall (the roof) continues to fall and remains insecure.

Neither case aims at being representative of mining, for when things are going well mining is boring, routine and monotonous. It all too often does not go well. Yet both accounts are typical insofar as the jobs they entail are germane to valorisation in the mining labour process cycle: supporting, drilling and blasting. All other mining processes and activities, from assaying to the selling of the refined bars of 99.9% pure gold, are subject to and dependant on this cycle.

On the deep level’[341] mines in South Africa a vertical shaft is sunk in order to strike the reef with tunnelled haulages then developed horizontally to access the reef at different,

[341] The term ‘deep level’ has changed over time. Already in 1897, depths of 3000 feet (approximately 930 meters) were envisaged (Oxley 1989:51). Initially it referred to any mining operations underground as opposed to outcrop mining. It was specified in 1945 as denoting a depth below 8500 feet. The term was legally defined in an amendment to the Income Tax Act (No 31 of 1941) in 1956 as anything below 7500 feet (Oxley 1989:74) precipitated by the establishment of Western Deep Levels, which initiated ‘a whole new dimension to mining, not least for the mineworkers who receive scant attention in the official accounts and which mine is

ever deeper levels. These shafts where the accounts took place, Western Deep Levels, were designed by two brothers, Alf and Hermann Seelos of the Mining School at the University of the Witwatersrand; one to strike the Ventersorp Contact Reef at approximately 2000m and one to reach down to the Carbon leader at 3150 meters and where these events told here take place. (Oxley, 1989:84-6) In 1961 the horizontal tunnelling haulages between shafts Numbers 2 and 3 at 66 Level accessing the Ventersdorp Reef were dug from both shafts in three shifts of eight hours a day. The events related here, at 100 level, 2914 meters underground, forty years later, further accessing the Carbon Leader, mirrored this operation. Regarding the total aggregate of social labour time, it is perhaps worth just noting that on this mine, since the inauguration of operations by Sir Ernest Oppenheimer in 1957 until 1961 'work had not ceased for a moment, by day and night' (Oxley 1989:114). In this period, as a previous chapter showed, workers would have been working a six day working week, with a minimum of 48 hours and it is to a microcosmic slice of this temporal regime at the rock face that this account now turns.

The account is taken almost verbatim from field notes having spent a number of shifts in what is generally the eventless routine of a development end. In 1999 this development end was to be the new haulage linking Mponeng and Tautona mines, previously Numbers 1 and 3 Western Deep Levels. By now, a decade later, hundreds of trams have hopefully safely travelled beneath the protective 'sets' which were erected to overcome the problem about to be described.

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the site of those noted here. The workers, except for the leading shaft master sinkers, a CJ van der Westhuizen and ER Brune, neither white nor black, received any acknowledgement in the official acknowledgments issued by the Public Relations Department of the Anglo American Corporation of South Africa Limited on the formal opening of Western Deep Levels in 1962. Appreciation expressed for the 'combined efforts of many people' does not quite qualify (Oxley 1989:129-30). The term refers in contemporary mines to anything between 3000 and 3500m with 'ultra deep level' referring to anything from 3500 to 4500m.

The situation

The development-end[342] of the haulage[343] is 'holing out'[344]. It is around 3000m below collar[345]. The face and hanging wall[346] are not solid, although the side-walls of the haulage under construction are fair. The haulage is intersecting with either an old reef-drive[347] or stope incline blasted years before. Closure is total[349]. The strange-looking vegetable-like, reddish-purple protuberance in the striated rock is a crushed pack[350]. The air is still and humid: there is no ventilation.

The mood

The development team, at it for month now, did not get their 'call'[351] and have consequently lost their bonuses, are not co-operating well as a team, the workers in a sombre and obstructionist mood. Five shifts have been lost: 5 shifts with a

[342] Development tunnels of different dimensions are excavated in order to gain access the ore-bearing reef. The 'end' is literally the point at which the tunnel is actually being excavated.

[343] A haulage is a tunnel in which rail tracks are laid for rolling-stock to convey men, materials and ore. Certain mine designs ensure that haulages convey either ore exclusively, or men and materials.

[344] It is often said that mining is simple. Yet it is difficult to get it right. Snags, incidents and anomalies beset the process at seemingly every turn. The mining labour-process is consequently characterised by its uniqueness, despite the repetitive nature of many routine asks.

[345] Depth is measured from ground level, or the 'collar' of the shaft on surface, downwards.

[346] The 'hanging-wall' signifies the 'roof' as it is called on the collieries, or what is the ceiling in a modern home.

[347] A mining technique where the haulages track the reef and the working areas for extracting ore are ledged directly off the reef-drive.

[349] Due to the immense geological pressures at work at depth, narrower excavations close up under pressure.

[350] Basic unit of mine support, constructed traditionally from timber, cementitious packs currently being widely used.

[351] The managerially imposed 'target' or specified production quota, generally measured in terms of face advance or square meters per man (working underground) that has to be reached in order to procure a bonus. Workers, at relatively recently established mining houses particularly, depend on the bonus to earn a living wage.

specified net surplus value producing target of 2m per shift makes that 10m lost out of the call of 40m required for the month. The miner loses R3000, the workers at grades 3-8 probably around R700. Flaming, the miner, was not happy.

The job

This is to be the second main haulage to Mponeng Mine[352] in 2006 after Tautona Mine's[353] main shaft-pillar has been mined[354]. All the ore from Tautona will then come up through Mponeng. It is a job to be done as part of long term planning and somewhat off the beaten track of day-to-day operations.

The waiting area

It is early. There is no rush. David, the miner's assistant[355], reminds the men of the eight steps to 'making safe' - a part of the Early Examination Procedure[356]. It is now past seven-thirty. There is no miner and the shift-boss has yet to arrive. He will not in fact arrive today: there is a pre-planning meeting with managers. The men stir themselves and traipse into the tunnel in which they will spend the rest of their eight hour shift.

[352] Mponeng, Savuka and Tautona are the new names for the old Western Deep Levels No 1, 2 and 3 shafts, until recently the deepest mines in the world, eclipsed by Groot Noligwa, all being Anglogold Mines.

[353] The life of mine is coming to an end for Tautona Mine (WDL No3 East shaft), an old three-shaft mine, being sunk, as noted, in 1959 and having gone into production in 1961.

[354] The final, risk intensive mining operation conducted prior to the closure of a shaft.

[355] Still called a 'spanner', short for the now obsolete 'spanner-boy' that replaced 'piccanin.' See Leger (1992:17) for the etymology of the latter term.

[356] A series of obligatory procedures designed to ensure safe working practices to be executed upon entering working areas before commencing with production tasks. This goes back to at least 1897 (Katz, 1999:95) Currently, you stay in the training center as long as it takes until you get 100% for the test which incorporates, among a whole series of other things, these regulations. As visiting university-based academic researchers, Phakathi and myself literally drilled the syllabus into each other behind a building in the Training Center, petrified we would disgrace ourselves and our institution, the University of the Witwatersrand - originally the School of Mines - and not be able to go underground.

Loading rock

Work starts slowly. Bobby, the team leader, brings the rock-loader[357] along the track, its thick, green, lazy snake of an air-hose unfolding awkwardly in its wake. The 'Boesman' starts to snort its pneumatic air as it levers into the rubble at the base of the face, throwing up its jaws to partly swallow its takings into its mobile scoop. This procedure is repeated four or five times before the ever agile and busy hands at the noisy levers control the tossing movement of the load over the machines' back dumping the load on to the side of the track. Bobby continues to operate the controls from the side, shunting the loader back and forth. The pile of irregularly shaped and sized rock resists the rock-loaders' powerful, compressed-air powered hydraulics.

Washing down and hand lashing

A worker moves forward with a hose and the face gets washed down, revealing the misfired sockets[358] of the previous blast. The face is carefully inspected, the cap-lamps of the men strobing the still dripping surface. Satisfied, Bobby leads by example and starts to lash[359] the remaining rock at the foot of the face. Four Camlock props, the long development-end temporary supports, twice the height of a tall man when extended, get brought to the face. Men take up shovels and start to lash down to find the hard foot-wall. The rounded points of the shovels do not bite deeply into the unyielding rubble. It takes time: the foot-wall is thirty or forty centimetres down.

Erecting temporary support

The temporary netting to be held in place by the rubberised platforms of the four Camlock props refuses to co-operate. The entire team uses anything available to hold the fence-like netting in place as the props are put into position, including using a brand new plastic warning sign that also refuses to oblige a desperate attempt at employing something patently unsuitable for the job at hand. Eventually, after much unproductive exertion[360], the supports are installed in a neat

[357] The men refer to the rock-loader as a *Boesman*.

[358] A hole left over from the previous blast that cannot be used again. See below.

[359] The hard manual labour of removing loose rock with a shovel, traditionally performed by the *amalaisha*, the lashers.

[360] A drilling platform and notched charging sticks in the end would have saved the entire team from executing an awkward and time-consuming maneuver, working haphazardly at full stretch overhead. As usual, in the endemic absence of appropriate equipment, men are forced to *planisa* – Fanakalo for 'making a plan'.

rectangle. I ratchet up a development-end support. Not all the safety handles are pointing in the right direction as per the regulations, but the supports at least are in. The shift-boss, Gavie, later in paying his routine visit to this workplace alerts Bobby to this common infringement of safety standards.[361]

Marking-off the face

Bobby starts to 'mark off' where the holes must be drilled. He perches on a small make shift ladder roughly constructed out of mine timber. It is the only means on site of gaining access to the hanging. He attaches two slender chains to tagged metal spikes in the hanging wall. The chains attached to these tags, hammered in by some or other geologist's assistant, marked off by two circles, painted in blue, are drawn taught with two pieces of rock tied to the ends. This provides Bobby with his line of sight as an older man, who seems to emerge out of nowhere and is not part of the team, and who marks off the spots to which Bobby directs him. The brush, encrusted with red paint, is attached to a long charging stick. The red paint now gives the face its drilling grid or 'burden'. Bobby completes the job by painting lines between the spots the older man has marked. A laser gully-marker[362] *would make the job easier and more accurate.*

A moment in social relations

*Utmost courtesy is exchanged between the two men as the one hands over the long stick to the other. It is handed over with two hands and likewise received, much as if it were a ceremonial mace. Bobby says "**Dankie Ntate**"*[363]*. "**Morena**"*[364]*, the older man responds. **Ntate . . Morena . . Ntate . .** the two men respond in turn, uttering expressions of gratitude and acknowledgement. The older man, gray-bearded, quiet and distinguished, looks sixty. He is a team leader from another section. The men are equal in the hierarchy of the mine, but perhaps not elsewhere. There is a rare dignity in this moment, cutting directly across commonly held opinion that miners are necessarily rough, crude and uncultured men.*
Barring down

[361] The safety handle must point back down the stope for easy and safe release of the prop in the event of a dangerous hanging obtaining when it needs to be removed.

[362] The 21st Century worker requires 21st Century tools. The laser gully marker, only ever seen by this writer on the coal mines seldom seen, is one such instrument. The marker draws a clear infra-red line across hanging walls and faces to permit pin-point accurate marking to within a degree.

[363] Afrikaans and Sotho for 'thank you' and 'Father'.

[364] Sotho for Chief, the highest form of respect.

Only now does barring[365] take place. It is the first pinch bar I see with a gasket, the safety requirement for pinch bars. It is aluminium and hollow except for the tips, but still heavy and becomes considerably 'heavier' with use. Accurately thrust upwards, its sharp point repeatedly hits the same spot over two metres overhead as a mineworker brings down a suspect bit of rock from the ever soft and retreating hanging-wall. The bar is allowed to crash down onto the foot-wall as bits of rock come tumbling down. That saves a little muscle power. This arduous, energy-sapping process continues for half an hour.

Preparing the rock drills

Three machine drill operators prepare their water and air-driven tools, the connecting hoses clamped with bits of wire, twisted on with a nail, the working-standard underground. 'Pliers would lie around and rust - and nails are cheaper', a construction foreman argues.

A rock drill operator[366] loads his drill with grease.[367] The thread of the sturdy metal grease-bottle loosens itself as he tries to undo the cap to insert the grease, until he grabs a pinch bar as a lever to hold it steady. The grease makes the procedure tricky. It is a routine bit of manual dexterity. It gets done hundreds of times a day. It's just one of the standard things to do before getting on with the main job at hand. One by one, the operators gun their drills, breaking the silence and sparking the development-end into life, before advancing to the now safer face. Cleaning sockets [24] and drilling

[365] "Barring down", removing loose rock from side-walls and hanging walls is central to "making safe" that is undertaken before work starts in any area underground, stopes and development-ends most particularly. Technically this should have taken place before the team leader started up with the rock-loader. The pile of rock at the face complicates barring – the pinch-bar is long and unwieldy as it is, stretching over a couple of metric tons of rock does not make for easy going. Operating the rock-loader puts its operator a little back from the face, yet not protected by any permanent support i.e. roof-bolts in this instance. Erecting temporary support is not easy when the foot of the face is clogged by loose rock. Men here chose to first remove the loose rock, thereby putting themselves at risk beneath a dangerous hanging.

[366] The Mine Overseer later refers to drillers as *machines*, the *boy* of the old term, *machine-boy*, seemingly having been dropped. There are at least two words for everything in this world of mining, referents in Fanagalo underground stubbornly clinging to their historically designated objects.

[367] On an old mine, the large 25litre grease tins find their way to surface and with the addition of a makeshift wire handle are used to carry overalls, boots and gloves and other PPE to the washrooms to scrub. On a new mine they were nowhere in evidence.

The miners' assistant has spent some time with a long piece of wire cleaning two sockets, previously drilled holes, where bits of blue plastic from the explosive have got left behind. These holes are encircled in red and get plugged to signal machine-drillers to stay away from them. There is no two-way blow-pipe in the end, the relevant equipment required to do the job properly. With or without the proper equipment, you do not drill into or drill through a socket, ever.

A man got half his face blown away on Tuesday for doing just that. The inquiry took up a chunk of a whole phalanx of managers' time this week as a result. A faceless man - not a man without a name, a man without a face - lies in a hospital somewhere. It seems he might make it. For there has been no Red Note Message posted since then. From the sounds of it, his survival is nothing short of a miracle. It did not sound nice. It was in the open corridors of the mine: Net n' halwe kilogram plofstof kan jou wegblaas.'[368]

It is an old story.

In this respect the potentially fatal dangers of the mining labour-process has not changed in almost a century.[369]
Drilling continues routinely with 1,5 meter drill-steel 'jumpers' for two and a half hours, well before the end of the shift by which time the face has been charged up, the temporary support removed and workers move back to the waiting area at a leisurely pace to make their way back up to surface.

Work stalls

The next morning I am at the waiting place just before seven, having caught the 5.15 cage down. There is no Bobby, no miner, no shift boss. The team trundle

[368] *'Half a kilogram of explosive can blast your face away.'*

[369] Enforcing the rule of not drilling into (or near) sockets has yet to be achieved. Like motor vehicle accidents, a miner once soberingly said, 'people take risks' and that will never change. In an unpublished conference paper by Matthew Smith (1990:20: f49) the following account was drawn from court evidence noted in a Chamber of Mines Health and Safety Sub-committee in 1913. *" I am a machine boy of the boss who was hurt yesterday. I saw holes in the face that required plugs where we worked yesterday. The boss did not plug these holes with wooden plugs or any sort of plugs. The hole I pointed out to you went off when the boss started to drill there. That hole was not plugged. The boss just looked at the socket and then started to drill to the side of it. I saw the jumper going toward the socket. I said 'boss that is an old hole'. Fanele also said so to the boss. Then the boss said 'soeka' (get away) and swore at us. The boss drilled two strokes when the explosion occurred, killing one boy and injuring two others and the boss. I have seen the boss clean out holes with a scraper and tell us to go on drilling in the scraped out socket; if we refuse he does it himself. I walked back when he started to drill because the boss said 'soeka'. I had just sat down about 10 feet away from the face when the shot went off".*

down the cross-cut into the development-end. The face is freshly blasted. Judging from the length of an old roof-bolt now sticking out of the face provides a handy, but unusual way of measuring the face advance. I track the direction of a thin band of striated rock that disappears in a rounded area of coloured rust. I retreat from the face as a worker begins to hose down. It is seven-forty exactly and work, without any supervision has just begun. There is consequently no methanometer[370] *in the end and no test for gasses conducted. There is no ventilation*[371].

The water brings down streams of shattered rock away from the very uneven face. The miners' assistant, David, washes down thoroughly. As a new safety measure all new lamps have a luminescent band around the cord, attached with cable clips at both ends. The cords are longer that the ones they have replaced and tend to get snagged until men find a new way of dealing with them. Joe has made a loop in his, making him clearly visible and identifiable by the shape of his yellow-green luminous loop.

A different voice, full of gravel, signals a new-comer's arrival. There is an edge in his voice. It is Bobby's fellow team-leader from yesterday. He has obviously come to inquire what is going on. Or rather perhaps why nothing is going on. He stands, hands on hips, looking back the way he came. A trickle of stones from the face pushes me back to where the group of men sit idle. The rock is talking[372]. *That explains why the mineworkers are doing nothing. The old man spots something, picks up a pinch bar and gently prods at a couple of pieces of hanging he does not like the look of. It moves, but apparently insufficiently to cause him further concern. He leaves.*

A little later a second man comes walking down towards the group. There is something different about him. Above both overall pockets a luminescent band flashes white.[373] *He spends a minute with us. He too, it seems, has come to see*

[370] One of a range of instruments used for detecting principally Carbon Monoxide (CO) and Methane CH_4.

[371] A development-end is ideal for the build-up of noxious gasses. Strong ventilation ensures re-circulation of air minimising accumulation of gasses. The mine did not have a reputation as a 'fiery' mine, team members are not required to carry testing equipment, consequently the procedure was ignored. While gas initiated explosions are relatively rare, they are inevitably extremely serious, the Kinross disaster in 1988 and the recent explosion at Mponeng in which there were 19 fatalities being but two examples.

[372] Jean Leger's thesis entitled *'Talking rocks'…* (1992) is essential reading for appreciating the tacit skills mineworkers employ in their working regimes underground.

[373] The new over-all worn by miners involved with *Projek Katleho* are designed with luminescent flashes for greater visibility.

what is going on here. As he walks away, across his back two larger bands flash white in the pool of light from a cap-lamp. His lamp cord strikes a diagonal green line down his back. This man is not to be readily missed in the dark.

Lights flash down the tunnel. The shift boss has arrived. It is eight-twenty.

A physically-working shift boss

Gavie, the shift-boss jumps onto the job, pinch-bar in hand. Intersecting an old mining site has complicated this routine, straight-forward job if there is such a thing in mining at depth. The crushed bulbous old purplish pack is now further exposed. It seems to be supported by a clustered family of grayish white rock in which the reef can be seen clearly running in a number of skinny, almost disappearing, bands. He does not make any headway and elects to position the drill to drill a hole. The drill bit, high up against the face and finding no purchase, slips continually. It's like trying to drill into a tiled kitchen or bathroom wall without having the correct drill bit or having gently marked an entry point with a center-punch without cracking the tile.

Gavie, with a keen worker now helping to steady the rock drill, tries a second time to drill directly through a smooth slab of gray rock. It is the lower of the two large single slabs of rock that jut out at an angle at which the old stope must have been blasted. Directly above the gray slabs, the rock, a darker gray, is highly stratified and streaked with white. A pure white fault running two meters almost perfectly downwards, vertically splits the face and points to a larger space of pure white that is the epi-centre of a whorl of rubble and bits of crushed wood and compressed pack, clearly identifiable as discrete bits of mining timber.

To the left of the white-centered whorl is an opening, but spiked as in the centre of a crystal, shards pointing inwards, a light, white gray. Below, all the way to the foot-wall, there is a veritable geological jungle with no pattern, no order, no symmetry. The haulage must intersect this old, closed up mining reef drive. At the base of the face is a large area of rust having seeped through from the old diggings.

The second drill hole promises to be more successful than the first that closed around the jumper[374]*, despite having been drilled into a single clean slab*[375]*, though roughly four metres up. It is not successful. It is ten-to-ten. The shift boss has now been at it for an hour and twenty minutes, prodding away at the face to*

[374] The drill-bit, referred to generally as the *jomper*.

[375] Behind this slab, promising solidity, was obviously more loose crushed and previously broken rock that prevented the drill-bit a clean hole in which to charge-up, blast and bring down the loose rock of the old mining operations.

find solid rock into which to drill. Two workers are starting to drill on the other side, close to the side-wall, though not as close as I know the miner would have liked it. He needs to open up the face on this side and regain his 3,5m by 3,5m shaped haulage.

It is half-way into the shift and progress has been slow. Gavie would be grateful if he could get his permanent supports - the roof-bolts - in and sling a temporary strapping under the treacherous hanging wall, he explains, in order to protect the rock drill operators from the small stones that periodically come down without any warning.[376]

As we stand there a larger bit of rock comes loose and falls at our feet. 'Not always so small', I remark. 'That's the problem', Gavie responds. The soft rock of the second hole bites the drill bit and the jumper stays there, stuck fast, protruding from the face like a latter-day Excalibur. There is already one stuck in the foot-wall a little way back. Having brought down a huge chunk of rock in the vicinity where the third attempt at drilling a new hole is now being made, it starts to look like this may too have to be abandoned, the jumper periodically sticking fast and resisting pulls and tugs on the drill or any angle its hydraulic foot is made to assume to align the drill with the long drill-bit.

A fourth hole is attempted in a different position to try and gain some purchase. If a worker thought the shift-bosses exertions were initially for my benefit, this certainly seems so no longer. This job needs to get going. The bosses, the mine overseer, section manager and engineers are going to be down here on Monday morning. Men are now attacking the face with a vengeance. Using a 2,6 m jumper, its bit sliding around before biting into the rock, two men hold the drill steady, supported by the extended hydraulic foot, now pressing the drill into the face, out of reach of the men who operate it. A sky-leg extension brace has been attached to the bottom of the hydraulic foot, the drill now being controlled by squeezing the hoses to regulate the air power. The face now gradually swallows the length of the bit. A second extension is attached, the drill now, almost elegantly except for its periodic lurch and swaying motions, approaching the hanging-wall, a good four meters above the foot-wall from where eyes are glued to see whether it is going to go all the way home. Suspended in mid-air, the rattling roar of the stubby drill continues to command the attention of all eyes. There are no wandering pools of light from any of the cap-lamps. It is a good smooth hole, the first of the shift.

The drill comes down evenly, behaving itself impeccably. Gavie stands up from where he has been intently watching, signaling it's time for him to go. That signals he is aiming to surface just before twelve, Gavie having done his four hour inspection and supervisory shift underground. On surface there is much paper

[376] See Leger (1992:17-21) for his fascinating account of workers tacit skill in 'reading' the signs of falling dust and stones as precursors to falls of ground (rock-falls).

work to be done. Workers prepare for another hole, gun the drill and again spark the working area back into life, this time drilling almost perpendicularly into the hanging-wall on the opposite side of the face. Gavie does not leave, but points and gives directions.

With the hanging-wall coming down all over the place in the area of the drill hole, the two operators now handling the rock drill struggle to keep the drill steady to consolidate its position in the hole just started. With a pinch-bar, Gavie picks away around the face at the drill bit to prevent the loose rock from seizing on the bit. The face disintegrates in a white, powdery, fine-grained mixture of little stones and dust. This does not make for a good hanging wall. Gavie, back in the fray, struggles with two workers to get a good position for hopefully the second successful roof-bolt hole of the shift. The concentration of all the men is fierce. If a researcher's scribbling ever bothered anyone before, it is certainly not now the object of any attention. The shift has simply become too much of a head-ache.

It is eleven-twenty. The drill stalks the rock-face like a wild upside-down metal heron, perfectly framed by the temporary supports. The jumper has now bitten into the rock and appears to be proceeding smoothly. Gavie give the thumbs-up sign to the soaked operator, the connections from drills rarely free of spitting water, apart from the lubricating water continually streaming out of the hole onto the men at this angle.

The drill suddenly halts. I hear a groan of despair, everything suddenly falling quiet, but the drill bursts into life again and a second brace is attached below the first on the already fully extended hydraulic leg. The heron stalks its prey again, high up against the face, stalking the black vault, pecking insistently at its surface. It takes dexterity to control the drill, four meters up in the air, getting the angle right by sometimes prodding the knob for the hydraulics with a pinch-bar, pulling on the pipes and starving or feeding the drill its plant air power supply by choking or releasing the hoses.

The rest of the team emerge from the darkness down the haulage bringing the equipment for plugging the holes for inserting the roof-bolts. The time for the shift to start moving to surface is rapidly approaching. There is still a little way to go before the drill bit is properly embedded in the face. The hydraulic foot, with its two extensions, gets moved closer to the face to ensure it lifts the drill to line up with the long jumper now almost completely embedded in the interminable rock. The nose of the drill now nibbles directly at the face itself, signalling another successful hole securely drilled in this messy face. It again has the attention of all eyes. The relief is tangible as it sinks gracefully down on its single leg. It is now eleven-thirty and the shift is dying fast. Men crushed[377] *before six and aim to be up*

[377] The crush is where men traditionally push and shove as they queue to go underground, hence the name.

just after one, never before a full seven hours underground, so aim to leave to travel and wait roughly an hour at the turnstiles and the shaft stations before they get to surface.

Gavie tries another tack. He drills into the ugly brow[378] *that has been worrying him. Accurately, on the spots he wants, he drills two holes. With some careful barring, at full stretch overhead, everything starts to come down with deadened thuds alternating with the clash of hard rock on hard rock. Men stand back.*

Gavie retreats down the end for a break, where it is cooler, as everyone does when it just gets too much. He sits, open-legged and hunched, on the tracks dipping into his plastic tog-bag, only occasionally issued by the mine in these times of drastic cost-savings and cut-backs, and offers excellent home-made sandwiches. It's a treat. They are stuffed with game left over from last week-end's braai. He is generous, again like mining men were always found to be, virtually without exception.

It is twelve thirty and the roof-bolts are being inserted. Plastic wrapped cement pellets get shot into the drill holes under pressure from having been inserted into the barrel of an air-hose powered blow pipe, its lever jerked forward and backward to gun the pellet in deep, hard and fast against the one that went before. The position is awkward, but stretching up, precariously balanced on the wooden ladder, supported by a prop and with the help of the gang, eventually Gavie gets the roof-bolt hammered home. He does so with a length of pipe, flattened from having made repeated contact with the rounded edge of many a roof-bolt's looped end. A shorter man could not have done it. Everyone on the shift had tried, but after some light hearted banter, being taller it ended up as his call. 'Skof-baas!' - he shouts in glee as it goes home.

Meanwhile in the end, barring continues. Now there is a lot of rock on the ground and the hanging is even higher than before. The end is 'holing' out badly. This obstruction was only supposed to have been encountered sixty metres further down, according to the survey plans. Hence the bosses coming down today. Flaming, the miner who had been off for two days, has sent David to the West side to look for vent pipes.[379] *He'll just take a couple off the other side if David can't find any.*[380] *He has been begging for them for months, he claims.*

[378] An unsupported hanging, generally marked in a zig-zag pattern.

[379] David returned empty-handed.

[380] This is what happened, vent pipes from the intake side were simply removed and attached to the exhaust side in order to be seen adhering to regulations that ventilation is no more than fifteen meters form the rock face.

He had told Gavie it was going to 'hole'. There was black water, a jumper had got stuck in the foot-wall and there was then the evidence of the pack[381]*. He had told Gavie. The captain*[382] *should call regular planning meetings.*

Flaming has his eye trained up high, six meters up at least, his hose following the line of his gaze as he hunts down suspicious hangings. There is a steady fall of rock, half-washing, half-crashing down.

Gavie arrives with the bosses. That means it must be after eight. It is in fact eight-thirty-three. The Overseer is there, a rock-mechanic trainee, three others who came to look and the Section Manager whom Veldman, the Mine Overseer called Meneer[383]*. There is discussion to which no one else is party. Gavie stands within earshot, but is not part of the initial deliberations. White overalls now dominate the end, cap-lamps strobing importantly all over. Veldman stands with his back to the face. He is in command. He wants sets erected. He wants six Camlock props for temporary support. The men move closer. There is discussion in Fanagalo. There are objections to the number of props the Overseer wants. Flaming asks no questions and is not asked his opinion or any questions at all for that matter. He had predicted as much: that his views would not be taken into consideration. Gavie acts as middle-man. He has already ordered the sets, the 'eight-foots' lie next to the track. The keen worker interjects and wants to know why six props are needed. For the question is who is going to put them in.*

Standing feet akimbo Veldman stresses his point. There is a strident tone in his voice. 'When were you last at school? Go back to school. One 'machine', two support, one 'machine' two support, one 'machine' two support' he counts out the relation, according to regulations for the number of props per machine driller. He is adamant, emphasising what he wants with rigid fingers stuck out in front of his chest in case he was not properly understood. Veldman is known as an excellent Mine Overseer.

Workers disagree and shake their heads. Flaming later gets his frustration off his chest to a researcher who is all ears. 'Where do six props go in this area?' He gesticulates as he asks rhetorically. The standard is that permanent support - roof-bolts - not be further than 3,5 metre away from the face. Temporary support are to be a metre apart. 'Where are the jacks to go? It makes no sense. There is no room. What about the drilling platform, the sides must open. You must first remove the

[381] These basic signs indicated to the miner that previous diggings, anticipated later, were about to be encountered. Taking such 'signs' into consideration, generally first observed by men on the job, would have significant overall beneficial effects on a number of levels, safety and productivity most particularly.

[382] The name still used for the Mine Overseer, the highest-ranking official underground.

[383] 'Sir' in Afrikaans.

jacks, then wheel in the drilling car and bring it up to the face and re-install the jacks. Who is going to do that? Workers want to know who is going to erect the supports?'

Gavie tries to keep the workers quiet and to back off. The keen worker leaves smiling, shaking his head. He goes to busy himself. The discussion continues a while. The keen worker bursts open the air hose to clean it of water as the discussion continues. Veldman glares at him with a hard, dirty look. Gavie gestures to shut it off.

As I talk to Flaming, the men disappear. They considered there to have been sufficient barring done. Flaming calls them back. Bobby the team leader wants to bring in the loader. There is a lot of stof on the foot-wall. Flaming insists there needs to be more barring done. A worker takes the bar and insouciantly sounds it against a large solid piece of rock. It was as if he wanted to get a clear sound and show Bobby right and Flaming wrong. It is an odd action when barring, but not when 'sounding' to listen whether the hanging is solid. But there was no good strong clear sound. Instead, a whole part of the hanging wall - just at the touch - comes crashing away in solid chunks. Flaming gestures downward, once, twice, a gesture Bobby, though an older, sweated and more experienced man, is forced to acknowledge. Bar! I retreat to write up. Rock comes down again. Sporadically a spark flies from the impact of the pinch bar, a slow and lazy arc, staying alive like the final fall of a burnt out fire-cracker.

The feisty Flaming, dwarfed against the holed-out face, prods his lance-like bar at the none-too-solid rock. There are a few tons of rock on the foot-wall, two loaders worth Flaming later tells me.

Now it really comes down with a thud that reverberates along the rail tracks along the foot-wall. A man whistles the whistle expressing both amazement and surprise, but also relief. A few men laugh, somewhat too loudly I thought.

Now again. A man says 'Hau'! [384] I think they know had Bobby got his way, they might be working underneath there now.

Men could have got injured, almost definitely seriously, had they got caught under the hanging that came down. Flaming, a step up in the hierarchy, won out against Bobby who, pushed by his men, wanted to start drilling. His judgement call in this instance was wrong and he recognised it. The men had to acknowledge it. The unpopular Flaming, rude and crude, had taken the right decision, thereby maintaining his authority with a fractious group of men who just wanted to get on with drilling - for therein lies the bonus. Despite the team-leader having longer

[384] A common exclamation expressing surprise.

service than Flaming, it was the miner who had been most intently engaged in the conceptual work at the face. Everyone barred that day. Flaming had not been coasting, nor had he left the work to the team, but had ended up demonstrating his superior knowledge in this instance.

The team moves off to get the sets[385] *that must be erected. The hanging wall has become too high, it's not stable or safe and protection is required.*

Three days later

The set has been built, with study steel beams set in concrete, topped with 'eight foot' long wooden beams. Gavie and Flaming discuss the job, pointing at the face. Flaming has his own ideas. Gavie points out parts of the face. The miner and shift-boss discuss where it would be ideal to put in the supporting roof-bolts. It's a job for the sky-legs.

Gavie and Flaming stand beneath the safety of the set and look up at the face again. Flaming goes for a drink of water. Bobby and Gavie now talk about the job as to where to try and get roof-bolts in. They occupy the frontline of the attack against this stubborn hanging. Gavie takes a break as a worker replaces the frontline. The back-line of men now move forward and Bobby gives instructions. Two machine-drillers are now staring up at the face, deep in discussion. One returns, now expressing disquiet to Bobby. The machine-driller does not like it. Neither does Gavie like the situation and who now takes up the lance-like pinch bar. He shortly spots a weakness and has caught the point into which he levers the pinch bar. A rumble of rock hurtles downward onto the ever growing pile of broken rock on the foot-wall.

In the meantime pipes get drawn up. Davie continues to prod and test. Light gray shards now fall, more lethal than falling glass, just as sharp, but weightier. Flaming is now, again, in earnest at the face. He must be, for he wears gloves.

'Swaai daai klip, hy's los'[386] *says Gavie to Flaming. He puts the side of the pinch bar around an edge of the suspect, jutting bit of rock and pulls to the side. It cradles off its perch and comes down crashing down. Men instinctively move back.*

The drill gets rigged up. A ganger takes up the third row. We stand in silence, the hoses hissing more quietly now. Gavie is still in position at the face. Now the

[385] Protective steel girders sunk into concrete with wooden beams overhead to protect workers - and the rolling stock to travel beneath this section in time to come - from falling rock.

[386] Swing that stone, its loose!

machine operator holds the point of the steel drill bit against the rock, unusually high up where the shift boss wants it. Gavie instructs with a rather steely eye the man who has edged nearer out of the dark to do the job. The ganger helps Gavie steady the drill.

Gavie gives a short sharp jerk to the lever on the drill and a chink of rock falls, almost in slow motion, to join the pile below. Gavie now launches his bar against the face again. A big rumble now feels against our backs from the cross-cut: earth moving seismicity. Gavie stops and listens and whistles. It was a big one.

Gavie has been working hard at the face. Bobby now moves toward the face, and takes a very long and careful look. Gavie moves up close behind him, his hand resting on Bobby's shoulder and points out a spot high up. Flaming's voice travels down the tunnel some time before his small tight frame comes briskly into view. There is a bad slab of rock up in the hanging. 'Gavie wil nie kanse waag nie'[387]*, he says as he comes up to me, reading his shift bosses' interaction with Bobby. The frontline of the attack now stands in order of rank, shift-boss, miner, team-leader, crew. The men stand in single file three deep behind the drill. 'Het jy daai bomp gehoor?*[388] *Gavie asks of Flaming who nonchalantly responds that he was busy 'behind'.*

Eyes are ever upward. Half a dozen pools of light or more strobe the face. What's loose? Where? What's not? The job is not easy to teach. The bit jams and the drill comes crashing down, loosening the hose that thrashes around, before a ganger jumps at it and cuts off the air. With wire it gets connected up again. Men stand around and breathe in the break, concentration now dispersed. This is work, but not productive, payable labour time.

Drilling starts up again. Gavie is again at full stretch guiding drill steel. Flaming clambers up the set and from his vantage point leans over and guns the air powered throttle of the drill, the bit holding steady for a while before sinking its head into the rock, the face seemingly still not firm enough, not solid enough. There is a pause. Then the drill fires up again - loudly - holds its grip in its entry point and noisily this time and without interruption, bites into the rock.

Flaming retreats and Gavie again jousts against the wall, trying to stay within the protection of the set. Tired, the bigger man leans heavily on the shoulder of the other as he takes a well-earned break and together both men, yet again, peer up at the looming face. Bobby calls for reinforcements. Three drillers come up to stand in a row.

[387] Gavie does not want to take a chance.

[388] Did you hear that bump? (seismic event)

Another time the drill starts up with the wall trying hard to bite back and hold on to the intruding steel. It is withdrawn by series of tugs, this way and that, then falls somewhat clatteringly, but now still and silent against the rock below. Discussion now takes place urgently.

Now there is a really large 'bump' directly overhead, onto the set above, it seems, that sets Flaming and myself scampering for cover down the tunnel. Two managers have just arrived. One clasps his hands together and gestures in appreciation at the set and the safety is has afforded. They are here five minutes or so or less. The place does seem bigger now with less attention on the face. The tall Gavie even seems dwarfed by the set, standing on lower ground in the middle of the tracks.

Flaming, standing momentarily for long seconds unprotected, spars again with a big, friable, loose looking patch of rock high up on a ledge before jumping back under the protection of the set. All miners take risks. Davie did not like the manoeuvre. The ganger appeared not to have batted an eyelid. This time the shift-boss really did not like it and said so, but Flaming continued to take the risks anyway, with Gavie entreating him to be careful.

The white men - the researcher included - leave earlier than the shift, but much later than usual. Gavie complains that he worked too hard today. His arms are sore. Six hours to drill one hole. I tell him that the events in his development end will get written up to try and show how much energy and time can be consumed for so little reward. He sighs. 'It's not so easy to do it safely', he later says to me on surface after the shift as a small group of men crack open beers out of the boot of a car in the parking lot.

2 A difficult ledging operation.

Access to the ore bearing reef is gained from tunnels or haulages by means of a series of strike gullies blasted at the angle of the reef. A 'ledge' then needs to be blasted on both sides of the strike gully and secured by means of a series of gully packs to gain to enable stoping in both directions, 'up-dip' and 'down-dip' in order to follow the angle of the reef of the Witwatersrand Basin which, in distant geological times, which as particles washed down rivers to an ancient sea and assumed sedimentary shape, as if contained by a massive shallow dish.

The situation was variously described as 'critical', 'bad' or 'dangerous' and was considerably beyond the mine safety standard specified for the height of roof hangings. I refer to the area as the 'cavern'. Nature had reasserted itself against the structured

engineering of evenly spaced support packs and elongates (*madodo* props), running cables and wiring and general human working order due to an 'over-blast'.

Gold bearing ore (*stof*) was piled at the bottom of a gully, with rock strewn around the crippled winch; its electrical box lurched over to the stressed East side - evidenced by the splintering and fragmenting rock face. Shortly afterwards the section engineer instructed the stope to be developed down this side to release the evidentially mounting stress in the rock over two kilometers below the surface of the earth.

The wire netting in the travelling way held by a criss-cross of cables, hooped through the securing roof bolts, were bursting with the weight of loose rock resulting from the over-blast. An over blast occurs when blasting damages an excavation too nearby. A number of roof bolts had been dislodged, but remained partially attached to the hanging overhead in the travelling way, still attached to chunks of rock. From an engineering point of view they had done their job.

The entrance to the bottom of the gully was virtually blocked with piled rock, over which workers scrambled, up into the unsupported 'cavern'. Equipment and discarded material - ultimately destined for salvage - lay amid and between the broken rock. Orange and black hoses lay tangled. The broken rock, hard up against the curved face on the North, spilled down to the tracks of the travelling way and flowed into the steeper pile above to the South as the stope was being developed up dip at an angle of 25 degrees. It spewed out towards the winch on the East-side. The hanging at this point was somewhere between 1400 and 1700 mm. The 'cavern', part of its slanting, domed roof-hanging dripped with water seeping from visible faults, opened up to a height of over four, possibly five metres - an awesome sight underground. The mine standard specified a maximum of 2,6 m for a development area of this nature. Field-notes record the area as follows:

The cavern: 5pm Thursday 22April 1999

> *(We are) in a precarious 'cavern' in which nature seemed to have reasserted itself with a vengeance. Today nerves were frayed. The shift boss called this 'rough*

work' "Dis `n bietjie rof hier; dis `n vok op.[389]*" He looked anxiously at the barring away of tons of loose rock in this unsupported place at the base of what will be the central gully of East and West panels at 105 level. This deepest section on the East of the mine is represented by a short line on the seismologist's map at the mine offices.*

The team leader, Msole - a word which means 'soldier' in his language - was not happy. He had been at this for almost forty years and retired about two year later. His gang clung to the wall of the uncharacteristically shaped 'cavern' amid the tangle of pipes.

The support pack at the top of the 'cavern' where miners had previously asserted a semblance of order, was just short of 3m in height and bent like a bow. Today they had to regain control.

Regaining control: 4.25pm Friday 23April 1999

The 'cavern ' was coming under control with supports being installed - packs and Madodo sticks. The elongate is pumped until the stick makes a good ringing tone, pressurised against the hanging.

The bowed pack had shifted since morning-shift yesterday. Barring was taking place. Quiet Rock had to scream at a young ganger barring[390]*, in order to pass. Men hate to be interrupted while working. A driller threw an elongate back down the panel. He was at war with his drill and the rock and pipes close to where the winches were installed. The gully center-line was drawn by Quiet Rock.*

The 'cavern' hanging was 2,7m with the reef running along the hanging. Quiet Rock described getting the packs in as 'critical'. The next urgent job was up the gully where some Madodo sticks had got 'tired' and a winch bed had to be installed. The concrete bags were there, as was the frame. 'It would take a day to get it in - not two days,' he said.

Still trying to regain control: 10.05am Sunday 25 April 1999

I am back in the 'cavern' with Quiet Rock. It's at the bottom of the main gully between 105 East and West, each having five panels that have either just been started or are yet to be ledged to start stoping. There is still the pile of rock at the entrance to the travelling way. This travelling way is blocked, no loco can properly approach it, the rails at the closest cross-cut being six inches under water,

[389] It's a bit rough here, it's a fuck up.

[390] Removing loose rock from the hanging-wall with a pinch bar is what is referred to as the crucial process of 'making safe'.

with slime packed half a metre high against the tunnel walls, a hundred bags of cement destroyed in the process of a failed attempt to blast it clean with high pressure hoses.

The drunken tall pack has not moved its position since it skewed it's previously bowed, but symmetrical shape. The 'cavern' is now larger and has dangerously been unsupported for more than two days.. Two sets of packs on the loco trucks are backed up 30m down the travelling way. The spilt sets point menacingly into the tunnel like a porcupine turned inside out, spikes on which my glasses got caught and made a worker walking in front of me feel for blood when one of them nicked his ear as he passed. The tunnel is 'new' and the development team has yet to cut them off. They stick out all over this section of the mine.[391]

There is one, maybe two temporary supports in evidence. Part of the physical regime in putting in the supports is that you have to physically lash with shovels 30-40cm before you find solid rock. But because the rock loader, the 'Boesman', cannot get to the mouth of the 'cavern', due to the travelling way being blocked, the 'cavern' has not had its rock cleared.[392] *Men will not lash as in days gone by when there is machinery to do the job.*

The Soldier is himself, with an assistant, clearing a space a metre square in order to build a pack, a little more than the 1,6m mine standard distance from the previous one which is itself 40cm further from the previous one than it should be.The mine standard cannot consequently be adhered to as Quiet Rock did not get the number of support packs he needed in order to comply. This compromises the support structure and when sufficiently widespread is a cause of seismic activity and subsequent potentially lethal falls of ground.. The young assistant accurately hammers the point of his pinch bar at a ledge in the rock to disengage it to complete clearing the area on which the pack must stand at that strange angle between foot-wall and hanging. From a distance 3m away a ventilator with the diameter of a large fruit plate dish blasts air in their direction. It is the only temporary ventilation in the 'cavern'.

The two packs erected yesterday have not been pressurised.

So, because then of the transport problem the rock has not been cleared and no temporary support has been put up, certainly no adequate temporary support.[393]

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[391] I *was* horrified to see a loco driver having to duck them while busy negotiating his loco.

[392] It is easier to mark off the hanging and install roof-bolts before the gully is cleared, although I do not know whether this is standard practice.

[393] My only comparison is with the meticulous installation of regularly spaced temporary supports in the stopes. As the account shows, neither the shift boss or the section engineer were happy with the situation.

I had been near the opposite number of the big pack toward the gully side when the unmistakable shouts of a white boss were heard yelling for The Soldier. The sound of the white man's voice is urgent. He clearly wants The Soldier ***now****! The shift-boss and Section Engineer had just come down, traipsed through metres of water, squeezed past the two loco trucks and clambered up the rock that was previously hanging like the upside down car hanging. This pile had been added to by a substantial amount of barring.*

It's about 8.30 in the morning, perhaps a little later on this Saturday morning, three quarter - six hour- shift. Everyone hopes to be out by eleven, 10.30 some hopefully suggest. Everyone had clocked in an hour earlier than normal (i.e. before 5am) to 'work in' time in order to get a half day off.

*I stay in the shadows a little, hanging back, having noted that men always – or rather almost always – look up when another light approaches and the light falls on the spot under observation by its wearer. "What - the - f*** - is - going - on – here?? I don't follow the rest, so move nearer. The young moustached shift boss, ever clean and fresh in white, eyes me and seems to fall silent. Quiet Rock has also, it seems hung back, letting The Soldier take the flack which to him is water off a duck's back to all appearances.*

Quiet Rock moves forward, there are men about in this area of possibly six metres in width. The area is still in the shift bosses' words "`n vok op" now 48 hours later.

*It is now the turn of the Section Manager, a young engineer to address Quiet Rock (the miner responsible). "Are you f****** crazy?, he screams. "How can you let men work in an unsupported area? A man now carries back a temporary support extended on both ends, but the same as is used in the stope and removed before blasting.*

I don't catch it all, but within a few minutes, maybe five, certainly not ten, the white supervisors have gone. A temporary support base is being dug and work carries on.

There is no talk about blocked ore passes, stuck transport, only that Quiet Rock cannot have the eight trucks of packs that he wants, he says to me almost immediately.

The Soldier has been doing this for 40 years. Has he survived by luck, executing his job in this manner, seemingly way off the mine standard as it appears to a lay researcher? Or does he know how to mine after all? If he thought it dangerous, that ***he*** *might die would the area have been treated differently?*

Stabilising the cavern: Freedom Day 1.30pm Tuesday27 April 1999

> *The gully is finally taking shape. The packs hadn't been pumped up yet as the new blue and shiny pump did not work. Bashing it to release a presumed blockage did not help. There was no suitable equipment to fix it on the spot and this pump was to finally strengthen the packs in an area described as 'critical' 72 hours ago by Quiet Rock. The packs were tall and behind them reef was being drilled and a first set of blasting holes drilled to develop the stope.*
>
> *Following the energetic Quiet Rock around was, as ever, a job in itself. Desert Man commented on how quick he was around the place. I teased that I had got fit in the two days he hadn't been around in keeping up with this pleasant, quiet, highly informative man, who was, incidentally, pleased that I had seen the shift boss and Section Manager shout at him the previous Saturday.*
>
> *Later that evening* ***… the news of the two trapped miners has just flashed on TV behind me***[394]*. James Motlatsi cautions that as an earthquake is an earthquake, it cannot be said whether there was any problem with Health and Safety requirements being neglected or not …*

This being the situation in the 'cavern', any disquiet the shift-boss Jan may have experienced or expressed seeing I may have witnessed any infringement of mine regulations, was of little consequence at that point. Jan must have told the Section Manager that his tongue lashing of Quiet Rock had been observed as he mentioned it to me later. Given, however, that the miner from the stopes further up did not like the situation; that men huddled around the wall, silently, with eyes alert; that Jan kept peering at the roof-hanging; that he did not like the situation, the researcher had effectively become invisible given the fraught and tangible sense of danger. The problem of *reactivity* under conditions of ultra-deep mining, I suggest, can be overcome, the very situation in this instance encouraging conditions for eliminating any reaction men might have to the researcher. In this dangerous context, the analyst is simply another individual, every miner being intently focussed on the problem at hand.

[394] This was in fact the only occasion I spent time writing in the *induna's* room next door as our lights, ever weak, went out. Men huddled around the TV that evening watching the news of the Welkom disaster even more intently than usual.

Men on the mine had been informed researchers were present. Circulars had been sent by Section heads.[396] Meetings in the compound hall had announced researchers' presence. The team leader had introduced this researcher to the gang just beyond where a pile of packs was now being hurled up the pile of broken rock into the mouth of the 'cavern'. The researcher had been seen by most of the gang, either marking the roof-wall of hangings for roof-bolts, passing packs or barring down later on the upper South side of the gully prior to drilling the West face.[397] Given that under normal circumstances men refused point blank to permit anyone to interrupt them while engaged on a job, a researcher would not unduly occupy their minds.

The story of the 'cavern' cannot, however, be left without an ending.

Setbacks in the cavern and an accident: 7.50pm Wednesday 28 April 1999

> *A huge rock, visibly displacing itself from the hanging, a neat clean death waiting to happen, had not been brought down as instructed by the Shift Boss Jan the Monday before. Two men worked directly beneath it sorting out a slime-fill bag. I pointed out the danger and suggested they move either up or downstream from the threatening danger. They did.*
>
> *A few metres along the 'cavern', on Monday morning looking more like a regular workplace, was again in disarray with wet packs lying all over having been blasted away out of position from the Monday afternoon blast.*[398]
>
> *A fitter foreman went into some detail later about the possible reasons for the occurrence. Either the holes were not drilled at the correct angle or the support packs had not been properly installed.*
>
> *The shiny new blue pump was the cause of the problem. It can occur that it pumps up the bag, which is interlaced with the packs, with water instead of cement, permitting the blast to dislodge them. It is also possible that, given the problem with the pump, the cement did not have enough time to set or that the 'crib' - the wedges placed and knocked in at the top of the pack to secure it against the*

[396] It should perhaps be noted that this only occurred, however, after a manager had fallen out with a 'worker' who had happened to be a researcher who objected to the treatment received.

[397] The Soldier relished giving this *umlungu* work to do!

[398] There being no work on Freedom Day, the 'cavern' had remained unsupported again for a further 36 hours.

hanging had not been properly secured given the roughness of the hanging wall in the 'cavern'[399]*. In this instance, faulty equipment resulted in additional labour time not being spent directly on bonus-attracting measureable productive work.*

The men were consequently not in a happy mood, not being able to drill and so not achieve their blast for the day. If Quiet Rock was unhappy he did not show it.

The job for the day was consequently a relatively short one for the gang, despite some heavy lashing required in order to dig into the loose rock underfoot to find a solid basis for the packs. The high-pressure water hose still lay there from the night shift despite them not having done their job due to the area not being supported. It looked dangerous again.

….. it would become a beautiful panel, however, Quiet Rock assured me….

The only job being to replace the packs, the men worked like demons, their bare torsos glistening in the lamplight, running freely with fresh sweat. Each one was soaked.

I wondered how they all managed … the heat was particularly oppressive in the 'cavern' today … I suggested to Desert Man that we get some water, but he was told by Quiet Rock there was none today … He was right … there was no water all the way up the steps later… I had wondered about those steps … and whether transporting men up the winch controlled incline (would not save time and energy) … this used to taken place … until 40 men died when a carriage derailed … walking has been the routine ever since from 100 level down the thousand one hundred and fifteen steps to 105 …

Out Desert Man and I went,[400] *and to our surprise, The Soldier was to be found for the first time ever outside of the workings where his gang were maniacally busy.*[401] *The extractor fans were not working, resulting in no ventilation in the cross cut whatsoever…*

The Soldier challenged Desert Man (an NUM Safety Officer) to get some air into the 'cavern'. Desert Man attempted a very serious, official response by suggesting

[399] Despite the truth-claims in this paragraph, it remains a lay perspective. See footnote immediately above.

[400] Just for a break *sans* the hope of water! I did get a sip from a fitter's plastic two-litre coke bottle that had a huge lump of ice in it.

[401] Intent on observing the work, I had not noticed his absence. This is not unusual: the workings are extensive and men work very largely autonomously, certainly without looking over their backs as to whether supervisors are present.

the need to wait for the supervisors. The Soldier thought this very funny. Mining, he seemed to imply, entailed being able to attend to such matters, supervisors rarely being available when you needed them.

We went to look for water anyway, to no avail…

Quiet Rock had also exhausted himself a little earlier, so had also fled the 'cavern' … only those who simply had to be around and in the 'cavern' today stuck it out … the rest fled … giving me the first real taste of what every miner it seems knows … the mine is a place from which it is no disgrace to flee … the sentiment was tangible … signalled by men dashing off down the tracks … the heat was a most effective whip …

I wonder as I write whether it was that tangible sense of haste in the air, of trying to catch up time that was responsible for what was going to happen next.

The loco duly arrived around 1pm and there was a rush for the man-carriages, the first uncharacteristically being found full of men from further back down the line. Everyone made a dash and a couple of men got left behind, not without howls of protest, hesitation by the loco driver and the clatter of the gauze shutters of the carriage clashing up and down again increasing the crush inside. Knees were not quite so well arranged this trip.[402]

The loco moved off at a pace, quick I thought for its bumpy set of rails being attended to by D---- Construction, the independent contractor.

A little way down the tracks, there were howls from a carriage behind and the loco was brought to a stop. Men craned their necks in the darkness to try and work out what was going on, not being able to release themselves from the inside. It was all a bit uncertain.

The result of this unscheduled stop was a disconnecting of the last carriage and from the lamps of the men, who had disembarked and now followed the quite quickly moving loco on foot.

The loco now really sped up and I consciously recall thinking that this thing was going just too fast for a track under repair, any track for that matter.

[402] In the carriages eight men sit facing each other in two rows of four lacing their knees in a strict pattern to accommodate the tight fit for the fifteen minute ride back to the station.

At a bend in the tracks, a little way down from the 100 level station off the sub-shaft cross-cut which separates the shift going to TV shaft (sic)[403]*, things went suddenly awry.*

The whole loco came to an unceremonious and bumpy, jolted halt. It was surprisingly painless for a derail. 160 men roared as one… The carriage in front had its nose up against the one side of the tunnel, while the loco ended up skewed around with its nose in the opposite direction, its back wheels free of its rails embedded up to its box-like chassis and body in the gravel. No one was harmed.

But the young Shangaan loco driver was in for it. Jan the shift boss demanded his number and I asked him if this mess was for his account. He assured me it was not.

The infringement was a serious one and I wondered whether the well built, smooth featured young fellow was to receive a final warning or dismissal for his irresponsible and undue haste. He had not a single defender. Men milled around looking with interest at the mess before gunning off at a rapid rate to the queue at the station less than a kilometre away.

We hung around in the long queues, everyone apparently hasty today and leaving the mine as if their lives depended on it. We surfaced without incident, despite slime coloured water pouring all over the sub-shaft station, spitting at us all dressed in dry and more comfortable clothes.

[403] The colloquial name used for that particular tertiary shaft, the origin of which, like so much in mining, I do not yet know.