

**Compensation and Control:
Silicosis in the Ontario Hardrock Mining Industry, 1921-1975**

by

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A thesis submitted to the Department of History
in conformity with the requirements for
the degree of Master of Arts

Queen's University
Kingston, Ontario, Canada
September, 1997

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Thesis Abstract

Dieter Hogaboam, Compensation and Control: Silicosis in the Ontario Hardrock Mining Industry, 1921-1975.

Silicosis, a disease of the lungs, was once common in the gold and uranium mining communities of northern Ontario, notably Timmins, Kirkland Lake, and Elliot Lake. The history of silicosis in Ontario's hardrock mining industry serves as a case study of the evolution of worker's compensation for occupational disease. It also illustrates the attitudes of labour, management, and government towards the compensation and prevention of occupational illness. Over time, silicosis policies became linked to the struggle over workers' control of the labour process. The failure to eliminate the disease from Ontario's mines was a catalyst for the enactment of the province's first Occupational Health and Safety Act.

Abstract

Occupational health and safety is an understudied aspect of Canadian labour history. This study examines the response of labour, management, and government in Ontario to silicosis, a lung disease once common among hardrock miners. Silicosis was the first chronic lung disease covered by workers' compensation in Ontario and thus provides a useful example of attitudes to the compensation and control of occupational illness. From these issues a common theme of workplace control emerges. Governments, mining corporations, engineering and public health professionals, and miners all sought to have silicosis policies reflect their specific interests. Workers' compensation was damaging to the bottom line, but was a godsend to incapacitated mine workers. It also forced managers to take measures to reduce the incidence of silicosis.

At the same time, competitive pressures caused mining corporations to introduce a variety of technological and managerial innovations which reduced the ability of mine workers to control the work process. The desire of managers to improve productivity through greater control of the workplace forced workers to find new ways of influencing their working lives. One of the solutions was to assert their right to participate as equal partners in health and safety. Managers resisted this demand on the basis that it interfered with their ability to run the mines. Government aided the position of the corporations by advocating a laissez-faire approach to the regulation of working conditions in the mining industry. As a result, policies for the compensation and control of silicosis minimized the cost of the disease to companies by placing the burden of responsibility with the miners. As the strength of the labour movement increased in the latter half of the twentieth century, the lingering presence of silicosis was eventually publicized, pressuring the provincial government to shift its support behind labour. The result of this development was Ontario's first comprehensive occupational health and safety legislation.

Acknowledgments

I thank my thesis supervisor, Dr. Bryan Palmer, for his support and for his editing skills, which saved me from numerous embarrassments. I also extend thanks to various members of the Queen's Department of History who provided a stimulating environment in which to work. These friends willingly listened to my ruminations on silicosis, offering useful suggestions and posing questions I had overlooked. Of course, I remain responsible for any errors and oversights.

My deepest gratitude is reserved for my parents, who have provided limitless amounts of support and encouragement over the years. Without them, I would never have travelled this far from the nest successfully.

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Chapter One: Introduction to Silicosis as an Occupational Disease

“Have you seen the men, scores of them in every mining town, hobbling, haltingly on the streets, unable to walk many blocks without a stop to rest, to cough violently, and to draw in a new breath of air which seems to pass through their lungs with painful difficulty?”¹ This dramatic image was conjured up for the readership of Union News, a journal of the radical International Union of Mine, Mill, and Smelter Workers. However, it was not the vision of an apocalyptic writer. Rather, the description would have been immediately recognizable to the residents of northern Ontario mining towns. The men described were the victims of silicosis, an occupational disease that weakened the lungs of countless hardrock miners around the world, including those in Ontario.

Virtually forgotten today outside of mining communities, as recently as 1975 silicosis was grabbing headlines for its role in the deaths of close to 2 000 Ontario miners during the middle years of the twentieth century.² The emergence of silicosis ranks as one of the great industrial tragedies in Canadian history, yet it remains one of the least studied and publicized diseases of the lung. This is likely because it was strictly a working-class disease. The family and friends of doctors, scientists, policy-makers, journalists, and philanthropists did not contract silicosis as they did lung cancer or emphysema, diseases which could also result from the work environment. Silicotics lived in mining communities far away from the homes, offices, and laboratories of those with the power to publicize and combat silicosis. For the minority regularly involved with silicosis, how a person responded to the disease depended largely on one’s occupational status, and by extension, one’s class. Because of its isolation by class and geography, silicosis only attracted the political and public spotlight in times of crisis, as happened in the 1920s, the late 1950s, and the early 1970s. The rest of the time, silicosis lurked in the darkness of northern mines and smelters, the focus of an intense battle between capital and labour to control not just the disease, but the production processes that gave birth to this dust demon.

¹ International Union of Mine, Mill, and Smelter Workers, Sudbury and Timmins. “Real Facts about Silicosis in the Metal Mining Industry.” Union News 3 (November 1936): 8.

² For detailed statistics, refer to Appendix I.

It is the centrality of silicosis to the history of management-labour relations in mining that makes the examination of the disease particularly relevant to labour history. The responses of workers, managers, and policy-makers to the problems of silicosis can be used as a case study on the evolution of both workers' compensation for occupational disease and the struggle between capital and labour over workplace control, particularly as these applied to the mining industry. Silicosis was the first chronic industrial disease to be compensated by the Workmen's Compensation Board of Ontario. In the domain of compensation policy, the efforts of labour were concentrated on broadening the definition of compensable silicosis and on improving benefits. This was done in an effort to place the burden for compensation costs on the mining corporations. In contrast, the mining companies were concerned with minimizing their liability costs, a process which sought to shift the costs of industrial disease onto the victims. The government sought to be a neutral mediator of the competing interests of workers and operators, but its representatives tended to side with capital against the working class, except in instances where the demands and practices of mine operators shifted costs onto the public sector.

From 1921 to 1975, the issues of health and safety in general, and silicosis in particular, were used by labour, management, and the Ontario government to reinforce their respective positions over issues of workplace control. All three actors were interested in slaying the silicosis demon: miners because they did not wish to contract the disease, operators because they wanted to reduce their compensation costs, and government because it had a role to play in protecting its citizens and an interest in promoting industrial peace and economic development. The ensuing struggle to control silicosis became linked to the broader struggle over workplace control. Miners demanded a greater role in establishing and policing health and safety regulations to stave off the attack made on their autonomy by increased supervision and technological change. Silicosis became an important grievance of miners that inspired a sense of occupational solidarity, at first encouraging and later strengthening union organization. At the same time, labour wanted management to fulfill its self-proclaimed and legislated responsibility to provide a healthy working environment, instead of shifting the costs and inconveniences of the disease onto the workers. The silicosis prevention efforts of mine operators favoured low cost solutions that placed the onus for dust

control on the workforce. When dust levels remained high, managers were eager to blame human frailties for the situation. Worker negligence was then used to argue against giving labour a voice in health and safety regulation and enforcement. When efforts to reduce the incidence of silicosis were successful, operators trumpeted it as a victory for the laissez-faire approach to health and safety regulation. They maintained that management was fulfilling its responsibility for working conditions so well that progress would only be jeopardized by increasing the role of labour or the government in matters of health and safety. For their part, policy-makers accepted the arguments of capital and adopted a laissez-faire approach to health and safety issues, leaving the responsibility for silicosis prevention with management, and issues of workplace control to the collective bargaining process. Eventually, the failure to prevent silicosis, as evidenced by the rising number of compensation cases, led to the enactment of Ontario's first comprehensive safety and health act in 1978. This was a major working class victory that gained labour a mandatory role in shaping the production process via measures to protect the health and safety of the industrial workforce. The dust demon helped bring disrepute on the voluntary approach to health and safety, chasing it off the stage and hastening the curtain call for silicosis.

The compensation of occupational disease was not only a matter of fairness to sick workers and their families, it was also vital to efforts to reduce the incidence of occupational illness. The history of silicosis demonstrates that the voluntary approach to health and safety regulation was a failure from the beginning. Voluntarism made management responsible for the design, implementation, and enforcement of measures to protect the health of the mining industry's workforce. This responsibility was in direct opposition to management's responsibility to enhance shareholder value by maximizing profits through cost cutting and production increases. Managers were left to balance these conflicting responsibilities. Not surprisingly, profit maximization usually triumphed over health protection. Workers' compensation was the main reason that progress was made in the control of silicosis. This was because compensation assessments turned occupational disease into a cost of production that needed to be minimized. The most effective way to control compensation costs was to reduce the incidence of the compensable illness. Unfortunately, unscrupulous managers tried to reduce costs by severely limiting compensation benefits and who was eligible for these

benefits. This practice not only restricted the number of men receiving compensation, it also reduced the need to spend money on disease prevention measures. Labour's response was to push employers to deal with silicosis costs strictly through disease prevention measures, by demanding generous benefits for all silicotics and by demanding an equal role in efforts to prevent the disease. In this long-running class war, the government held the balance of power. Neither side could win a battle and hold its ground without government support. The ever changing winds of war ensured that the government remained a capricious ally.

The battle over silicosis in Ontario occurred within an industry tainted by a terrible history of industrial relations. In most industries, the relationships between management and labour were moderated by a significant number of grey areas in which neither side was clearly in the right or wrong. This was not the case in mining, an industry in which the capitalists and their managers personified evil. It was a rare instance when employees were treated as human beings rather than as cogs in the production process. Hours were long, wages were low, working conditions were dangerous and unpleasant, job security was non-existent, strikes were crushed by the coercive powers of the state, industrial legality was firmly resisted, and profits were usually enormous.

Mining was one of the last industry groups to take advantage of Workmen's Compensation Board funding to establish an accident prevention association.³ During the Depression of the 1930s, shift bosses sold jobs to desperate men.⁴ In the first ever session of collective bargaining at McIntyre Mines in 1944, the company's chief negotiator, Angus Campbell, refused to light the cigarette of a union member on the grounds that the only thing the union could expect "to get from McIntyre for nothing is absolutely nothing. And that includes matches."⁵ In a 1954 brief to the Special Committee Appointed by the Ontario Legislature to Inquire into the Socio-Economic Problems of the Gold Mining Industry in Ontario, the United Steelworkers revealed that in the Timmins gold mines, the work week was eight hours longer than the developing Ontario average and that personal incomes were the third lowest in Ontario, thirty percent below the level thought necessary for a family to

³ Ontario. Workmen's Compensation Board, Annual Report. 1921, 13.

⁴ Bob Miner, Miner's Life: Bob Miner and Union Organizing in Timmins, Kirkland Lake and Sudbury, ed Wayne Roberts (Hamilton, Ont.: Labour Studies Programme, McMaster University, 1979), 3-4.

⁵ Miner, Miner's Life, 13.

live comfortably. The brief accused the companies of subsidizing the mining of low grade ores and stock speculation with sub-standard working conditions and government aid.⁶ Union officials involved in a 1953 gold industry strike were blacklisted by the companies well into the late 1950s. As the rest of the industrialized world began to provide electric lights in mines during the 1960s and 1970s, Ontario miners continued to work in a darkness penetrated only by helmet lights.⁷ In 1975, mining employed 1.4 percent of the Canadian labour force, yet the industry was responsible for 57.5 percent of deaths related to occupational diseases.⁸ These examples illustrate the disregard and contempt with which workers were treated and convey a sense of the environment in which the history of silicosis was made.

As an occupational disease, silicosis can be classified as a health and safety issue. As one of the first compensable industrial diseases, it also serves as a case study in the operation of the Workmen's Compensation Board.⁹ Occupational health and safety forms an important component of modern labour legislation, union activity, and corporate human resources policy. Yet in Canada, little has been written on the history of health and safety in the workplace or the related subject of worker's compensation. One notable exception is the work of Eric Tucker. His study of occupational health and safety laws in turn of the century Ontario examines the evolution of factory legislation and worker's compensation from a market-based system of regulation to a system of state regulation. He concludes that laws regulating workplace health and safety were vague and weakly enforced, providing employers with little incentive to improve conditions. It was hoped that the mandatory liability costs of worker's compensation would provide the financial pressure necessary to inspire reforms. Perhaps most relevant to this study is Tucker's observation that new technologies and work processes were not inherently dangerous, but that much of the danger

⁶ Wayne Roberts, Preface to Miner's Life: Bob Miner and Union Organizing in Timmins, Kirkland Lake and Sudbury, by Bob Miner (Hamilton, Ont.: Labour Studies Programme, McMaster University, 1979), i.

⁷ Miner, Miner's Life, 16; Julian Hayashi, "\$40 million urged for mine research," London Free Press, 18 January 1975, AO F1352-2-0-13, OMA Papers, Royal Commission on the Health and Safety of Workers in Mines.

⁸ Wallace Clement, Hardrock Mining - Industrial Relations and Technological Changes at Inco (Toronto: McClelland and Stewart, 1981), 221.

⁹ During the period studied, the compensation board was known by its masculine appellation. For historical accuracy, Workmen's Compensation Board will be used throughout the paper.

resulted from management decisions to limit capital and operating costs at the expense of a safe and healthy work environment.¹⁰

If dangerous and unhealthy conditions were the product of management decisions, the same was true of improvements to the working environment, according to the economist Mark Aldrich. In his recent study of the Safety First movement which developed in the 1920s, Aldrich argues that the interest of employers in work safety was shaped by three public policy approaches to the problem: the regulatory approach, the voluntary approach, and the replacement of employers' liability law with workers' compensation. These external pressures forced managers to concentrate on improving work safety. It was only with management's interest in occupational safety that conditions began to improve. As management took control of the safety agenda, the role played by workers was diminished.¹¹

David Rosner and Gerald Markowitz argue persuasively that issues of occupational health and safety were issues of class. Their study of the Workers' Health Bureau of America, which functioned from 1921 to 1928, examines how a group of radical middle class women promoted health and safety as a class issue in response to the failure of governments and industry groups to take action towards improving working conditions. Rejecting the alleged neutrality of technical experts, the Bureau argued that scientific knowledge should be used to benefit workers. It was the American Federation of Labour which hurried the demise of the Bureau by urging locals to withdraw from membership in the Bureau. It is believed the AFL opposed the Bureau's radical conception of unions as a social and class movement, rather than simply as representatives of the members of a particular trade. The fact that many workers supported the efforts of the Health Bureau suggests that not all workers shared the AFL's conservative views.¹²

The argument presented by Rosner and Markowitz is rejected by the sociologist Julian Go III, who in an attempt "to transcend the explanatory limits of previous

¹⁰ Eric Tucker, Administering Danger in the Workplace: The Law and Politics of Occupational Health and Safety Regulation in Ontario, 1850-1914 (Toronto: University of Toronto Press, 1990). For example, see pages 4, 19, 193ff., 207.

¹¹ Mark Aldrich, Safety First - Technology, Labor, and Business in the Building of American Work Safety, 1870-1939 (Baltimore: John Hopkins University Press, 1997), 2-7.

¹² David Rosner and Gerald Markowitz, "Safety and Health on the Job as a Class Issue: The Workers' Health Bureau of America in the 1920s." Science and Society XLVIII (Winter 1984-85) 466-82.

approaches," argues that the American struggle for workers' compensation cannot be treated as an issue of class because the various sides changed their positions in different socio-economic environments and formed cross-class alliances. Instead, Go argues that social problems were discursively constructed or framed in the course of everyday experience and interaction. He then goes on to show how different socio-economic groups arrived at the same position for different reasons. It is unclear from his article why class positions cannot change with circumstances, based on what is most advantageous to a particular class at a particular point in time. Nor is it clear why the formation of cross-class alliances cannot be made if the groups in question find it advantageous to the advancement of their particular class interests. Go continuously describes class positions to demonstrate that such an explanatory approach to the history of health and safety is inadequate, rendering his position somewhat contradictory.¹³

First described by Pliny, silicosis may be an ancient disease, but the historiography of the condition is not. The history of silicosis in Canada has not yet been written. The situation is better in the United States, where several historians have recently studied silicosis. In two very similar articles, James Foster finds evidence that silicosis was a major health concern for western hardrock miners and a factor in the propensity to strike. He also provides examples of corporate resistance to safer mining practices and worker's compensation legislation.¹⁴ In his book on the grassroots health care efforts of the Western Federation of Miners, Alan Derickson points out that silicosis killed more miners between 1890 and 1920 than all mine accidents combined. For this reason, silicosis was an important factor in the union's efforts to both help sick miners and improve health conditions in the mines.¹⁵ The prolific team of David Rosner and Gerald Markowitz argues that the discovery and definition of silicosis was as much a social process as a scientific one. Silicosis emerged as an important issue for labour in the 1930s, when unemployed workers sought

¹³ Julian Go III, "Inventing Industrial Accidents and Their Insurance - Discourse and Workers' Compensation in the United States, 1880s-1910s," Social Science History 20 (Fall 1996): 401-38. It is unclear why industrial accidents had to be invented when they were a daily reality of the workplace.

¹⁴ James C. Foster, "Western Miners and Silicosis: The Scourge of the Underground Toiler, 1890-1943," Industrial and Labour Relations Review 37 (1984): 371-85; James C. Foster, "The Western Dilemma: Miners, Silicosis, and Compensation," Labor History 26 (1985): 268-87.

¹⁵ Alan Derickson, Workers' Health, Workers' Democracy - The Western Miners' Struggle, 1891-1925 (Ithaca: Cornell University Press, 1988), 39, 157.

compensation as an economic strategy in the absence of social welfare. Worker's compensation came to be seen as a reliable alternative to the determination of compensation entitlement by the court system. Rising compensation settlements led management and the insurance industry to look to compensation as a means of controlling liability costs.¹⁶

Silicosis first reached epidemic proportions in South Africa. Elaine Katz examines the development and response to silicosis in Witwatersrand from 1886-1910. Katz reports that dust elimination measures were first proposed in 1902, but little had been done by 1910, as the Chamber of Mines continued to deny that silicosis was a problem. A new era began in 1911, when the disease became compensable. Katz contends that the increased dust generated by mechanized drills was not the cause of silicosis, rather the true causes were the labour processes of mass production and the working conditions tolerated by managers and mine owners. These conditions were endured because of the dominance of the mine owners over the life and politics of the Rand. In addition, powerful people and institutions remained indifferent to a disease confined to the working class. The menace of silicosis and the insecurity it caused fuelled miner radicalism.¹⁷

Beginning in the 1970s, studies began to appear on the history of workplace control. These studies were closely connected with the efforts of some historians to expand the boundaries of labour history from their institutional focus on unions and industrial legality to encompass the whole range of working-class life, including the ways in which working life combined with relationships and activities beyond the workplace to form a distinctive working-class culture. In general, historians of workplace control agree that in the late nineteenth and early twentieth centuries, economic pressures compelled capitalists and managers to reduce their dependency upon the skills and knowledge of the workforce. Managers sought to increase the discipline and productivity of their employees by asserting their own right to control workplace activities. They attempted to accomplish this, with

¹⁶ David Rosner and Gerald Markowitz, Deadly Dust - Silicosis and the Politics of Occupational Disease in Twentieth-Century America (Princeton: Princeton University Press, 1991), 9-10. Rosner and Markowitz do the best job of bringing together the elements of medical history and labour history evident in the study of silicosis.

¹⁷ Elaine Katz, The White Death - Silicosis on the Witwatersrand Gold Mines (Johannesburg: Witwatersrand University Press, 1994), 4-10. The similarities between the history of silicosis in the United States, South Africa, and Canada are overwhelming and suggest that the dictates of capitalism are far more powerful than any national characteristics.

mixed success, through scientific management, which increased the mechanization of the workplace and divided the skills of craftsmen into many smaller, specialized steps that managers could train novices to perform quickly. Even where skill levels remained relatively intact, the increased use of machines allowed managers to dictate the pace of production instead of the workers. However, workers did not acquiesce to the new factory environment without offering resistance. Tradespeople had long based work practices upon the customs of their particular craft. As deskilling made it more difficult to enforce traditional practices by simply withholding one's labour, a variety of new strategies were developed by workers, skilled and unskilled, seeking to assert their right to determine working conditions. These included the formation of unions, through which wage earners sought to negotiate such basics as wages, work rules, and hours of work. When these efforts met with limited success, many workers looked beyond the workplace to the reform of society advocated by socialists and other radical reformers. Unfortunately, economic hardship, new personnel management techniques designed to weaken unions and class solidarity, and state support for capital ensured that labours' efforts to resist subordination were usually unsuccessful. However, a legacy of conflict was also created by these struggles over control of the workplace.¹⁸

A few studies on workers' control specific to the Canadian mining industry have been undertaken. As it took longer for mechanization and scientific management to penetrate the mining industry than in other industries, miners did not have to cope with management's encroachment on traditional practices until the 1920s. In a study of Cape Breton coal miners in the 1920s, David Frank documents the power over working conditions exercised by the miners on account of their much needed skills and the strong sense of solidarity they derived from a combination of pride in their trade and the harsh conditions underground. Their skills and solidarity played an important role in labour-management

¹⁸ The situation in the United States is examined in detail by David Montgomery in Workers' Control in America - Studies in the History of Work, Technology, and Labor Struggles (Cambridge: Cambridge University Press, 1979) and in his impressive The Fall of the House of Labor - The Workplace, the State, and American Labor Activism, 1865-1925 (Cambridge: Cambridge University Press, 1987). My criticism of Montgomery is that he seems to place too much emphasis on methods of scientific management at the expense of new production technologies introduced on account of this ideology. Managers had long been ignored, but machines driving the pace of production could not be resisted as easily. The best studies of the struggle for workers' control in Canada remain Bryan D. Palmer, A Culture in Conflict - Skilled Workers and Industrial Capitalism in Hamilton, Ontario, 1860-1914 (Montreal: McGill-Queen's University Press, 1979) and Gregory S. Kealey, Toronto Workers Respond to Industrial Capitalism, 1867-1892 (Toronto: University of Toronto Press, 1980).

conflicts of the time, enabling miners to take radical actions and to propose radical solutions in resistance to management efforts to reduce their traditional autonomy. Frank argues that the quest for formal control over the workplace manifested itself most persistently in concern over health and safety.¹⁹

In a thorough study of changing work processes in the 1960s and 1970s at Inco, the giant nickel and copper mining company, Wallace Clement documents how management used technology to weaken the power of a well-paid and radical workforce that traditionally exercised considerable autonomy over the labour process. Mechanization fragmented the labour process, thus reducing the skills required by miners to perform their increasingly specialized jobs. Workers easier to train were also easier to replace. In addition, management was able to shrink the size of the workforce considerably, decreasing labour costs per unit of output. Mechanization also made it easier to monitor the productivity of individual workers, which was a shift from earlier times in which supervision was minimal despite harsh discipline. However, the bonus system continued as a method of maximizing each worker's output. The bonus system and mechanization were blamed for causing the majority of workplace accidents, yet any attempt by labour to gain a voice in the determination of a safe work environment was resisted as an infringement of management rights. Clement demonstrates that issues of health and safety were hijacked by the politics of industrial relations, as the union used health and safety disputes to implement slow downs and management used protective rules to extend its social control over workers.²⁰

Silicosis, a form of pneumoconiosis, is a fatal lung disease common in hardrock miners, foundry workers, metal polishers and grinders, and stone cutters caused by the inhalation of silica dust particles from minerals such as quartz, flint, and chalcedony. These substances occur among other minerals such as gold, silver, copper, lead, and zinc. Only dust particles between 0.5 microns and 5 microns in size can lead to silicosis. Smaller particles are filtered out by the body, while larger particles have difficulty passing through the mucus membrane. The disease was an occupational hazard among miners with a history

¹⁹ David Frank, "Contested Terrain: Workers' Control in the Cape Breton Coal Mines in the 1920s," in On the Job: Confronting the Labour Process in Canada, eds. Craig Heron and Robert Storey (Kingston and Montreal: McGill-Queen's University Press, 1986), 102-23.

²⁰ Clement, Hardrock Mining, especially 83, 156-62, 221, 231-50.

reaching back centuries, but in the twentieth century the occurrence of silicosis was exacerbated by technological change.²¹ With the advent of mechanization, silicosis presented a serious threat to the health of the underground workforce.

Medical researchers have divided silicosis into three stages. During the first stage, small particles of silica are retained in the bronchial tree. Phagocytes engulf the particles and move them into the channels of the lymphatic system, where a reaction causes them to poison the immediate area of the system. This leads to a thickening of the channel and its associated arteries as defensive scar tissue grows. The damage has little immediate effect on the functioning of the lung and is not noticeable in ordinary x-rays. After the lymph channels have been blocked and new silica particles can no longer be removed from the lung, the disease moves into a second stage. The new particles clump together in the lung and irritate it, causing a dry cough. In addition, shortness of breath becomes a problem. The third and final stage of silicosis is characterized by a deterioration in the functioning of the lung and severe difficulties in breathing. As weakened lungs become susceptible to other diseases, the deterioration process proceeds and accelerates. Death could come within ten years of the initial exposure to silica dust or the disease could hide its presence for over twenty years. Many miners with silicosis died from emphysema, bronchitis, or pneumonia, but most succumbed to a form of tuberculosis known as silico-tuberculosis. Tuberculosis was a common complication of silicosis that could occur at any stage of the disease. Those with political influence long denied that silicosis was responsible for tuberculosis, as tuberculosis could be acquired by non-silicotics as well. Since silicosis frequently became disabling with the onset of tuberculosis, the blurred links between the two conditions were used to deny workers' compensation to silicotics.²²

The lung diseases of miners have been linked to dust since at least the first century AD, when they were described by Pliny. However, it was not until the 1860s that the difference was understood between tuberculosis, lung diseases caused by the inhalation of dust, and silicosis. It was the German scientist Friedrich Albert von Zenker who first used

²¹ Foster, "The Western Dilemma," 273-4.

²² Foster, "The Western Dilemma," 273-4; Francis H Y. Green and Val Vallyathan, "Biological Responses to Inhaled Silica," in Silica and Silica-Induced Lung Diseases, eds. Vincent Castro-Alamancos, Val Vallyathan, and William E. Wallace (Boca Raton: CRC Press, 1996), 51.

the term pneumoconiosis to stress that there were a variety of lung diseases caused by dust inhalation. In 1870, the lung disease caused by the inhalation of free silica was labelled as silicosis.²³

The incidence of silicosis increased rapidly after 1890 as a result of technological changes which occurred as part of the Second Industrial Revolution. Power hydraulic drills replaced hand tools. These drills not only produced more dust than hand drills, but they produced smaller dust particles of the size which entered and remained in the lungs. The finer dust also took longer to settle. In addition, dynamite replaced black powder for blasting. The dynamite propelled dust particles farther, so each miner was breathing not only his dust, but the dust created by other miners. These procedures sped up the process of extracting minerals from the rock, but corresponding advancements were not made in how the minerals were moved. To keep pace with the extraction process, shovellers had to work faster than they had before. While shovellers had previously moved between 32 000 and 38 000 pounds of rock per day, they began to move a phenomenal 75 000 to 100 000 pounds each day.²⁴ The increased activity stirred up more dust than before and increased respiration rates (and the number of particles inhaled), so shovellers were also affected. Other practices also increased dust levels: miners frequently cleared clogged drill holes by blasting them out with small dynamite charges or by blowing them clear with compressed air.²⁵

The rise in the number of silicotics led to new studies on the causes and prevention of the affliction. A ground-breaking study was released in England in 1910. Written by J.S. Haldane and R.A. Thompson, it isolated silica dust as the cause of most mining disease among Cornish miners. The study was reported and praised in mining journals throughout the English-speaking world, while public health officials began to call for dust reduction measures in mines.²⁶ This indicates that mechanical drilling was introduced into the

²³ Foster, "The Western Dilemma," 268-9.

²⁴ Gerald Markowitz and David Rosner, "'The Street of Walking Death': Silicosis, Health, and Labor in the Tri-State Region, 1900-1950," *Journal of American History* 77:2 (1990): 529.

²⁵ Alan Derickson, "Federal Intervention in the Joplin Silicosis Epidemic, 1911-1916," *Bulletin of the History of Medicine* 62 (1988): 239-40. Although the above changes in the work process are taken from American sources, it can be assumed that similar changes were underway in Ontario, although the timing may have been delayed. Similarities between Ontario and the United States can be found throughout this paper.

²⁶ Foster, "The Western Dilemma," 274. Chapter Two and the Appendix of Katz, *The White Death* also offer an excellent discussion of the medical aspects of silicosis.

hardrock mines of Ontario around the same time that the cause of silicosis was discovered and that awareness was increased about how to reduce the incidence of the disease. There is no evidence, however, that dust control measures were introduced in Ontario prior to the 1920s.

Silicosis was long affiliated with tuberculosis. In recent years, evidence has emerged to link silica dust to elevated levels of lung cancer among workers exposed to the dust. However, because of the various substances industrial workers were exposed to, researchers had difficulty separating the effects of silica and silicosis from the confounding influences of known carcinogens such as radon daughter products and tobacco. Despite this difficulty, further studies concluded that lung cancer risk was increased in workers exposed to silica, and not just those also exposed to known carcinogens. It was also noted that the increased lung cancer risk among dust workers was concentrated in those who actually developed silicosis. Silicosis was an unusual condition in that the probable carcinogen (silica) acted mainly on people suffering from another respiratory disease caused by the same agent. A study of Ontario workers granted compensation for silicosis between 1925 and 1975 found that throughout the time period, these men experienced a decreased life expectancy and those receiving compensation awards prior to 1960 also had lung cancer mortality rates higher than the general population. However, the influence of smoking on the lung cancer rate of silicotics was unknown. The study concluded that because lung cancer mortality rates were elevated among full-time underground gold miners, mixed-ore miners, and uranium miners, it was possible that some factor associated with environmental conditions underground may have been related to some of the lung cancers.²⁷

The links between workplace control and occupational disease are well presented in a traditional mining song popularized by the musical group *Cowboy Junkies*:

²⁷ Joseph Fraumeni, forward to *Silica, Silicosis, and Cancer - Controversy in Occupational Medicine*, eds. David F. Goldsmith, Deborah M. Winn, and Carl M. Shy (New York: Praeger, 1986), i; L. Simonato and R. Saracci, "Epidemiological Aspects of the Relationship Between Exposure to Silica Dust and Lung Cancer," in *Occupational Exposure to Silica and Cancer Risk*, eds. L. Simonato et al. (Lyon: International Agency for Research on Cancer, 1990), 4; M.M. Finkelstein et al., "Follow-up of Miners and Silicotics in Ontario," in *Silica, Silicosis, and Cancer - Controversy in Occupational Medicine*, eds. David F. Goldsmith, Deborah M. Winn, and Carl M. Shy (New York: Praeger, 1986), 322-5.

...

On the line boys; on the line boys,
Drill your holes and stand in line,
'Till the shift boss comes to tell you,
You must drill her out on time.

Can't you feel the rock dust in your lungs,
It'll cut down a miner when he is still young.
Two years and the silicosis takes hold,
And I feel like I'm dying from mining for gold,
Yes, I feel like I'm dying from mining for gold.²⁸

²⁸ Cowboy Junkies. "Mining for Gold," from The Trinity Session, arranged by James Gordon, BMG Music Canada, 1988.

Chapter Two: Silicosis in Ontario to 1939

The debates surrounding silicosis in Canada prior to the Second World War were significantly different from those in the United States. The historiography indicates that in the United States, silicosis was linked to the struggle for compensation of industrial diseases. In Canada, particularly in Ontario, where silicosis was compensable before it became a serious problem, the debate revolved around the evolution and implementation of measures for the control of silicosis and the compensation of silicotics. However, in both countries, employers were reluctant to accept the consequences of silicosis as a cost of production. They preferred to see it as an occupational risk accepted by the employee.

If the effort to deal with silicosis in Ontario hardrock mines between 1921 and 1939 was a matter of life and death, it was also an issue of workplace control. The responses of management, of officials from the Department of Mines, the Department of Health, and the Workmen's Compensation Board, and of miners were shaped by distinct occupational statuses. Each group attempted to shape silicosis policy to suit its class-based agenda. This caused the development and implementation of silicosis policy to be a top-down process that placed a disproportionate share of the costs and inconveniences on miners, mainly because of the refusal by mining companies to accept silicosis as a cost of production. For this reason, the miners opposed much of the legislation as they struggled to involve themselves in the policy-making process and to pass the costs of silicosis back to the corporations. These processes were evident in the evolution of worker's compensation policy and in efforts to prevent silicosis.

Compensating Silicosis

In 1911, light hammer drills known as "widow-makers" came into widespread use in the hardrock mines of Ontario. "Widow-makers" contaminated the air with fine dust particles, and as the label suggests, this dust caused fatal lung diseases in miners.¹ From this

¹ Doug Baldwin, "A Study in Social Control. The Life of the Silver Miner in Northern Ontario." *Labour / Le Travailleur* 2 (1977): 92.

time forward, silicosis presented a threat to the health of the underground workforce. This date coincided closely with the widely discussed Haldane report, released in 1910. However, the absence of dust control measures in Ontario prior to the 1920s suggests that the warnings of the scientific community were not heeded by those responsible for the province's rapidly expanding mineral industry.

While preventive measures were slow in coming to Ontario, the introduction of compensation for miners' lung diseases was not. In 1914, an act of the provincial legislature created the Workmen's Compensation Board of Ontario. With this act, Ontario became one of the first jurisdictions in North America to replace employer's liability law with a bureaucratic system of compensating injured workers or the families of workers killed on the job.² The initial legislation only covered injury or death, not occupational disease. Three years later, several industrial diseases were granted compensable status, including miners' phthisis, a generic term for the various lung diseases of miners where tuberculosis was present. Miners' phthisis was the only one of the compensable industrial diseases that was chronic in nature, as disability from lead and arsenic poisoning was temporary - when not fatal.³ This study shows that silicosis was arguably the most controversial occupational disease for many years. This status likely derived from the greater cost of long-term disability payments granted to silicotics.

Little is known about the decision to include industrial diseases in the Workmen's Compensation Act because the archival records of the Ontario Department of Mines and Department of Labour are sparse prior to the 1920s. It is known that the first case of miners' phthisis was not compensated until 1924.⁴ From this it can be assumed that the inclusion of miners' lung diseases did not reflect an emerging crisis. Instead, the legislation might be

² For a discussion of employer's liability law and the market regulation of compensation for injured workers, see Chapter 3 in Eric Tucker, Administering Danger in the Workplace: The Law and Politics of Occupational Health and Safety Regulation in Ontario, 1850-1914 (Toronto: University of Toronto Press, 1990). The American system, which was very similar to the Canadian one, is reviewed in Marc Aldrich, Safety First - Technology, Labor, and Business in the Building of American Work Safety, 1870-1939 (Baltimore: John Hopkins University Press, 1997), 31.

³ Ontario. Workmen's Compensation Board, Annual Report, 1916, 28.

⁴ J.G. Cunningham, "Silicosis in Canada." Silicosis, Records of the International Conference Held at Johannesburg, South Africa, August 13-27, 1930. International Labor Office, 317. After completing my research, I became aware that the WCB was originally the responsibility of the Attorney-General, so some early records may be in the files of the Attorney-General's Office preserved at the Archives of Ontario.

classified as proactive. Perhaps the publicity silicosis was beginning to receive in mining and public health journals created concern in Ontario that similar problems might soon emerge in the province's young mining industry. However, this would seem to be contradicted by the fact that as early as 1911, hydraulic drills were labelled as "widow-makers."⁵

If miners seemed to believe that dust was killing their co-workers prior to the 1920s, they did not turn to the government or the mining companies for assistance. Influenced by the self-help and mutual aid principles of the Western Federation of Miners, the union locals of northern Ontario cared for their ailing members with financial and emotional support to members unable to work. The ideology of self-help formed part of a strategy to counter the growing power of the mine operators, as mechanization and wage labour reduced the traditional independence of the workforce.⁶

In 1921, Dr. J.H. Elliot reported that silicosis was present among the miners of Ontario. Elliot's conclusion was based on the results of a study conducted on underground workers in the Porcupine operations of Hollinger Consolidated Gold Mines. The study examined eleven men who had each worked in the Porcupine mines for over seven years and who had no other exposure to silica dust. Three of these men were found to have evidence of silicosis, indicating that the disease was present in Ontario. By 1930, one of the men identified had died from third-stage silicosis, complicated with tuberculosis. The other two had advanced from the first to the second stage of the disease.⁷ This suggests that the advancement of silicosis was much slower in Ontario than in South Africa and parts of the United States. The slower pace is likely explained by a lower silica content in the rocks of Ontario mines. It also explains in part why silicosis appeared in Ontario much later than in other mining jurisdictions.⁸

⁵ Baldwin, 92.

⁶ Alan Derickson, Workers' Health, Workers' Democracy - The Western Miners' Struggle, 1891-1925 (Ithaca: Cornell University Press, 1988), 1-2.

⁷ Cunningham, "Silicosis in Canada," 318. Elliot's results were reported in the October 1924 issue of the Canadian Medical Association Journal.

⁸ Memorandum on the report of Dr. J. Michael Smith, 1927, Archives of Ontario (AO) RG13-21-0-45, Ontario Department of Mines, Mines Inspection Branch, Silicosis File (hereafter referred to simply as the Silicosis File). The quartz content in the mines at Sudbury and Cobalt was estimated to be around 10 percent, while the content at Porcupine and Kirkland Lake was estimated to be around 50 percent. This contrasts with a quartz content of up to 95 percent in some South African gold mines.

The 1921 findings begat a flurry of activity to determine how widespread silicosis was in Ontario. It appears that the initiative to study silicosis came from officials in the Division of Industrial Hygiene. In a memorandum dated 19 January 1926, J. Cunningham, the director of the Division of Industrial Hygiene, recommended permission be granted to extend the Porcupine silicosis survey, undertaken in 1925, to other mining areas in northern Ontario.⁹ It is not clear if the mine operators played a role in initiating the studies, but they deserve credit for cooperating. Mine managers arranged for the examinations to be conducted on company time and provided office space to the Department of Health's investigators.¹⁰ Corporate cooperation with government officials became common as the two parties tried to cope with the issue. Corporate goodwill gained mine officials an important role in shaping silicosis policy. To maintain the spirit of cooperation, government officials rarely moved beyond moral suasion to enforce the inadequate legislation that the corporations allowed the government of Ontario to enact. A similar pattern of cooperation and moral suasion developed in the United States.¹¹

Cunningham's request to expand his division's activities was granted and, in 1926, silicosis surveys were conducted in the four main mining areas of the province: Porcupine, Kirkland Lake, Cobalt, and Sudbury. The studies were conducted by employees from the Division of Industrial Hygiene and the Tuberculosis Division of the provincial Department of Health. The surveys examined miners with more than five years underground experience in the specific district who had not been exposed to silica dust in any other mining area, although a few who had worked elsewhere were also included. The results of the survey are reported in Table 1. They indicated that silicosis was or could someday become a serious problem in the gold mining camps of Porcupine and Kirkland Lake. The silver mines of Cobalt and the nickel mines of Sudbury showed evidence of silicosis, but not to the same extent as the other two areas. In 1926, mines had been operating for 31 years in Sudbury, 22 years in Cobalt, 14 years in Porcupine, and 8 years in Kirkland Lake. In Porcupine, the

⁹ Memorandum from J. Cunningham, Director, Division of Industrial Hygiene to Dr. Bell, Deputy Minister of Health, 19 January 1926, AO RG13-21-0-42, Silicosis File.

¹⁰ Ibid.

¹¹ Alan Derickson, "Federal Intervention in the Joplin Silicosis Epidemic, 1911-1916," *Bulletin of the History of Medicine* 62 (1988): 241.

average length of exposure ranged from nine to ten years.¹² It was expected that as the Ontario mining industry aged, the number of men with silicosis would increase as they accumulated silica dust in their lungs.¹³ The few cases of silicosis present in Sudbury and Cobalt were seen to be caused by individual susceptibility to even a small amount of silica dust.¹⁴ This view of individual susceptibility would frequently reappear in future legislative attempts to limit the eligibility for employment in Ontario mines.

Table 1 - Silicosis Survey Results from 1925 and 1926

Mining area	# of subjects	Stage of silicosis*	# of cases with silicosis	Avg. years of exposure in area	Avg. years of exposure elsewhere in Ontario	Avg. years of exposure outside of Ontario
Porcupine	236	anteprimary	29	9	1	1
		primary	9	9	0	0
		secondary	8	10	3	4
Kirkland Lake	280	anteprimary	11	3	5	5
		primary	2	n/a	unknown	n/a
		secondary	2	n/a	n/a	unknown
Cobalt	398	anteprimary	6	11	2	6
		secondary	1	12	0	0
Sudbury	306	anteprimary	6	7	2	2

Source: J.G. Cunningham, "Silicosis in Canada," 319.

*The secondary stage is the most serious and the ante-primary stage is the least serious.

One aspect of the silicosis controversy not clearly answered by the available historical sources is who proposed placing the disease under the jurisdiction of the Workmen's Compensation Board. In the 1950s and 1960s, mine operators claimed credit for this working-class victory. While this boast can neither be proved or disproved, contemporary sources suggest that the industry came to over-estimate its leadership, confusing consent with initiative. In none of the sources examined are the mining companies credited with obtaining workers' compensation for silicosis. It was at a meeting on 5 February 1926 that Ontario's minister of mines, Charles McCrea, informed industry

¹² Cunningham, "Silicosis in Canada," 319-20.

¹³ J. Cunningham to Dr. Bell, 19 January 1926, AO RG13-21-0-42, Silicosis File.

¹⁴ Cunningham, "Silicosis in Canada," 321.

representatives that the government intended to draft a compensation law for silicosis. Only at this point was input from the mine operators requested.¹⁵ In a speech to the Timmins branch of the Kiwanis club in July 1926, the silicosis expert Dr. Haig discussed the removal of silicotic workers from mines as a means of arresting the development of silicosis and noted this was the aim of the Workmen's Compensation Board in developing a compensation policy. Dr. Haig also praised the Department of Health for its interest in studying the disease. Finally, the mine owners and managers were commended by the doctor for their cooperation - not their leadership.¹⁶ It is more likely that the industry, upon realizing that silicosis was a problem, decided its best interests lay in cooperating with the government. Uncompensated, silicosis could have posed a future liability problem as sick workers sued their former employers. In addition, any attempt by the firms to ignore the problem would have given the Mine Workers' Union of Canada ammunition in its stalled organizing drive. There would also have been the risk that any negative publicity for corporate inaction could have forced the government to act against corporate interests. It was probably deemed better to participate in the design of a provincial silicosis policy than to resist it. Not surprisingly, the government gave the mining companies considerable input into the policy-making process. Finally, there was undoubtedly some desire to ease the suffering of affected employees, who in a small mining town would have been more than just anonymous workers.

It is possible that the campaign to define silicosis as an industrial disease eligible for worker's compensation was initiated by the Division of Industrial Hygiene. This theory is based not only on the Division's leadership in conducting the silicosis surveys, but on the ideology expressed by the Division in the annual report of the provincial Department of Health. As early as 1923, the Division was advocating a business friendly approach to the compensation of industrial diseases:

...where industrial diseases are compensated industrial executives are, as a rule, more than willing to assist in determining an adequate means of prevention...It is not enough that he be penalized for a high incidence: he

¹⁵ Memorandum of a conference held at the office of the Minister of Mines, 5 February 1926, AO RG13-21-0-30, Silicosis File.

¹⁶ "Earnest Work in Combatting the Spread of Silicosis," *Porcupine Advance*, 15 July 1926. 9.

should receive a proportionate financial advantage over his competitor if the incidence of occupational disease in his plant is lower.¹⁷

In addition, the reports placed a great deal of emphasis on using education to gain the cooperation of employers and employees in improving the health of the workplace: "The objective of the Division of Industrial Hygiene is to help industry to help itself in reducing the suffering and loss in production caused by ill health, physical defects, and industrial accidents - one of the four great sources of waste in industry."¹⁸

The language of the reports emphasizes a neutral and reformist role for industrial hygienists in an age of ascendant industrial capitalism. Given this view of their occupational role, the promotion of silicosis compensation by the Division of Industrial Hygiene could have been a realistic possibility, as compensation would protect the workers, encourage better working conditions, and reward progressive mine operators with a competitive advantage in the form of lower compensation costs. It is also notable that industrial hygiene had only recently emerged as a separate discipline. The members of this new profession would have been eager to establish their usefulness and to find a niche for themselves in the scientific study of the workplace. The silicosis surveys and the promotion of workmen's compensation for industrial diseases would have served the aims of this young profession.¹⁹

The leadership of the public health profession, not the mining industry, in the campaign for silicosis legislation was recognized in a 1932 document prepared by the Ontario Mining Association, which admitted that "[t]his legislation was introduced as a result of information furnished the Government and the Mining Industry by the Board of Public Health... There being no reason then to question the conclusions drawn, the operators cooperated fully and freely with the government in the steps... to provide compensation to the men affected."²⁰

¹⁷ Ontario. Department of Health, Annual Report, 1923, 41.

¹⁸ Ontario. Department of Health, Annual Report, 1921, 35; Annual Report, 1925, 24.

¹⁹ This speculation on the attempts of industrial hygienists to create an identity and role for themselves is based on a study by Christopher Sellers of a similar process in the United States: "The Public Health Service's Office of Industrial Hygiene and the Transformation of Industrial Medicine," Bulletin of the History of Medicine 65 (1991): 42-73. Further similarities between industrial hygienists in Ontario and the United States can be gleaned from David Rosner and Gerald Markowitz, "Research or Advocacy: Federal Occupational Safety and Health Policies During the New Deal," Journal of Social History 38 (1985): 365-81.

²⁰ Ontario Mining Association (OMA), "Silicosis in Ontario," 1932, 1, AO RG13-13-0-46, Department of Mines, Central Registry Files.

In 1925, T.F. Sutherland, the Chief Inspector of Mines for Ontario, visited South Africa, where silicosis had long been considered the most serious problem faced by the industry and where research and legislation were therefore the most advanced. This was one of many instances where Ontario would look to South Africa for guidance.²¹

Early in 1926, plans were being formulated to cope with silicosis in the mines of northern Ontario. On February 5, a meeting was held in the office of the Ontario minister of mines, Charles McCrea. In addition to the minister, his deputy minister, T.W. Gibson, and the chief inspector of mines, T.F. Sutherland, were also present. Representing the Department of Health were the deputy minister and the chief of the Industrial Hygiene Division. The mine operators were represented by officials from McIntyre Mines, Dome Mines, and Hollinger Mines, including N.H. Timmins, the president of Hollinger and J.P. Bickell, the president of McIntyre. The minister of mines informed the meeting of the government's intention to introduce legislation for the compensation of silicosis. He stated that the aim of the government was to protect the health of the workmen, to cooperate with the mining industry in its expansion and development, and to develop a means of dealing with silicosis that was in the interest of all parties. In return, the mining executives expressed their "willingness and desire" to cooperate with the government.²² The language and tone of this meeting reflected the shared interests of the mine operators and the government regulators, whose common end was to promote the expansion and profitability of the mining industry, while showing a modicum of decency towards the men who did the actual work. A cynic might be excused speculation on the self-interest involved in keeping the labour force alive, and in using compensation to attract workers to the dangerous mines.

The theme of protecting corporate interests was developed more fully in a subsequent meeting between Sutherland and Dr. W.J. Bell, the deputy minister of health. It was agreed to implement a system of regular medical examination to identify cases of silicosis and to remove those requiring treatment from mine employment. X-ray exams were also proposed for those seeking employment in the mining industry to ensure that only those free of

²¹ "History of Silicosis Legislation in Ontario," memorandum prepared for W.A. Gordon, Federal Minister of Labour by Ontario Department of Mines, 1933, AO RG13-21-0-27, Silicosis File.

²² Memorandum of a conference held at the office of the Minister of Mines, 5 February 1926, AO RG13-21-0-30, Silicosis File.

diseases would be given employment, a recognition of the link between tuberculosis and silicosis.²³ These ideas came directly from South African practices and placed the emphasis of silicosis prevention on personal characteristics rather than on working conditions underground. The notion that a suitable workplace should not cause disability or aggravate minor health problems was foreign to the government regulators and corporate officials formulating Ontario's response to the silicosis problem.

A notable emphasis was also placed on limiting who would be eligible for compensation. After a miner was hired, it was suggested that he require five years of experience in Ontario mines before becoming eligible for compensation. This would protect the employer from liability for silicosis exposure for which he was not responsible. First stage silicotics who presented themselves for examination every six months and who showed signs that the disease had progressed to the next stage were to be eligible for a higher level of compensation. If after two years, a man's condition had not deteriorated, it was felt that he should be declared ineligible for further compensation.²⁴

At the same time as they proposed strict eligibility requirements for employment and compensation, Sutherland and Bell also displayed a calculating sense of paternalism. It was felt that men forced to leave mine employment on account of silicosis should be given assistance, beyond the nominal compensation settlement, in finding another job, preferably in a silica free branch of the mining industry. It was hoped the mining companies would assist with this. In addition, it was proposed to use the services of the Ontario Government Employment Agencies. The rationale behind these proposals was "humanitarian" and "economic."²⁵ By economic, it was probably feared that silicotics not assisted in finding new employment would become a costly burden to the state.

The plans for the introduction of an official silicosis policy were finalized at a meeting of the silicosis committee on 17 March 1926. On the recommendation of V.A. Sinclair, chairman of the Workmen's Compensation Board, it was agreed that silicosis should be classified as a separate disease, in order to narrow the range of compensation

²³ Memorandum to Charles McCrea, Minister of Mines from T. Sutherland, Chief Inspector of Mines, [February 1926], AO RG13-21-0-30, Silicosis File.

²⁴ Ibid.

²⁵ Ibid.

claims that could be made against the mining companies and to avoid making the eligibility for compensation retroactive. The definition of silicosis to be used by the Workmen's Compensation Board was proposed by A.F. Brigham, general manager of Hollinger Mines, and seconded by H.P. DePencier, general manager of Dome Mines. While one might question the practice of allowing the operators to propose their own definition, the classification appears to be based on the South African definition of silicosis. It was also decided to delay the introduction of medical exams until further studies on the incidence of silicosis could be conducted, although Hollinger, Dome, and McIntyre stated their intention to examine all prospective employees prior to hiring them.²⁶

The results of the silicosis surveys, Sutherland's South African tour, and industry meetings led to the amendment in April 1926 of the Workmen's Compensation Act to include "silicosis occurring in mines." To receive compensation for one of the three identified stages of silicosis (ante-primary, primary, and secondary), an afflicted miner had to demonstrate that he had been exposed to silica dust in Ontario in all five years prior to disablement. The amendment was not retroactive, as it was considered unfair to require the Board to finance cases for whom liability assessments had not been made. Those who had quit their mining job prior to its enactment were only eligible to be compensated for miners' phthisis, for which tuberculosis had to be present, not just silicosis. These various restrictions served to limit the number of miners eligible for compensation, including one who left mining in 1924 to farm and who was unable to continue farming by 1932 on account of disability from silicosis.²⁷

When it was verified that a claimant for compensation had been exposed to silica dust in Ontario mines for at least five years, his case was passed to a Silicosis Referee Board, which occasionally travelled to the mining camps to interview claimants. The Board was composed of three representatives from the Ontario Department of Health, two of whom gave a physical examination to the claimant. After the examination, the results were evaluated by all three members of the Board and upon reaching a unanimous decision, the

²⁶ Memorandum of a meeting of the Silicosis Committee, 17 March 1926, AO RG13-21-0-30, Silicosis File.

²⁷ Cunningham, "Silicosis in Canada," 321; T.F. Sutherland, Acting Deputy Minister of Mines to George W. Thom, Barrister, 14 March 1932, AO RG 13-13-0-46, Department of Mines, Central Registry Files.

diagnosis was passed on to the Compensation Board. As was the case for all accident and illness claims, the decision could be appealed by either the miner or the employer if new evidence became available.²⁸

The restrictions placed on who was eligible for compensation prevented many sick miners and ex-miners from collecting the compensation they should have received for sacrificing their health to enrich mining company shareholders. For example, two men with silicosis who had worked underground at Porcupine for six and seven years were ineligible for compensation because the disease had developed nine and ten years after the men had left mining to work in forestry, despite the fact that saw dust did not cause silicosis. The moral for these men was that to obtain silicosis compensation, one either worked underground until too sick to continue or else one became sick as soon as possible after quitting mine work.²⁹

Miners who filed a successful compensation claim had to cease employment exposing them to silica dust if they wished to remain eligible for further compensation in the event that their disease progressed to a more serious stage. Those who stopped working in dusty occupations were entitled to further compensation depending upon the progression of the disease.³⁰

Compensation varied with the stage of the disease. A claimant found to be in the ante-primary stage was granted \$500. This sum was intended to assist the miner in finding new employment in a silica free environment, not in recognition of damaged health. A primary stage claimant was awarded \$1 000, an acknowledgement that the reduced physical capabilities accompanying this phase of the disease caused the miner greater difficulty in finding alternative employment. A secondary stage claimant classified as disabled received 66 2/3 percent of his previous wages, in addition to medical and hospital care. When a miner died from silicosis, a pension was paid to his family.³¹ The rationale behind compensation levels suggests the prevailing attitude towards worker's compensation was that it existed to cover lost earning power, not the damage done to one's health by an unsafe or unhealthy

²⁸ Cunningham, "Silicosis in Canada," 323.

²⁹ Ibid., 325.

³⁰ Ibid., 323.

³¹ Memorandum from D.G. Sinclair, Chief Inspector of Mines, 13 January 1933. AO RG13-21-0-26. Silicosis File.

workplace. By extension, it can be argued that workers were not entitled to a safe or healthy workplace.

Such an argument is bolstered by the minutes of a meeting between company and government officials held seven months after the passage of the first silicosis legislation. By 1926, some members of the Ontario mining industry had created a silicosis committee to coordinate the corporate response to the disease. At a meeting held in the Hollinger Mine Office in Porcupine on 3 November 1926, ten representatives of the mining companies met with invited representatives of the Ontario and United States governments.³² The participants discussed problems emerging in the compensation of silicosis. These problems did not include ways of reducing the incidence of silicosis, but rather ways of controlling compensation costs by tightening eligibility requirements. V.A. Sinclair of the Workmen's Compensation Board stated:

It was the Board's original understanding that all cases of silicosis, which were awarded compensation, were being taken out of the mine. The Board now finds, however, that some of these men who have been receiving their award, are not leaving their employment.

As the payment of \$500 is not an award for disability, but was supposed to cover the lost time and expenses of a man moving himself and possibly his family from one place of employment to another, the Board has decided that it will not make any further awards [for the advancement of the disease] as long as cases are employed underground.³³

Sinclair went on to inform the meeting that a letter explaining this position was now sent to all men awarded compensation. It is not known whether miners receiving compensation were aware of this stipulation or if they treated the compensation as a financial windfall and then continued to risk their health in the only occupation they knew well.

The principle of compensation for impaired work ability, not damaged health, was expanded on as the meeting progressed. Dr. Haig wanted to know how men were to be classified as ante-primary, primary, and secondary when no medical definition was provided. Sinclair advised Haig that determination of the primary and secondary stages should be based

³² The invited guests were V. A. Sinclair, Chairman of the Ontario Workmen's Compensation Board; Dr. Bell, Chief Medical Officer of the Workmen's Compensation Board; Mr. Graham, Head of the Claims Department of the Workmen's Compensation Board; Dr. Haig and Dr. Bain, the leading medical experts on silicosis in Ontario; Dr. R.R. Sayers and Dr. E. Harrington of the United States Bureau of Mines.

³³ "Minutes of a Meeting of the Silicosis Committee," 3 November 1926, AO RG13-21-0-44, Silicosis File

on the impairment of one's ability to work.³⁴ For the Workmen's Compensation Board, industrial disease was defined not in medical or scientific terms, but in terms of wage-earning ability. This was underlined by the fact that Sinclair, who was not a medical practitioner, told a doctor how to classify a disease.³⁵

In response to a question, Sinclair also stated that the Board would not provide permanent disability payments to someone in the secondary stage of silicosis who was still able to work, although the Board might consider paying any difference between the income earned in mining and in the new occupation. This theoretical willingness to compensate for wage differentials indicated that the Workmen's Compensation Board recognized the difficulties men faced in finding new employment providing a similar income level. Responding to another question, Sinclair stated that the Board would probably pay further compensation to a worker taken out of the mine and engaged in surface work.³⁶

Sinclair, the dominant figure at the meeting of the silicosis committee, further advised the operators that, although silicosis compensation was being covered by the general funds of the Compensation Board, a special assessment would soon have to be made to cover an expected rise in costs. He left it up to the mining industry to decide how they wished to pay this assessment. The options put forward were an industry wide assessment or an assessment based on silicosis rates in individual mining camps. If the assessment was to be made against individual camps, the operators were also asked to decide the length of time that a miner had to be exposed to silica dust in a camp before becoming eligible for compensation.³⁷ The position of Sinclair shows that the Workmen's Compensation Board was interested in a top-down cooperative approach to compensating silicosis. Within certain minimum requirements, mine operators were given considerable leeway to customize the

³⁴ Ibid.

³⁵ Silicosis provides a fascinating case study in the social definition of disease. For such a study, see Gerald Markowitz and David Rosner, "The Illusion of Medical Certainty: Silicosis and the Politics of Industrial Disability, 1930-1960," in *Framing Disease - Studies in Cultural History*, ed. Charles E. Rosenberg and Janet Golden (New Brunswick, New Jersey: Rutgers University Press, 1992), 186-205.

³⁶ "Minutes of a Meeting of the Silicosis Committee," AO RG13-21-0-44, Silicosis File.

³⁷ Ibid. Eventually a Silicosis Fund was created to cover the costs of compensating silicotic miners. The fund was collected from mine operators with assessments based proportionally on the incidence of silicosis calculated according to shifts worked. This meant that each case of silicosis granted compensation added to the assessment costs of the operators and gave them incentive to find ways of evading liability.

industry's approach to compensation. It does not appear that a similar courtesy was extended to the workforce of the mines.

The members of the silicosis committee agreed to a temporary silicosis levy based on the incidence of the disease in each camp (Porcupine, Kirkland Lake, Sudbury, and the silver mines). However, they also stated a desire to eventually follow the standard procedure of the Compensation Board, which recognized the principle of collective responsibility by industry.³⁸ Considering that the companies involved in the silicosis committee were likely those for whom silicosis was a problem, the principle of industry responsibility was probably desired because it would place some of the burden for silicosis assessments on operators whose mines did not cause silicosis. This represents one of the earliest attempts by the mine operators to reduce their financial responsibility for silicosis acquired in their mines. As Table 2 shows, the early indications about the seriousness of this responsibility appeared daunting. The first chest x-ray examinations at the McIntyre Porcupine Mine found that seven of the roughly 600 employees were already in the most advanced stage of silicosis. Particularly alarming was the young age of these men. Most were only in their 30s and none were over 50. As a result of the young age at which silicosis became disabling, the average age at death was a mere 46. As the workforce aged, the situation was likely to get worse - and more expensive.³⁹

Conspicuously absent from the development of the silicosis policy were the miners suffering from the disease. In 1927, the Mine Workers' Union of Canada informed the government of its opposition to certain provisions in the legislation and proposed alternatives. These alternatives were characterized by a desire to see more generous benefits and to reduce the power advantage the companies possessed in the claims determination process. The Timmins local of the Mine Workers' Union protested that \$500 was inadequate compensation for the ante-primary stage of silicosis and that the amount was less than the compensation paid to South African miners.

³⁸ Ibid.

³⁹ Angus D. Campbell, "Prevention of Silicosis at the McIntyre Porcupine Mine, Schumacher, Ontario," Paper presented at the Conference of the McIntyre Research Foundation, 22-24 October 1956, AO RG13-20-0-93, Ontario Department of Mines, Mines Inspection Branch - Reports, Papers, and Proceedings.

Table 2 - Total Disability Cases Discovered between 1925-1927
at the McIntyre Porcupine Mine

Year Rated Total Disability	Age	Year Left Dust Exposure	Age	Year of Death	Age
1925	33	1925	33	1932	40
1926	39	1926	39	1926	39
1926	42	1926	42	1930	46
1926	48	1929	51	1931	53
1926	37	1927	38	1936	47
1927	39	1925	37	1930	42
1927	39	1925	37	1943	55
Average Age	39.6		39.6		46

Source: Angus D. Campbell, "Prevention of Silicosis at the McIntyre Porcupine Mine, Schumacher, Ontario," Paper presented at the Conference of the McIntyre Research Foundation, 22-24 October 1956, AO RG13-20-0-93, Department of Mines, Mines Inspection Branch - Reports, Papers, and Proceedings.

More interesting were the union's suggestions respecting the non-monetary aspects of the legislation. The first recommendation called for the establishment of a Medical Board to examine silicosis cases in order to remove the responsibility for silicosis detection from company doctors. The union reported several instances where men were told that although they showed signs of silicosis, they did not have the disease. It was felt that the company doctors were giving the benefit of doubt to the operators in cases where disability had not yet occurred, in contravention of the legislation, which provided for compensation when the disease was present in the ante-primary stage, regardless of disability. This proposal sought to remove company doctors from the process of diagnosing industrial disease and reflected a long-standing antipathy towards company doctors.⁴⁰

The federal government was called upon to assume responsibility for silicosis, which was seen by the union to be a national problem present in all hard-rock mining areas. It was considered "odious" by the union that five years of consecutive employment in Ontario mines was required in order to qualify for compensation.⁴¹ The proposal for a national silicosis policy may have reflected the view that a miner with silicosis was entitled to

⁴⁰ A.M. Stuart, Secretary, Timmins Unit, Mine Workers' Union of Canada to Charles McCrea, Minister of Mines, 28 March 1927, AO RG13-21-0-32, Silicosis File. Derickson, Workers' Health, Workers' Democracy, 89.

⁴¹ A.M. Stuart to Charles McCrea, AO RG13-21-0-32, Silicosis File.

compensation no matter where he had worked or for how long. Obtaining compensation was naturally more important to the union than respecting the individual liability of mining companies.

The proposal also reflected the mobility of many miners, who had a tradition of travelling around Canada and the United States in search of the best pay and working conditions. Many miners may have seen this mobility as an assertion of their independent status as contractors and as a resistance against becoming corporate employees. In addition, mobility was one of the few recourses available to a miner unhappy with his employer.⁴² In an age offering little job protection, mobility would have also been an essential survival strategy for miners fired or laid off from their job. Given the prominence of mobility in mining culture, the five year rule would have been viewed negatively because it either reduced the mobility of a miner should he wish to remain eligible for compensation or it denied a miner the chance to receive compensation should he wish to seek work in another province. For example, a man who had worked for many years in the metal mines of British Columbia ran the risk of developing silicosis three years after his arrival in Ontario. Unable to work, he would have been ineligible for compensation. Similarly, if a man who had worked most of his life at Porcupine moved to British Columbia and developed silicosis three years after his move, he would not be entitled to compensation should he return to Ontario, even though that was where he had been exposed to silica dust.

The final proposal put forward by the Mine Workers' Union was for the creation of a separate board to handle compensation claims for silicosis, as it was felt the Workmen's Compensation Board was unable to devote the necessary time and expertise to the issue. The desire for a voice in the policy process was reflected in this proposal, as the special board was to be composed of members from each mining area acceptable to both mine workers and mine owners.⁴³

The letter from Stuart was not a one man effort. The letter was accompanied by a resolution passed by the local membership supporting the proposals. In addition, the

⁴² Miner mobility is discussed in Derickson, Workers' Health, Workers' Democracy, 14, 67 and in "Industrial Refugees: The Migration of Silicotics from the Mines of North America and South Africa in the Early Twentieth Century," Labor History 28 (1988): 70.

⁴³ A.M. Stuart to Charles McCrea, AO RG13-21-0-32, Silicosis File.

resolutions received considerable coverage in the local press. Both the Porcupine Advance and the Citizen reported at length on the meeting and carried editorials supporting the union's stand, although the Advance's support was lukewarm, offering as much praise for the government's existing legislation as for the proposed improvements. In contrast, the Citizen declared silicosis to be a national problem requiring federal direction of compensation. The paper framed the mobility of miners as essential to national progress. If miners were reluctant to move for fear of losing their compensation eligibility, "the development of the mineral wealth of Canada [was] likely to be retarded and the ratio of accidents, due to the employment of inexperienced men will remain relatively high."⁴⁴ The barrage of documentation accompanying this set of resolutions demonstrates that in northern mining communities, silicosis was an issue of considerable importance.

In order to finalize its silicosis policy, the government of Ontario hired a South African silicosis expert to investigate the status of the disease in the province and to recommend the most appropriate action. Dr. J. Michael Smith of the South African Medical Board of Appeal was considered to be one of the world's two leading experts on silicosis. From April to June 1927, Smith visited Ontario, inspecting the northern hardrock mines and examining the x-rays from the Department of Health's silicosis surveys. In addition, he held meetings with various mine operators and the silicosis committee of the Ontario Mining Association, the Workmen's Compensation Board, and representatives of the Mine Workers' Union. Smith's consultations thus represent the first documented inclusion of working-class representatives in the development of Ontario's silicosis policy.⁴⁵

In his final report to the minister of mines, Smith stated that while he did not find the situation alarming, he thought it would be in the best interests of the mining industry, the miners, and the state to deal with the medical aspect of the problem. Following his preamble were eight recommendations. They focused on the creation of a three-member Silicosis Referee Board attached to the Workmen's Compensation Board to advise the Board on medical matters and to direct a system of medical examinations. He suggested that medical

⁴⁴ The articles and editorials ran on March 31, 1927. The clippings are located in the Silicosis File of the Mines Inspector Branch, AO RG13-21-0-32.

⁴⁵ Notes made by T.S. Sutherland, Chief Inspector of Mines, AO RG13-21-0-45, Silicosis File.

examinations be given to prospective miners and annually to working miners in order to detect tuberculosis and silicosis. To address labour suspicions of company doctors, Smith recommended that the medical officers attached to the Silicosis Referee Board be paid by the Compensation Board.⁴⁶

In April 1928, the Mining Act of Ontario was amended in order to implement the recommendations of Dr. Smith. Each person seeking employment in Ontario mines was to undergo a physical examination to ensure that they were free of pulmonary tuberculosis. Those employed had to be examined annually in order to obtain a "Certificate of Freedom from Pulmonary Tuberculosis," valid for twelve months (Figure 1). Without this certificate, it was illegal to work in an Ontario mine. The certificate was to be retained by the mine manager or superintendent on behalf of the miner until his next examination or the end of his employment in the mine.⁴⁷ A similar policy had been proposed in 1926, but not implemented. Another amendment to the Mining Act clarified tuberculosis of the respiratory organs to be a condition in which the patient's expectorate contained the tubercle bacillus or in which the patient had tuberculosis "to such a degree as to seriously impair his working capacity and to render prohibition of work underground advisable in the interests of his health."⁴⁸ Further amendments also provided for the appointment of medical officers to perform the mandatory examinations of miners. The examinations were conducted under the supervision of the Workmen's Compensation Board. Responding to labour suspicions of company doctors, the examining physicians were employed by the Board and paid out of assessments levied on mine operators to cover the costs of silicosis compensation. Cases of silicosis or silicosis with tuberculosis discovered during the examinations were submitted by the doctors to the Compensation Board. The claims included employment history, medical history, and x-ray examination records.⁴⁹

⁴⁶ Report of Dr. J. Michael Smith submitted to Charles McCrea, Minister of Mines, 8 June 1927, AO RG13-21-0-45, Silicosis File.

⁴⁷ Cunningham, "Silicosis in Canada," 322.

⁴⁸ Ibid.

⁴⁹ Ibid.



THE MINING ACT
ONTARIO

CERTIFICATE OF
FREEDOM FROM PULMONARY TUBERCULOSIS

Serial Number..... Date.....

Name.....

Address.....

Nationality.....

Married..... Single..... Age.....

Signature of Workman.....

*Personal Photograph
Full Face View*

Photograph to be also signed

THE WORKMEN'S COMPENSATION ACT
ONTARIO

This Certifies that I have examined

.....
whose photograph is attached hereto and have found
him free from tuberculosis of the respiratory organs.

If required by the Manager or Superintendent, this
certificate shall be delivered to him, and shall remain in
his custody until the holder is discharged.

DOCTOR'S SIGNATURE

.....
1. Date due for re-examination

.....
Examined— Doctor's Signature

.....
2. Date due for re-examination

.....
Examined— Doctor's Signature

.....
3. Date due for re-examination

.....
Examined— Doctor's Signature

*N.B.—The holder of this certificate must be re-examined not later than twelve months from date of initial examination, and
annually thereafter.*

Figure 1 - Certificate of Freedom from Pulmonary Tuberculosis
Source: AO RG13-13-0-45, Department of Mines, Central Registry Files.

The 1928 revisions to the Mining Act merely formalized the practices of Porcupine and Sudbury mine operators. Managers from these areas already conducted X-ray examinations of underground workers and prospective employees. In 1929, the first full year in which medical examinations were mandatory, approximately 3 000 miners were examined in the Porcupine area, 1 793 in Kirkland Lake, 1 434 in Sudbury, and 662 in Cobalt.⁵⁰ It is worth noting that Porcupine, where silicosis posed a serious threat, was also the largest mining area in employment terms. The silicosis danger in Porcupine was reflected in the 1929 silicosis rates for each area. In Porcupine, 3 percent of underground workers showed evidence of one of the three stages of silicosis, while roughly 1 percent presented signs of the disease in Kirkland Lake and Sudbury; fewer than .4 percent of the miners in Cobalt had silicosis. With the exception of Porcupine, for which no data is given, the average length of exposure to silica dust for miners with silicosis in each of the other three areas ranged between eleven and thirteen years.⁵¹

In the three and one-half years between April 1926 and January 1930 that silicosis was recognized as a compensable disease, 184 cases of silicosis were compensated. Of these, 91 cases were ante-primary, 58 cases were primary, and 33 cases were secondary. Cunningham felt the proportion of secondary cases to total cases was higher than normal.⁵² It should be noted that these figures exclude genuine cases of silicosis in which one of the other eligibility requirements was not met. In the Porcupine area, many of those who acquired silicosis died. Of the 27 secondary cases compensated to January 1930, 15 died. Of 17 secondary cases compensated in 1926, 9 died the same year. This figure suggests a backlog of cases where silicosis had long been present, but deemed ineligible for compensation. The average length of time between compensation, which usually occurred shortly after disability, and death, was sixteen months. Porcupine miners receiving compensation for secondary stage silicosis who were still alive on 1 January 1930 had lived an average of 27 months from the date compensation was awarded.⁵³ For whatever reason, some people died from silicosis more quickly than others, just as individual susceptibility to

⁵⁰ Ibid., 322-3.

⁵¹ Calculated from data provided in Ibid., 323.

⁵² Ibid., 324.

⁵³ Ibid.

the disease varied. Whether this was due to physical characteristics, the job performed underground, chance, or some other factor was unclear.

In the early days of silicosis research there was a great deal of uncertainty over the relationship between tuberculosis and silicosis.⁵⁴ One of the benefits of the many surveys conducted by the Ontario Department of Health was the clarification of this issue. While many cases of silicosis were found to be present with tuberculosis, the rate of tuberculosis among miners or in the families of miners was found to be comparable to statistics for other industrial workers. The assumption remained, though, that the presence of tuberculosis made a person more susceptible to silicosis.⁵⁵

The x-ray examination of job applicants hampered the employment prospects of many, with the rejection rate varying between five and ten percent from area to area. This percentage was considered low compared to the rate of rejection in South Africa. Cunningham speculated that this was due to the language of the Ontario certificate, which merely specified that a man was free from tuberculosis, not that he was fit to work underground. The mining companies benefitted from the pre-employment exams because they did not become liable for silicosis cases for which they were not responsible.⁵⁶ The tragedy of this situation was that many of the men denied employment eventually became too sick to work, yet ineligible for compensation, their last days were spent in poverty. It would also be interesting to know if the medical examinations were used to keep out undesirable men, such as union organizers. Unfortunately, the sources examined do not permit such an evaluation.

The operators derived an unforeseen benefit from the minimum employment requirements needed to qualify for compensation and from pre-employment medical examinations. The efforts to control and contain compensation costs enhanced the stability of the workforce. Although the companies attributed a decrease in the percentage of labour turnover to other factors, the chief inspector of mines related the increased stability to the compensation legislation: "Men are not so ready to move around when they know their cases

⁵⁴ Extracts from "Sputum and the Gold Miner," AO RG13-21-0-16. Silicosis File.

⁵⁵ Cunningham, "Silicosis in Canada," 326-8.

⁵⁶ *Ibid.*, 325.

if bordering on compensation are injured by a change of place."⁵⁷ If a man suspected that he might not pass a pre-employment medical exam, he would have been even more reluctant to change employers. The fears of the miners about a reduction in their mobility proved all too true. In this light, the compensation legislation was an extension of company control over the lives of employees. Miners had long protested low wages, unrealistic production demands, and unsafe or unhealthy working conditions by changing employers. This option was no longer available to men for whom compensation was an issue.

By the 1930s, it was becoming clear that silicosis was a growing problem for the Ontario mining industry. A dramatic rise in new cases of silicosis in 1931 caused considerable consternation in mining circles. The figures in Tables 3 and 4 express the situation. There was considerable evidence by this time that the main source of silicosis was the gold mines. This evidence was strengthened by the fact that many of the miners with silicosis in silver and base metal mines had worked in gold mining. In gold mining, just over one miner for every one thousand employed died from silicosis. The high rate of miners with the first stage of silicosis meant that in a few years, the death rate would likely increase as the disease progressed in these miners. The figures also show that as the Depression continued, employment was declining in silver and base metal mining, but increasing in gold mining, augmenting the number of miners exposed to dangerous levels of silica dust.⁵⁸ The mining companies and their government allies interpreted the statistics to mean that the Ontario mining industry had a compensation problem, while the miners continued to worry about the industry's silicosis problem.

The Department of Mines had a long record of cooperating with the mining corporations to the detriment of labour. Fortunately, as the number of miners afflicted with silicosis continued to increase in the 1930s, the miners found a sympathetic ally in the chairman of the Workmen's Compensation Board. In 1931, V.A. Sinclair began to lobby the Department of Mines for changes to silicosis legislation. Concerned about the rising number

⁵⁷ T.S. Sutherland, Chief Inspector of Mines to [?], 12 January 1928, AO RG13-21-0-21, Silicosis File.

⁵⁸ Memorandum from D.G. Sinclair, Chief Inspector of Mines, 13 January 1933, AO RG13-21-0-26, Silicosis File.

Table 3 - New Silicosis Cases in Ontario, 1926-1931

Year	Gold Mining				Total
	Men employed	Ante-primary	Primary	Secondary	
1926*	6302	49	54	4	62
1927*	6504	27	6	10	43
1928	6949	9	3	4	16
1929	7060	2	1	10	13
1930	7468	8	7	11	26
1931	8605	31	4	9	44

*The figures for 1926 and 1927 include cases that developed prior to the enactment of silicosis compensation.

Base Metal and Silver Mines

Year	Men employed	Ante-primary	Primary	Secondary	Total
1926	2158	0	0	1	1
1927	3448	2	0	1	3
1928	5612	2	0	1	3
1929	5286	4	0	1	5
1930	4579	5	1	3	9
1931	3220	13	0	2	15

Source: Memorandum of D.G. Sinclair, 13 January 1933, AO RG13-21-0-26, Mines Inspection Branch, Silicosis File.

Table 4 - Silicosis Incidence Rates in Ontario Mines, 1926-1931

Stage of Silicosis	Gold Mines Rate / 1000 miners	Metal and Silver Mines Rate / 1000 miners
Ante-primary	2.10	1.17
Primary	0.57	0.05
Secondary	1.20	0.36
Deaths	1.15	0.04

Source: Memorandum of D.G. Sinclair, 13 January 1933, AO RG13-21-0-26, Mines Inspection Branch, Silicosis File.

of miners filing compensation claims for silicosis, Sinclair urged a tighter system of medical examinations. He argued that the existing medical approval to work as a miner, which was

acquired after being found free of tuberculosis, was inadequate because it allowed men from other provinces and countries with silicosis to pass the medical examination. It also allowed men with other lung diseases susceptible to silicosis to acquire a work permit. In Sinclair's opinion, to allow such men to work underground was to issue them a death sentence. The chairman's solution was to amend the medical certificates so that they would attest to a man's freedom from diseases of the respiratory system. While Sinclair's position, as well intentioned as it might have been, still emphasized restricting working-class employment instead of controlling dust levels, it was more moderate than the position of the mine operators, who wanted the certificate to cover a man's fitness to work as a miner, which seemed like a very subjective assessment.⁵⁹

The first recommendation of Sinclair should not overshadow his other proposals, which addressed the hardships faced by silicotic miners, especially in the harsh economic climate of the Great Depression. Sinclair knew of many cases where miners were diagnosed with ante-primary silicosis by a medical officer. When employers learned of this condition, the miners were dismissed from their jobs. However, the Silicosis Referee Board often found that these men did not have silicosis in a compensable form. As employers generally refused to rehire these silicotics, the miners found themselves unemployed. Sinclair's recommendations were that mine owners agree not to lay off silicotic miners until compensation was awarded and that medical officers not inform employers of an employee's condition until compensation was awarded.⁶⁰

Sinclair also wanted the government and mine owners to play a greater role in finding new employment for those awarded compensation for ante-primary and primary silicosis. The motivation behind this proposal was that many of those awarded compensation resided in one of the four mining camps with their families. In the dismal job market of the 1930s, compensation awards were often spent before new employment could be found by these men. As a result, they were frequently forced to go on municipal relief, to the annoyance of both the men concerned and the general public, who saw men forced out of

⁵⁹ Memorandum from V.A. Sinclair, Chairman, WCB to Charles McCrea, Minister of Mines, 6 August 1931, RG7-14-0-25, Department of Labour, Legislation Files.

⁶⁰ Ibid.

their jobs and left with no alternative relief. Sinclair suggested following the South African practice of finding dust-free employment or non-mining employment for the men no longer eligible to work underground. A similar proposal had been made in 1926 and never implemented, perhaps because it lacked the support of the Department of Mines and the mine operators, who sought to free themselves of all responsibility for men with silicosis.⁶¹

A similar proposal would have allowed men with advanced silicosis to keep their employment. Sinclair questioned whether there was any benefit in forcing a man to quit his job when it was too late for his condition to improve and the only uncertainty was the exact timing of the man's death. It was suggested that such men would often be "happier and much better off continuing in their employment where they are contented and supporting their families" than they would be sitting at home worrying about their condition. In this situation, the men would still be entitled to compensation when they became too ill to work. Such a policy was reportedly in place in South Africa. This proposal essentially argued that it was pointless to condemn men to the poverty of disability payments as long as they could gain more money and satisfaction from working, at almost no additional risk to the health of their lungs.⁶²

The final recommendation of Sinclair was that sanatoria be built in several of the mining camps so that men in the advanced stage of silicosis could receive proper treatment close to their families. With no sanatoria in the north, miners generally refused to travel south for treatment, as they did not want to leave their families. Sinclair believed this practice endangered the men's families when tuberculosis was present with the silicosis, as the tuberculosis could easily be passed on to wives and children. It was proposed that the mining companies could help the government finance the construction and operation of northern sanatoria.⁶³ This was a radical proposal, as Sinclair was advocating that the mine

⁶¹ Ibid.

⁶² Ibid. A 1931 South African report confirmed suspicions that silicosis progression rates were not significantly affected by removing the silicotic from work in dust. It had previously been thought that a man's condition would stabilize after about five years of dust-free living.

⁶³ Memorandum from V.A. Sinclair to Charles McCrea, RG7-14-0-25, Department of Labour, Legislation Files.

operators divert some of their profits to the care of the men who lost their health creating those profits. Not surprisingly, no sanatoria were built in the mining camps.

Sinclair's suggestions do not seem to have found favour among the men responsible for the province's mining industry. A high level meeting was held "at the instigation" of Sinclair on 5 August, 1931 to consider ways of alleviating "some of the hardships imposed" by existing legislation on silicosis. The first topic of discussion involved potential changes to the medical certificate required to work in Ontario mines. G.C. Bateman, representing the Ontario Mining Association, made it known that the existing certificates were a hardship on employers because men who were physically unfit for underground employment, through the presence of silicosis or a predisposition to silicosis, were permitted to work. It was then agreed by the meeting to change the certificate from a certification of freedom from tuberculosis to a certification of freedom from diseases of the respiratory system. It was also agreed that employers should not be notified that an employee had silicosis until compensation was granted, although the practice reportedly continued.⁶⁴ The other matters regarding greater assistance in the search for new employment, the continued employment of terminally ill miners, and the construction of sanatoria were deferred for further study.⁶⁵ The construction of northern sanatoria for tubercular silicotics was opposed by the mining corporations because they already felt they were carrying an unfair burden of silicosis costs on account of the prevalence of tuberculosis in northern Ontario. It was argued that climate and housing conditions in the north made people more susceptible to tuberculosis than elsewhere. Since these were things beyond the control of the mines, it was argued that the province was responsible for managing tuberculars and should therefore assume the costs of hospitalizing them.⁶⁶ In plain language, the operators were blaming the costs of compensating silicosis contracted in their mines on the presence of tuberculosis in the north, due to the rapid disabling effect tuberculosis had on silicotics. Once again, mine operators

⁶⁴ A reference to medical examiners informing employers about silicotic miners is contained in a "Memorandum re. Silicosis Legislation," by D.G. Sinclair, Chief Inspector of Mines, 24 February 1937, AO RG13-21-0-29, Silicosis File.

⁶⁵ "Notes on Meeting to Discuss Various Matters in Respect to the Working of the Silicosis Laws," 5 August 1931, RG13-21-0-50, Silicosis File.

⁶⁶ G.C. Bateman, Secretary, Ontario Mining Association to Charles McCrea, Minister of Mines, 31 August 1931, AO RG13-13-0-45, Department of Mines, Central Registry Files.

and government officials cooperated to limit compensation costs and working-class access to employment, while refusing to consider ways of easing the hardship caused by silicosis and regulations to control the disease. The most plausible reason for their refusal to assist affected miners was the cost involved, in terms of both revenue expenditures and the decreased productivity that would result from the employment of sick workers.

In light of this meeting, the question arises why V.A. Sinclair was more sympathetic towards the plight of the miners than his peers, as this was not the first time that he had represented the views of the miners. In 1928, when the policy on medical examinations was being formulated, Sinclair had recommended that the medical examinations be placed under the control of the Compensation Board and that no company doctors be employed, in order to appease the labour unions.⁶⁷ While he may have been a progressive thinker, his views could also have been shaped by his occupational status. The role of the Compensation Board was to provide a means of support to injured and ill workers who met the eligibility requirements. When the Board was unable to fulfill this responsibility, Sinclair may have felt duty bound to point out the shortcomings of compensation legislation. This contrasts with the predominant view within the Department of Mines that its role was to promote the development of the Ontario mining industry.⁶⁸ It may have been that his position on the Compensation Board exposed him to the suffering of injured and sick workers. In addition, the presence of a labour representative on the Compensation Board would have made him aware of working-class grievances.

Sinclair was not the only person concerned about the injustices of silicosis compensation. The Timmins branch of the One Big Union passed a motion protesting the examination of new employees by company doctors, even though they had been declared eligible for underground work by Compensation Board doctors. It was felt the continuing influence of company doctors nullified the requirement that silicosis x-rays be performed by Board doctors to end the abuse of silicotics by corporate physicians. Instead, miners free of tuberculosis were declared fit for work by the medical examiners and then denied

⁶⁷ V.A. Sinclair, Chairman, Workmen's Compensation Board to Charles McCrea, Minister of Mines, 26 March 1928, AO RG13-21-0-37, Silicosis File.

⁶⁸ For the origins of this attitude, see Philip Smith, Harvest from the Rock - The History of Mining in Ontario (Toronto: MacMillan, 1986), 89-94.

employment by company doctors on the grounds that they had silicosis or some other medical condition. This left the miners unable to work and unable to qualify for workers' compensation.⁶⁹ However, private property rights ensured that the mines could reject a man for employment for any reason they desired. Management was merely exercising its rights in conducting supplementary medical examinations.

In addition to participating in collective protests, desperate miners appealed to the minister of mines, Charles McCrea, to assist them in winning reconsideration for their rejected compensation claims. The complaints illustrate the effectiveness of bureaucratic regulations in reducing the number of silicotics eligible for expensive disability pensions, the pettiness of some Compensation Board decisions, and the role of tuberculosis in increasing the level of conflict surrounding silicosis compensation.

Many men disabled by silicosis were refused pensions because they had previously been granted \$500 or \$1000 for non-disabling silicosis with the condition that they leave dusty employment in order to be eligible for further compensation. Some miners in receipt of these awards continued to work in dust for a variety of reasons. It appears that many of these men were diagnosed with silicosis during the initial 1927 x-ray examination of all miners and subsequently awarded compensation in an effort to get them to leave employment in mining before they developed disabling silicosis. These miners had not been aware that a compensation award would require them to leave their job. With no other plans or possessing no desire to risk their economic security and uproot their families, they continued to work underground.⁷⁰ Foreign-born miners frequently did not understand the

⁶⁹ T.B. Roberts, One Big Union, Timmins to Charles McCrea, Minister of Mines, 9 January 1932, AO RG13-13-0-55, Department of Mines, Central Registry Files; T.B. Roberts, One Big Union, Timmins to Charles McCrea, Minister of Mines, 13 February 1932, AO RG13-13-0-55, Department of Mines, Central Registry Files; Dr. N.W. McBain, Miners' Chest Examining Station, Kirkland Lake to T.F. Sutherland, Acting Deputy Minister of Mines, 25 July 1933, AO RG13-13-0-55, Department of Mines, Central Registry Files. It should be remembered that a miner's certificate only stated a person was free from tuberculosis. Silicotics were not prohibited from working underground, although companies were reluctant to employ them, as they represented a compensation case waiting to happen.

⁷⁰ Ed Donohue, Secretary, One Big Union, Timmins to Charles McCrea, Minister of Mines, 19 August 1932, AO RG13-13-0-46, Department of Mines, Central Registry File; T.F. Sutherland, Acting Deputy Minister of Mines to Ed Donohue, Secretary, One Big Union, Timmins, 2 September 1932, AO RG13-13-0-46. The Ontario Freedom of Information Act prevents the disclosure of any personal information such as names and identifying characteristics contained in RG13, Series 13.

letter sent to them by the Compensation Board outlining the stipulations of their award.⁷¹ Other miners with silicosis seem to have applied for compensation on the advice of medical examiners with the mistaken expectation of receiving a disability pension. When they only received a one time payment, they were compelled to continue working, particularly when jobs were scarce after the onset of the Depression or when the claimant was too old to have any success in seeking new employment. One miner over sixty years of age objected to his forced removal from underground employment because he had "never asked to be taken out of the mine; on the contrary, I was willing to work to death rather than worry and have nothing to live on for the rest of my life."⁷² There were also instances in which restrictions against dust employment were enforced with a mean-spiritedness. This was the case with one Timmins miner who left underground work in 1928 and accepted a job doing clearing and surface work in the Red Lake area. When surface jobs were no longer available at the end of the season, he worked underground for two weeks to earn enough money to return home to Timmins. This two week stint underground was used as the basis for denying the man a disability pension, even though two weeks in a low silica mine was likely not long enough to cause his silicosis to progress to the disabling stage.⁷³ In none of these instances was it proposed to reassess the case.

The Workmen's Compensation Board liked to punish miners awarded compensation for ante-primary or primary silicosis who then had the nerve to develop secondary silicosis. These people were forced to pay back their original award through deductions made from their pension cheques. One silicotic who quit work in the spring of 1931 received only one-half of the 66 and 2/3 percent of his former income that he was entitled to because of the need for him to reimburse the Compensation Board for his earlier award of \$1000. This man complained that he found it difficult to support a family of five on \$42.34 a week. The Board sympathetically responded by only deducting one-third off of each cheque. Even

⁷¹ D.G. Sinclair, Chief Inspector of Mines to T.F. Sutherland, Acting Deputy Minister of Mines, 4 July 1934, AO Rg13-13-0-55, Department of Mines, Central Registry Files.

⁷² [Confidential] to Charles McCrea, Minister of Mines, 19 August 1932, AO RG13-13-0-45, Department of Mines, Central Registry Files.

⁷³ W.O. Langdon, Barrister to V.A. Sinclair, Chairman, WCB, 1 March 1934, AO RG13-13-0-55, Department of Mines, Central Registry Files; D.G. Sinclair, Chief Inspector of Mines to T.F. Sutherland, Acting Deputy Minister of Mines, 4 July 1934, AO RG13-13-0-55, Department of Mines, Central Registry Files.

receiving two-thirds of two-thirds of his former income, the miner found it difficult to maintain the life insurance policies he had on each member of his family. He felt he was suffering on account of the erroneous diagnosis of primary silicosis initially made by the Compensation Board. Since these deductions to pay back previous compensation awards were Board policy, nothing could be done to alleviate the man's situation.⁷⁴

The restriction against tuberculars working underground became a focal point for working-class antagonism towards Ontario's silicosis legislation. Since tuberculosis was not rated as an occupational disease, a positive diagnosis was devastating to a miner. One such man complained that "I don't know what the government intends to do with all those men who have been taken out of the mine. There is nothing else to do in the North for a man except mining. The government may as well take these men and shoot them as to let them starve." Backed by medical testimony that he was free of tuberculosis and feeling powerless in his confrontation with the law, this miner drew upon his only weapon, the ballot, and threatened to switch his vote from Conservative to Liberal if he was not dealt with fairly.⁷⁵ The threat gained the attention of the Conservative minister of mines, who inquired into the man's case, only to learn that he had inactive tuberculosis and, considered a poor risk underground, he had been placed in surface work. He lost his job not because of his tuberculosis, but because the mine he worked for closed down.⁷⁶ This example still illustrates that there was a widespread perception in the north that many men were unjustly thrown out of work or denied compensation on account of the links between tuberculosis and silicosis. This negative perception was based on the large numbers of miners unemployed on account of tuberculosis. It was also felt that the medical examiners wielded their authority arbitrarily, refusing to reissue certificates to miners with laboratory evidence that they did not have tuberculosis. In addition, the examiners were accused of renewing mining certificates

⁷⁴ [Confidential] to A.F. Kenning, M.P.P., 8 April 1932, AO RG13-13-0-45, Department of Mines, Central Registry Files; T.F. Sutherland, Acting Deputy Minister of Mines to A.F. Kenning, M.P.P., 3 May 1932, AO RG13-13-0-45, Department of Mines, Central Registry Files. It is interesting that this policy was never described in the many articles written by industry and government officials praising Ontario's generous system for compensating silicosis.

⁷⁵ [Confidential] to Charles McCrea, Minister of Mines, 24 July 1933, AO RG13-13-0-55, Department of Mines, Central Registry Files.

⁷⁶ Dr. N.W. McBain, Miners' Chest Examining Station, Kirkland Lake to T.F. Sutherland, Acting Deputy Minister of Mines, 5 September 1933, AO RG13-13-0-55, Department of Mines, Central Registry Files.

year after year without warning miners that they showed signs of progressive fibrosis. It thus came as a shock when a man was refused a certificate on account of tuberculosis. The examiners argued that they were giving these cases a chance to continue working in case their situation did not become too serious. However, some men would have preferred advance notice so that they could have searched for alternative employment.⁷⁷ The effort to control silicosis through medical controls on tuberculars and other "high risk" employees, while perhaps effective in reducing the number of workers developing silicosis, brought hardship upon many miners in order to reduce the compensation burden of the mining companies. The laid off tubercular miner, however, was no better off physically, as he was still sick, and he was worse off financially, as he was surviving on relief rather than on compensation payments.

The fear of unemployment was so great that at least one miner fearful of not having his mining certificate renewed sent someone else in his place. It took over seven months for Lakeshore Mines to verify that the man working underground was not the same one whose picture was on the certificate. Mine superintendent E.W. Todd wanted to discharge the man and felt the Compensation Board should take further punitive measures. The Kirkland Lake medical examiner, Dr. McBain, thought it might be wise to prosecute the deceitful miner as a warning to others contemplating a similar plan. This proposal was nixed by T.F. Sutherland, the Deputy Minister of Mines, who felt Lakeshore Mines was actually at fault for not carefully checking the certificates of its miners.⁷⁸ If mine managers wanted to impose regulations on who was eligible to work in dust, the government was not prepared to allow the managers to shift the responsibility for enforcement onto the miners at risk of losing their livelihood on account of the regulations.

If miners thought they were treated unfairly by the silicosis compensation laws, mining companies had their complaints as well. Mine operators found that the tight

⁷⁷ [Confidential] to Charles McCrea, Minister of Mines, 1 May 1934, AO RG13-13-0-55, Department of Mines, Central Registry Files; "Memo of Facts re. [Confidential]," [March 1934], AO RG13-13-0-55, Department of Mines, Central Registry Files.

⁷⁸ Dr. N.W. McBain, Miners' Chest Examining Station, Kirkland Lake to V.A. Sinclair, Chairman, Workmen's Compensation Board, 5 August 1933, AO RG13-13-0-55, Department of Mines, Central Registry Files; T.F. Sutherland, Acting Deputy Minister of Mines to V.A. Sinclair, Chairman, Workmen's Compensation Board, 31 August 1933, AO RG13-13-0-55, Department of Mines, Central Registry Files.

restrictions on eligibility for silicosis were being circumvented by the continued existence of miners' phthisis as a compensable disease. Since the compensation of silicosis was not made retroactive, the Compensation Board deemed it wise to keep miners' phthisis on the schedule of industrial diseases for a couple of years to cover special cases in which men morally entitled to compensation would not be able to qualify under the the silicosis provisions. Both miners' phthisis and secondary silicosis were defined as silicosis with tuberculosis. The difference was that secondary silicosis required five years of dust exposure in Ontario, while miners' phthisis only required one year of Ontario mining experience and there was no time limit on filing a disability claim. This led to instances of foreign miners with silicosis qualifying for compensation in Ontario after obtaining employment in mines where x-ray requirements were not enforced. Of greater concern were miners with less than five years of experience in Ontario who developed tuberculosis and thus received compensation for miners' phthisis. This occurred as a result of the difficulty of distinguishing between general fibrosis of the lung and silica-induced fibrosis. In cases of uncertainty about how much of the fibrosis was caused by silica dust, examiners gave the benefit of the doubt to the miners and granted them compensation for phthisis, even if the fibrosis caused by silica dust was less than required for ante-primary silicosis. Such generosity with wage earners was costly to the corporate bottom line and led the Ontario Mining Association to the discovery of another disease, labelled "compensationitis."⁷⁹

The "foreign element" was particularly vulnerable to compensationitis. But even hardy Canadian boys could fall victim to this disease. According to the OMA, the best way for men with tuberculosis to gain financial security for themselves and their family was to work for a year in one of the mines that did not require x-ray certificates and afterwards claim disability from miners' phthisis. This unfairly left mining as the only industry paying compensation for tuberculosis and the OMA wanted phthisis removed from the list of compensable industrial diseases. As five years had passed since the introduction of silicosis compensation in 1926, all new cases of silicosis would meet the requirement for five years of

⁷⁹ G.C. Bateman, Secretary, OMA to Charles McCrea, Minister of Mines, 17 February 1931, AO RG13-13-0-45, Department of Mines, Central Registry Files.

exposure. On this basis, the deputy minister of mines recommended to the minister that the OMA recommendation to eliminate miners' phthisis be acted upon.⁸⁰

The members of the Ontario Mining Association claimed they were paying more than they could afford. The Silicosis Fund administered by the Compensation Board faced a steadily rising unfunded liability. It was suggested that pending assessment increases on the mining industry be cushioned by government contributions to the Silicosis Fund, something the South African government had just promised. This was a clear case of trying to shift compensation costs from the private to the public sector. A proposal was also made to further shift compensation costs onto silicotics who developed tuberculosis. The mine operators felt that the provision of full disability benefits to any silicotic developing tuberculosis amounted to a "blanket insurance policy" against tuberculosis for any person with at least five years of mining experience in Ontario. It was deemed unfair to shareholders that companies had to compensate a disease that a portion of miners would develop regardless of whether or not they were exposed to silica dust. The OMA argued that tuberculosis was not an occupational disease, but a disease common to the entire population. It was proposed that compensation benefits paid for silico-tuberculosis be lowered to account for the non-compensable hazard of ordinary tuberculosis. The difficulty of distinguishing between tuberculosis resulting from an occupational disease and regular tuberculosis was exploited by mine managers to reduce their responsibility for occupationally related tuberculosis. To emphasize their points, the operators engaged in the timeless business practice of blackmailing the government with threats to close down should compensation costs rise - a powerful tool in the depths of the Great Depression.⁸¹

The practice of sending x-ray examination results to the mining companies was defended by managers as humane. It was argued that because some areas of mines were dustier than others, particularly development headings and stopes, medical information was useful to ensure that miners with a high chance of developing silicosis were assigned to work in low dust areas. However, managers also sought to extend their supervisory influence

⁸⁰ Bateman to McCrea, 17 February 1931, AO RG13-13-0-45, Department of Mines, Central Registry Files; Thomas Gibson, Deputy Minister of Mines, "Memorandum for the Minister of Mines," 4 March 1931, AO RG13-13-0-45, Department of Mines, Central Registry File. Miners' Phthisis was eventually removed.

⁸¹ OMA, "Silicosis in Ontario," 6-7.

beyond the company gates. Many managers wanted to ensure that a miner who showed signs of excessive lung fibrosis avoided behaviour and contacts that could expose him to tuberculosis. This would involve closer supervision of the man's general health and living conditions. It was claimed that these paternalistic activities were desired for the protection of the miner, but it is just as likely that managers sought to reduce their compensation costs by accumulating evidence against the occupational origins of tuberculosis cases. It may have been easier to deny compensation for silico-tuberculosis if unsatisfactory living conditions could be raised as a possible source of the tuberculosis infection.⁸² Altruistic or calculated, such monitoring would have represented a gross interference by companies into the private lives of employees. Even the protective aspect of the proposal suggests the attitude that some managers may have held towards their workforce - a paternalistic spirit of reform that saw members of the working-class as ignorant and spendthrift plebians in need of moral and hygienic uplift, not better wages and working conditions.⁸³

The mining companies had plenty of opportunity to reiterate their message once the need to amend silicosis legislation had been established. Throughout the latter half of 1932 and the early part of 1933, numerous conferences were held between government and industry officials to discuss proposed amendments and to reach a consensus. It goes without saying that no representatives of the miners were included at these conferences.⁸⁴ Once again an issue of vital importance to the working-class was being resolved by government officials who were only prepared to introduce changes amenable to capital. The health of corporate balance sheets remained more important than the health of sick miners.

The original 1931 meeting between government and industry representatives set the tone for the amendments made in April 1933 to the silicosis provisions of the Mining Act and the Workmen's Compensation Act, as only Sinclair's proposals to make the medical

⁸² G C. Bateman, Secretary, OMA to Charles McCrea, Minister of Mines, 8 May 1933, AO RG13-13-0-46, Department of Mines, Central Registry Files.

⁸³ The American example of this is explored in Markowitz and Rosner, "'The Street of Walking Death'", 543; the British example of this phenomenon is explored in John M. Eyer, "The Sick Poor and the State: Arthur Newsholme on Poverty, Disease, and Responsibility," in *Framing Disease: Studies in Cultural History*, eds. Charles E. Rosenberg and Janet Golden (NewBrunswick, N.J.: Rutgers University Press, 1992), 278, 280-1, 290-2.

⁸⁴ Memorandum by T.F. Sutherland, Acting Deputy Minister of Mines, "Changes in the Mining Act and in the Workmen's Compensation Act, made at the last Session of the Legislature as Regards Silicosis," 21 April 1933, AO RG13-13-0-46, Department of Mines, Central Registry Files.

examination more thorough and to keep x-ray results confidential were acted on. The other revisions also catered to the demands of the operators. The definitions of silicosis, tuberculosis, and disability were altered, while the rate of payment and the time allotted to file a claim were also changed. In addition, the certificate of freedom from disease was revised.⁸⁵ In all of these amendments, government and mining officials were using the blurred links between silicosis and tuberculosis to reduce their obligations to provide compensation to sick miners. Similar efforts were made to obfuscate the workplace origins of illness in the United States and shift the blame to the living habits of miners.⁸⁶ Starting from a relatively progressive position, silicosis compensation in Ontario gradually moved closer to emulating that of its American cousins.

Silicosis was redefined as "a fibrotic condition of the lungs caused by the inhalation of silica dust sufficient to produce a lessened capacity for work." The inclusion of physical disability in the definition brought an end to compensating miners with the earliest stages of silicosis. Since silicosis as a medical condition was no longer compensable, silicotic miners and smeltermen were more likely to continue working in dusty occupations until they were ill enough to qualify for compensation. Unfortunately, it was alleged by union representatives that many of these men were relieved of their employment before they could qualify for compensation and blemish a firm's compensation record. In the worst instances of abuse, company doctors purportedly withheld from men the knowledge that they had the disease, reducing the odds of the men filing a compensation claim within the required time.⁸⁷ Tuberculosis was now defined as being present when the tubercle bacillus was found in a person's sputum, while active tuberculosis was considered to be present when it seriously impaired a person's capacity for work.⁸⁸ The redefinition of tuberculosis was designed to increase the number of men excluded from underground employment and to reduce the

⁸⁵ J.G. Cunningham, Director, Industrial Hygiene Branch, Department of Health to D.G. Sinclair, Chief Inspector of Mines, Department of Mines, 2 December 1933, AO RG13-21-0-27, Silicosis File.

⁸⁶ Markowitz and Rosner, "The Street of Walking Death," 543.

⁸⁷ IUMMSW "Real Facts About Silicosis in the Metal Mining Industry," Union News (November 1936): 8; Angus D. Campbell, "Trends in the Development of Silicosis in Ontario Miners and Aluminum as a Factor in Prevention." Paper presented to the Chairmen and Directors of the McIntyre Research Foundation, December 1961, AO F1352-3-0-10, OMA Papers, McIntyre Research Foundation.

⁸⁸ "History of Silicosis Legislation in Ontario." memo prepared for W.A. Gordon, Federal Minister of Labour by Ontario Department of Mines, 1933, AO RG13-21-0-27, Silicosis File.

number of men eligible for compensation. The generosity of compensation benefits was also reduced by the 1933 amendments. Section 113(9a) of the Workmen's Compensation Act now specified that when a workman was disabled with silicosis complicated by tuberculosis, he was only entitled to compensation for 50% of his annual wage, rather than the standard rate of 66 and 2/3 percent. This was particularly unfair considering that silicosis rarely became disabling unless tuberculosis was also present in the lungs.⁸⁹ The smaller pension for silico-tuberculosis also disregarded the fact that in either instance a miner was unable to work and his family still had to eat. While 66 and 2/3 percent of a miner's income in the 1930s was far from generous, expecting a man to survive on just 50 percent of his former wage was immoral.

It also became much harder to apply for compensation. A miner who left the industry now had to apply for compensation within two years of leaving his job, instead of five, in order to meet the eligibility requirements. The Workmen's Compensation Board retained the power to make exemptions in cases of uncomplicated silicosis (no tuberculosis) for which compensation appeared justified.⁹⁰ As a sympathetic Porcupine Advance noted, assessments for silicosis compensation "[bore] heavily" on the downtrodden mining corporations.⁹¹ Consequently, this last amendment was an unabashed attempt by mining companies to avoid paying compensation claims they were responsible for, as it was well-documented that signs of silicosis often took ten years or more to appear in Ontario hardrock miners. Perhaps as bad, the limit on filing a compensation claim may have encouraged miners to remain in unhealthy jobs in order to ensure that they would be eligible for compensation upon becoming too ill to work. Such an effect would have had the added benefit to the mining companies of reducing employee turn-over.

⁸⁹ Ibid; "Silicosis in Ontario Mines: Extract from the 34th Annual Report of the Mines Accident Prevention Association of Ontario, May 1965," 30, AO F1352-2-0-6, OMA Papers, Royal Commission on the Health and Safety of Workers in Mines.

⁹⁰ "History of Silicosis Legislation in Ontario," AO RG13-21-0-27, Silicosis File.

⁹¹ "Test New Method to Absorb Silica Dust," Porcupine Advance, 9 November 1933, p. 5. In Quebec, which had a law modelled on that of Ontario, silicosis compensation was so costly that the disease was removed from the list of compensable diseases. The reasoning behind this motive is curious, as it implies that a disease should only be compensable if it is not a serious problem. In la Belle Province profit levels for foreign investors were deemed more important than a miner's health and livelihood. This must have been the best policy because democratic governments only act on behalf of the public interest, not of a particular class.

In many instances, even men showing signs of silicosis who wished to continue working, at least until they were disabled enough to qualify for compensation, were not granted this privilege. Upon learning from the company doctor that a man had silicosis, the employer looked for an excuse to terminate the man's employment. This was frequently done through a lay off or by firing the man for laziness or carelessness. In such instances, it was the practice to keep both the miner and the government ignorant about the man's medical condition. This made it more difficult to find the employer responsible for the man's condition and thus reduced the employer's compensation costs.⁹²

Members of mining communities who were not consulted about the 1933 amendments to silicosis legislation were displeased with many of the amendments and informed the government of their own legislative proposals. The more restrictive measures to qualify and apply for compensation seem to have inspired the proposals submitted by the Timmins local of the Mine Workers' Union of Canada, which were characterized by a desire to keep miners regularly informed about the status of their health, both to avoid the development of disabling silicosis and to prevent companies from mistreating miners on account of health problems unknown to the affected individual. The proposals were an effort by miners to gain greater control over their health. For example, the union desired the examination of every underground worker by a medical officer of the Workmen's Compensation Board at least once a month and x-ray examinations were requested at least every three months. This would have kept miners informed of any decline in their health and given them the chance to leave underground employment prior to the development of silicosis, or warned those with silicosis against quitting their employment until they were eligible for compensation. To monitor the health of miners and to ensure that firings or other abuses of miners were not related to health problems, it was proposed that a medical registry of the health records of all employees be kept by each company, and that the registry be made available to any elected committee of mine workers. Perhaps to ensure that employees

⁹² IUMMSW, "Real Facts about Silicosis," 8. It must be remembered that the IUMMSW sought to portray mine operators in the worst possible light in order to attract miners to the union. For this reason, it is not clear how common this practice was, although, as this chapter shows, mine operators could be quite petty where compensation was concerned. The presence of such stories, true or not, is still significant because in industrial relations perception is as important as reality.

were not discharged on account of silicosis and to aid them in their search for new employment, it was deemed advisable upon leaving employment at any mine to have the health of a miner attested to on the individual's mining certificate by a Compensation Board doctor. In an unusual proposal, it was recommended that each worker exposed to silica dust be provided with at least a quart of milk each work day at employer expense. Apparently milk was believed to provide some protection against inhaled silica dust.⁹³

The members of the Timmins and Porcupine Law Association also proposed amending the silicosis compensation statutes. The lawyers' suggestions were inspired by the hardships faced by their clients on account of the new silicosis compensation laws. If adopted the resolutions would have essentially returned the laws to their pre-1933 status. A decrease in the number of men receiving compensation also likely reduced the fees being collected by the lawyers for helping to process successful claims. The Association's demands included the return of full compensation benefits for silico-tuberculosis, the elimination of the ambiguous need for employees to establish that they had been exposed to silica dust, and the end of pre-employment medical examinations conducted by employers after a new employee was already approved by a medical officer of the Compensation Board. The lawyers also wanted miners to have the right to appeal the decisions of the Compensation Board in court, one of the rights given up by workers in exchange for the no fault basis on which workers' compensation was granted.⁹⁴ This last proposal might have backfired had it been accepted, as the Compensation Board frequently gave applicants the benefit of the doubt when a medical diagnosis was indecisive, whereas a court required incontrovertible evidence. Still, the amended legislation often seemed to deal a harsh blow to the miner, as evidenced in a 1934 case, in which the Compensation Board denied silicosis benefits to a man who failed to file his claim within two years of leaving his job. Diagnosed as one hundred percent disabled by silicosis uncomplicated by tuberculosis, this miner was

⁹³ "Extract from Amendments to the Mining Act as Suggested by Mine Workers' Union of Canada, Timmins," [1933], AO RG13-13-0-47, Department of Mines, Central Registry Files.

⁹⁴ Resolutions of the Timmins and Porcupine Law Association, [1934], AO RG13-13-0-47, Department of Mines, Central Registry Files.

refused any reconsideration by the Board. Even the chief inspector of mines felt that justice had not been served.⁹⁵

One well publicized case involved the struggle of a former Inco miner, John Hakala, to obtain workers' compensation. Hakala, a native of Finland, started his mining career in 1923 and began to work for Inco at the Frood Mine in 1928. A year later he transferred to the Copper Cliff smelter. In 1934, he wanted to return underground, but an x-ray examination by Inco physician Dr. Morgan found his lungs unsuitable for mine work. The next day, Hakala was fired from his job at the smelter - a strange coincidence. Believing he had silicosis, Hakala tried unsuccessfully to obtain worker's compensation. In January 1935, he was finally granted a hearing before the Silicosis Referee Board. The Board determined that Hakala had pulmonary tuberculosis, but that "silicosis according to the Act was not present." Aware that tuberculosis often appeared in the wake of silicosis, Hakala went to see Dr. A.H. Caulfield of the Toronto General Hospital, who determined that his x-ray showed what was probably silicosis in the ante-primary stage. Hakala also was successful in winning a \$1000 payment from his insurance company for loss of health. Nevertheless, he was forced to go on relief in Sudbury. In July 1937, Dr. Caulfield re-examined Hakala and determined that he had early stage silicosis. This gave Hakala a renewed determination to continue his fight. He was apparently not unique in his misfortune. In September 1937, he organized a conference of silicosis patients from Inco in order to gather together their diverse stories and grievances for presentation to the provincial government, in the hope that a large number of complainants would get more action than individual cases.⁹⁶ Hakala was a victim of the new legislation because his silicosis was complicated with tuberculosis and because his capacity for work had not yet been diminished, though he was no longer permitted to work in mining.⁹⁷

⁹⁵ D.G. Sinclair, Chief Inspector of Mines to T.F. Sutherland, Acting Deputy Minister of Health, 4 July 1934, AO RG13-13-0-55, Department of Mines, Central Registry Files.

⁹⁶ IUMMSW, "John Hakala, INCO Silicotic Victim Says "I Will Fight for Compensation Until I Die," Union News (August 1937): 7; John Hakala, "Silicosis Victims Conference Called by Inco Silicotic," Union News (September 1937): 8.

⁹⁷ While Hakala may only have had tuberculosis, the fact that the Inco physician did not state why he was unhealthy seems suspicious. The need for a miner to possess a freedom from tuberculosis certificate ensured that a mining company was well within the law in denying someone with tuberculosis from working underground.

There existed numerous other instances of compensation costs that should have been borne by the mining companies being passed on to sick individuals and municipalities. Miners denied compensation benefits generally went onto relief. Those who received benefits found them entirely inadequate for all but the most basic standard of living. Instead of serving as a reward for service to the mining industry and the economic development of Canada, silicosis pensions seemed more like a punishment for choosing the wrong occupation. Dave Lavalee, a former employee of the Lake Shore Mine found himself in this position when he developed silicosis complicated by tuberculosis. While Lavalee was receiving care at a sanitarium in Gravenhurst, his wife and three children experienced great difficulty living on a pension of considerably less than 66 and 2/3 percent of Lavalee's former income.⁹⁸

More dramatic was the case of Steve Kostyneck, who had worked in mining for nineteen years, but who was denied any compensation because the Workmen's Compensation Board did not have enough evidence that he had worked the five years in Ontario necessary to qualify for silicosis compensation. Although Kostyneck came to Canada when he was fourteen and had passed all his x-ray examinations prior to 1934, the company doctor suggested he had developed the silicosis before immigrating. Kostyneck had a bottle containing over a dozen tiny stones expectorated from his lungs and numerous medical opinions stating that he had silicosis, but this did not deter the Compensation Board from denying that he had the disease, at least in a compensable form.⁹⁹

Management also tried to rid itself of high risk workers in a more open manner. In one week of January 1937, union organizers in Timmins received ten complaints from men to whom a company doctor recommended seeking alternative employment. These men all had at least six years of experience in the industry, which raised the suspicions of organizers that some plan was in place to remove employees representing a potential compensation case. The men involved, after receiving their annual x-ray, were advised by a company doctor that they should change employment while they were still healthy. The doctor even

⁹⁸ IUMMSW, "Compensation Law Causes Suffering," (December 1937): 6. The family likely received the 50 percent of former wages paid to ex-miners with silico-tuberculosis

⁹⁹ Ibid.

offered to write a letter of recommendation which he assured would be a ticket to a job “down east,” in the midst of the Depression. This plan was interpreted as an attempt to use miners only so long as they were in peak condition. It is suspected, in light of other corporate practices, that the miners advised to leave their jobs showed the warning signs that silicosis was developing. By removing them from the pay roll before the disease became noticeable, the two year limit on filing a compensation claim would pass before the men realized they had silicosis, particularly in a compensable form. The Union News, in a rhetorical flourish, warned that “such hay-wire and fly-by-night schemers are ghost babies of diabolical minds, and not for one minute will such a plan or similar plans be effectively implemented against the miners here or elsewhere.”¹⁰⁰ It seems somewhat contradictory that miners wanted both the right to early compensation to facilitate a change of occupation and the right to continue working in the face of a diagnosis of silicosis. This contradiction disappears if the right of an individual to decide whether or not he desires to continue working - instead of a company official or government policy - is treated as an aspect of the struggle over workplace control.

It was horror stories like those above that fuelled the fires of miner unionism in the 1930s. In 1936, the International Union of Mine, Mill, and Smelter Workers (IUMMSW or Mine Mill) began an organizing drive in northern Ontario. Sensing the discontent of miners with Ontario’s silicosis policies, which reflected the concerns of capital rather than of labour, Mine Mill made the demand for changes to the legislation central to its organizing drive. Among the first targets of the union’s campaign were the hated company doctors:

Medical silicosis means having the disease while able to work, and disability means you are not able to work as a result of the disease...who determines the cause of your disability? The company and compensation doctors. And it is a well-known fact to the miners that most of these doctors don’t hesitate to give tuberculosis, fallen arches or baby scars on your knees as “reasons” for disability; anything so long as it can be used to deprive you of the compensation.¹⁰¹

One proposal designed to counter the power of the company doctors was the extension of workmen’s compensation coverage to all diseases of the lungs. By linking the presence of

¹⁰⁰ IUMMSW, “Gold Miners Beware,” Union News (January 1937), 4.

¹⁰¹ *Ibid.*

bronchitis, pleurisy, and asthma to the weakened state of lungs exposed to silica dust, it would no longer be possible for doctors to deny men compensation by attributing their poor health to these diseases.¹⁰² When the Timmins and Kirkland Lake locals of Mine Mill each developed a list of their main demands in 1937, both lists asked that the miners be given the right to choose their own doctor, another attempt to gain some independence from what were perceived to be the arbitrary decisions of company doctors.¹⁰³

There seems to have been considerable resistance at Queen's Park to a bill regarding the right of miners to choose their own doctor. A Mine Mill sponsored bill imaginatively entitled "The Miners' Right to Choose Their Own Doctor" was lobbied for by South Porcupine M.P.P. John Rowlandson in the winter 1937 session of the provincial legislature. If passed, the bill would have given a miner the right to tell the company which doctor he wished his monthly health plan deduction to be paid to. At a meeting held at Schumacher in April 1937, Rowlandson reported on the great difficulties he encountered in winning consideration of his bill. The various departments with some responsibility for miners' health spent the session passing the bill on to other departments. Finally, the support of Attorney-General Roebuck and Minister of Labor Croll led to the endorsement of the bill by Mr. Faulkner, the Minister of Health, who gave a written promise to Rowlandson that the proposed legislation would be absorbed into the Health Act. According to the local member of the provincial legislature, the reason for the hot potato approach to the bill was intense opposition from private lobbyists and other outside sources who remained anonymous to the constituency meeting. Rowlandson advised the miners in the audience that they were not legally compelled to pay their money to a company doctor, as it was a vestige of an earlier health care arrangement between mining companies and their employees being fought by the union.¹⁰⁴ In the face of government obstinacy towards Rowlandson's bill, miners took the initiative to win the desired changes themselves. A month after Rowlandson's speech, it was reported that Hollinger employees had won changes to the company health plan that allowed

¹⁰² IUMMSW, "All Lung Diseases Must Be Covered by Compensation Act." Union News (July 1937): 6.

¹⁰³ IUMMSW, "Union Demands." Union News (August 1937): 5.

¹⁰⁴ IUMMSW, "Croll and Roebuck Favour Bill 'Miners' Right to Choose His Own Doctor' Says Rowlandson." Union News (April 1937): 7.

a man to decide which doctor would care for himself and his family.¹⁰⁵ Given the record of company doctors in denying compensable status to silicotic miners and in dismissing high risk workers, the desire of miners for the right to select their own doctor was likely motivated in large part by the controversies surrounding silicosis. By extension, the desire of mine workers to gain control over their health care should be seen as part of the ongoing struggle over workplace control.

Later in 1937, union representatives were granted a hearing with the Workmen's Compensation Board in order to present the accumulated grievances of northern Ontario miners. These grievances were directed against the mining companies and the Compensation Board. The main source of grievances derived from the denial of compensation to miners with silicosis because they failed to file their claim within two years of leaving their employment. Another complaint involved the Board's practice of placing the burden of evidence on men seeking to demonstrate that they had a greater disability than they were receiving compensation for. It seemed a mean-spirited way of treating sick men.¹⁰⁶ This followed the familiar pattern of shifting the costs of silicosis onto the miners. Given the opportunity to express their grievances, the miners responded with demands for changes to the legislation.

Mine workers were not the only ones seeking changes to silicosis legislation. Chief inspector of mines D.G. Sinclair declared in 1937 that the silicosis policies of Ontario were failing those with the disease. He admitted that the need for a miner to file a claim for silicosis compensation within two years of leaving a job had resulted in the rejection of numerous legitimate claims from men disabled by the disease: "While the necessity of some limitation is recognized it is felt that the stipulated two-year term is too short to cover the real necessities of the situation in this respect."¹⁰⁷ Sinclair recommended a five year limit be restored for the filing of a claim. He also proposed that the benefit restrictions be eased for men showing signs of tuberculosis along with their silicosis: "Without restriction of some

¹⁰⁵ IUMMSW, "Right to Choose Own Doctor Won by Hollinger Men." Union News (May 1937): 3.

¹⁰⁶ IUMMSW, "Miners' Union Delegates Interview Compensation Board with Proposals." Union News (June 1937): 4.

¹⁰⁷ Memorandum re. Silicosis Legislation," from D.G. Sinclair, Chief Inspector of Mines, 24 February 1937. AO RG13-21-0-29, Silicosis File.

nature it must be admitted that the industry would be placed in the position of providing what essentially amounts to absolute insurance against tuberculosis to all workmen and ex-workmen. On the other hand, lung damage suffered by workers while in employment definitely predisposes the subject to tuberculosis...If determinable, cases in this category are rightly chargeable to the industry and should be provided for."¹⁰⁸

The chief inspector also attacked the continuing collusion between medical officers and employers in which employers were informed about the physical condition of individual miners. Using this information, men showing preliminary signs of impairment on account of dust exposure were fired. Because of their condition, it was impossible for these men to pass a medical examination to obtain employment at another mine. The two year limitation on filing a compensation claim delivered an extra blow by rendering these men ineligible for compensation when their income-earning capacity was reduced. In the opinion of Sinclair, "this course of action is fundamentally wrong and tends to defeat the basic purpose of the legislation providing for the protection of workmen whose occupation has undermined their health through dust exposure."¹⁰⁹

The chief inspector's sudden sympathy may be attributed to two factors. It had become obvious to many observers that sick men were denied compensation, which seemed "fundamentally" wrong. It was also well-known that men with silicosis who did not receive compensation were often forced to go on relief to support themselves and their families.¹¹⁰ In the economic climate of the Great Depression, it can be assumed that the government and the public would have resented the need to support sick men who mining corporations should have been supporting.¹¹¹

In the United States, the Depression served as a catalyst for the implementation of worker's compensation for silicosis after sick miners unable to obtain other employment sued for compensation to support themselves and their families. A rise in the number of successful liability suits led mining executives to join miner's unions in calling for a system

¹⁰⁸ Ibid.

¹⁰⁹ Ibid.

¹¹⁰ IUMMSW, "Cases of Silicosis Investigated in Timmins - Mayor Bartleman Flays Gold Companies," Union News (May 1936): 4; "John Hakala, INCO Silicotic Victim Says 'I Will Fight for Compensation Until I Die,'" Union News (August 1937): 7; "Compensation Law Causes Suffering," Union News (December 1937): 6.

¹¹¹ IUMMSW, "Compensation Act Must be Changed to Cover Victims," Union News (December 1938): 12.

that would control compensation costs.¹¹² In Ontario, where worker's compensation already covered silicosis, limited finances may have caused government officials to consider closing the loopholes that allowed mining corporations to shirk their responsibilities to sick workers by forcing the men onto public relief.

Labour did not content itself with the chief inspector of mines' sudden discovery of working-class grievances. It continued to pressure the government to amend its silicosis legislation. George Anderson, an organizer for the IUMMSW, was part of a committee from the Trades and Labor Congress of Canada which presented a memorandum to the Ontario cabinet early in 1937 asking for changes to the Workmen's Compensation Act. The position of the Congress backed the demands of Mine Mill which, owing to the high-risk occupations of its membership, was a leader in fighting for the recognition and compensation of industrial disease.¹¹³

In 1939, the Kirkland Lake local of Mine Mill sent three resolutions to Paul Leduc, Ontario's minister of mines. One of the resolutions repeated the long-standing union demand for the revocation of the rule requiring a specified amount of work experience in Ontario mines before becoming eligible to receive compensation. As usual, this requirement was criticized for its discrimination against miners who changed their province of residence and for absolving operators and the Compensation Board of responsibility for many miners with silicosis, whether contracted in Ontario or elsewhere. The resolution asked that compensation be granted to any miner in Ontario with silicosis, with no restrictions on eligibility. Another resolution demanded full compensation for silicosis when tuberculosis was present, as the linkage of tuberculosis with silicosis was being used to deny compensation to many miners showing evidence of silicosis.¹¹⁴

The main resolution of the Kirkland Lake union concerned the definition of the eight hour day. The resolution linked hours of labour to both workplace control and health. The miners sought to tighten the definition of the eight hour day to mean eight hours from entry into the mine to exit from the mine. This stipulation was desired to counter employer efforts

¹¹² Markowitz and Rosner, "The Illusion of Medical Certainty," 187-8, 198.

¹¹³ IUMMSW, "Amendments to Compensation Act Important to Miners," *Union News* (March 1937): 3.

¹¹⁴ M.J. Mokey, Secretary, Kirkland Lake Mine and Mill Workers' Union to Paul Leduc, Minister of Mines, 7 March 1939, AO RG13-21-0-24, Silicosis File.

to set production quotas that could not be met in eight hours and which therefore required miners to work longer in order to fulfill the terms of their contracts. It was argued that the extra time spent in the underground environment was damaging to the health of the men.¹¹⁵ By linking the issues of hours and health, the miners hoped to reduce the power of management to determine the length of the working day.¹¹⁶

The Trades and Labor Congress memorandum, combined with the concerns of Mine Mill members and the chief inspector of mines, led Attorney-General Arthur Roebuck to introduce a number of amendments to the Compensation Act. Bill 78, introduced in 1939, gave the Compensation board the right to choose a medical referee in cases of dispute. This amendment dealt with the touchy situation of medical bias. The labour delegates proposed that in cases of disagreement about the physical condition of the worker, the contested claim be referred to a three person medical panel, consisting of a doctor appointed by the workman or by someone on his behalf, a doctor chosen by the company, and a doctor selected by the first two appointees. Where no agreement was reached after two weeks, the Compensation Board would appoint a third member. Another amendment extended the time to apply for compensation from two to three years. This was a compromise from the five years asked for by the Trades and Labor Congress representatives and D.G. Sinclair.¹¹⁷

Apart from these amendments, labour's lobbying was of little avail, as the revisions to the Mining Act were designed to soothe the concerns of mine operators about escalating silicosis compensation acts. The pre-employment x-ray screening programme, designed to weed out mining applicants at risk of developing silicosis, was strengthened. Under Section 155(c) of the Act, when a new miner passed his x-ray examination, he was now granted an "Initial Certificate," which enabled him to work at least an eleven month probationary period. At the end of this period, he was reexamined to evaluate his body's reaction to dust exposure. If no negative changes in his health were noticed, he was then awarded his

¹¹⁵ Ibid.

¹¹⁶ Although it is not clear to the modern observer what difference it made whether one spent eight hours or nine hours exposed to dust, this was a commonly used argument by miners to bolster their case for shorter hours. The main benefit would seem to come from reduced fatigue at the end of a shift.

¹¹⁷ IUMMSW, "Amendments to Compensation Act Important to Miners," Union News (March 1937): 3.

miner's certificate. This approach continued to focus on the health of the individual, rather than on the health of the working environment.¹¹⁸

Controlling Silicosis

Silicosis legislation was not just concerned with compensating silicosis victims. It was also interested in the prevention of the disease. The Mining Act of Ontario attempted to reduce the incidence of silicosis by requiring dust control in mines. The most effective way of controlling dust was thought to be water spraying. Mining companies were required to keep all mines, stopes, raises, and drifts wet. From 1924, the use of wet drills was compulsory. The law also required that miners be exposed to dust and fumes from blasting for as short a time in the shift as possible. Blasting was usually done at the end of the second shift, after which the mine was usually idle until the following day. A more recent innovation was the dispersal of a small amount of water via the air lines after blasting. The air lines blew out dangerous fumes and the water helped settle the dust.¹¹⁹ However, the Department of Mines' legislative record was not as impressive as it appears. In many instances the legislation codified standard mining practice. This was the case for wet-drilling, which most mine managers began to use in 1921 and 1922 after the identification of silicosis in northern Ontario mines.¹²⁰ There is also evidence that much of the initiative for health and safety regulations in the mines came from the Department of Health, as had the initiative for the compensation of silicosis. In January 1926, J. Cunningham from the Division of Industrial Hygiene recommended to his deputy minister "that some scheme for the prevention of silicosis...be instituted as soon as the matter has received thorough consideration by the parties concerned."¹²¹

¹¹⁸ Memorandum from D.G. Sinclair, Assistant Deputy Minister, Department of Mines to Robert Laurier, Minister of Mines, January 1941, AO RG13-21-0-5, Department of Mines, Silicosis File.

¹¹⁹ Cunningham, "Silicosis in Canada," 328-9.

¹²⁰ Letter to R.R. Rose, Kingdon Mining, Smelting and Manufacturing Company from T.F. Sutherland, Chief Inspector of Mines for Ontario, 21 May 1926, AO RG13-21-0-22, Silicosis File.

¹²¹ Memorandum to Dr. Bell, Deputy Minister of Health from J. Cunningham, Director, Division of Industrial Hygiene, 19 January 1926.

Apparently officials in the Department of Mines considered legislating the use of wet drills in 1921, but in cooperation with the mine operators, opted for a policy of voluntary adoption. This was because both parties felt it would be unwise to open the Mining Act for amendment while the Farmer-Labour government was in power.¹²² The failure of the Department of Mines to consult miners on silicosis legislation is understandable in light of the revelation that departmental officials placed their duty to the mining industry above their duty to the elected representatives of the people of Ontario.

Apart from wet-drilling, the only other major dust control measure to be legislated prior to the 1940s was the implementation of medical examinations to determine a man's suitability for mining work. This legislation has already been discussed for its role in controlling compensation costs, but it should be reiterated that medical examinations reduced working-class employment opportunities and deprived many miners of their source of income. It was cheaper for the mine operators to restrict who could work for them than to improve the working environment of the mines.

Inspection reports also noted the voluntary mining methods adopted by operators. In his dust survey for McIntyre Porcupine Mills, S.A. Wookey praised the use of water spraying in all stages of mining and the presence of auxiliary ventilation. However, he also noted that dust ventilation remained poor in numerous working areas and that a systematic ventilation system was still in the preliminary stages. The installation of a better system of ventilation was encouraged, as it was felt that water was already being used to its maximum potential.¹²³ Wookey found it necessary to recommend the end of blasting during shifts, except when absolutely necessary, because it exposed the workforce to large quantities of dust and gas. The inspector also recommended that all miners engaged in shaft development be provided with respirators for use after blasting and while reblasting. It was felt the use of these respirators should be mandatory.¹²⁴ Having requested a dust survey, it can be assumed that

¹²² Memorandum on the report of Dr. J. Michael Smith, AO RG13-21-0-45, Silicosis File.

¹²³ "Dust Survey of Underground Workings, McIntyre Porcupine Mines Ltd.," by S. A. Wookey, Inspector, Mines Inspection Branch, 28 January 1927, AO RG13-210-22, Silicosis File.

¹²⁴ "Preliminary Report of Dust Survey," by S. A. Wookey, Inspector, Mines Inspection Branch, November 1926, AO RG13-21-0-12, Silicosis File.

McIntyre was one of the more responsible employers, yet even its operations displayed many unhealthy practices.

Other dust control measures were available, but not mandatory. One method favoured by J.G. Cunningham, the director of the Division of Industrial Hygiene for the Department of Health in the 1930s, was the suitable location and design of ore passes. A properly designed hoisting shaft permitted dust to rise and leave the mine rather than remaining in the underground air. Another voluntary improvement, which many managers were reluctant to implement because of the cost, was an upgraded ventilation system. Auxiliary fans that delivered fresh air through canvas or metal tubing to active mining faces were widely used, but many mines simply installed huge fans in shafts that could not be operated in winter because they drew cold air into the mine. This meant most ventilation systems only functioned during the summer.¹²⁵

However, the Department of Mines was not completely ineffective. The silicosis examination conducted by the Department of Health discovered several cases of silicosis and a high silica content in the Porcupine Mine of the Kingdon Mining, Smelting, and Manufacturing Company. It was noted that Kingdon was still using dry stoping drills and was poorly ventilated. T.F. Sutherland, the chief inspector of mines, responded with a letter advising the firm to cease using dry stoping drills and to improve the ventilation of the mine. An official with the company responded that the advice was being heeded.¹²⁶

Inspector Evan Mill's report on the Dome Mine recorded a litany of silica sins. Wet drilling and surface spraying must have been in use, as no recommendations were made for their implementation. Despite this, Mill recorded high dust counts generated by drilling, blasting, and processing activities. To lower the dust counts, he recommended additional air lines to blow the dust away from drilling operations and that no machine operator or helper work more than eight hours a day or forty-eight hours per week. Where blasting was undertaken, Mill recommended that the men wear respirators with two filter papers and that the intensity of spraying be increased. He also suggested that men employed in sampling,

¹²⁵ Cunningham, "Silicosis in Canada," 328-9.

¹²⁶ Letter to R.R. Rose, Kingdon Mining, Smelting and Manufacturing Company from T.F. Sutherland, letter to T.F. Sutherland, Chief Inspector of Mines from R.R. Rose, Kingdon Mining, Smelting and Manufacturing Company, 26 May 1926, AO RG13-21-0-22, Silicosis File.

crushing, and pulverizing ore on the surface not be employed in that capacity for more than one year. A final recommendation involved the location of ventilation exhausts.¹²⁷

Poor ventilation is a recurring theme in mine inspection reports. This is probably due to the high cost of ventilation and the inability of the operators to pass the burden for ventilation costs onto the miners. Operators preferred to support dust abatement measures that shifted costs and inconveniences onto the labour force. The passage of time increased the need for ventilation. This was because as a mine expanded its depth and breadth underground, the need for artificial ventilation became greater. In South Africa, many mines had special shafts intended solely for ventilation, and where required, natural ventilation was supplemented by fans, the rearrangement of the mine into ventilation districts, and the splitting of air currents.¹²⁸ Revamping the ventilation system of a mine thus required considerable engineering expertise and expense.

A 1932 article from the Engineering and Mining Journal, reprinted in the Porcupine Advance, also emphasized the need for ventilation that removed dust from the work environment or diluted concentration levels. It noted that the effectiveness of ventilation masks was impaired because their discomfort prevented workers from wearing them regularly. In addition, the authors reported that spraying the working area with water was not entirely effective in removing dust particles. The principle behind a proposed dust hood was that since dust produced by drills was local, the dust removal system should also be local. It was argued that existing dust hoods were ineffective because of faulty design, insufficient air flow, and improper dust collecting equipment. Apparently, the Kelly dust trap eliminated these shortcomings.¹²⁹ However, such relatively affordable methods of dust control through ventilation only controlled dust generated by the drilling process. They did nothing to control the dust generated by mucking and shovelling, blasting, and tunnelling. By controlling dust at individual sources, such ventilation measures left the miner exposed to dust hazards

¹²⁷ "Report on Dust Conditions in the Dome Mill, 1927" by Evan Mill, Inspector, Mines Inspection Branch, AO RG13-21-0-11, Silicosis File.

¹²⁸ "The Estimation of Dust in Mine Air and the Steps Taken to Prevent Miners' Phthisis," J. Boyd for T.F. Sutherland, Chief Inspector of Mines, 1 December 1924, AO RG13-21-0-12, Silicosis File.

¹²⁹ "Dust Catchers Used to Fight Silicosis," Porcupine Advance, 25 August 1932, n.p. The excerpted article by Theodore Hatch, J. William Fehnel, and George S. Ketley was entitled "Combatting the Silicosis Hazard in Rock Drilling." It appeared in the August 1932 edition of the Engineering and Mining Journal.

generated by his co-workers elsewhere in the mine. In other words, dust production was local, but the dust hazard was not. Miners, who spent their days in dusty mines, seem to have been more aware of this than engineers, if their collective demands for better ventilation systems are any indication.

More promising was an experimental method of dust control developed at the Banting Institute by Dr. Dudley A. Irwin, Dr. W. Rounding Franks, and Dr. E.G. King under the supervision of the noted Dr. Frederick G. Banting. This method removed dust from the air by somehow giving an electrical charge to the offending particles, causing them to cluster together. The laboratory experiments were about to be tried in a working mine.¹³⁰ As the electrical dust precipitation method was never adopted, it is safe to assume that it was not effective in practice.

Not all the mining companies were equally cooperative in efforts to control silicosis. At the 1926 annual meeting of the Ontario Mining Association, some of the Kirkland Lake operators questioned the qualifications of the Department of Health doctors conducting surveys on the incidence of silicosis. These operators sought corroboration of the findings from outside silicosis experts. As a result, Kirkland Lake and Porcupine were visited in October 1926 by Dr. Sayers, chief surgeon of the United States Public Health Service and D. Harrington, chief engineer of the United States Bureau of Mines' Safety Service. Harrington stated that the mines of Porcupine had taken more comprehensive preventative measures than any mining camp south of the border.¹³¹ The intransigence of the Kirkland Lake operators indicates that the cooperative policy of the Department of Mines was a failure and that legislation was necessary to protect the health of Ontario's hardrock miners.

The inadequacy of existing legislation to control dust in the mines was becoming evident by the 1930s. More dust surveys were conducted in the Dome and Hollinger mines at Porcupine in 1932. A mining inspector participating in the survey wrote to the chief inspector of mines that dust levels had risen since previous inspections and that the time had come to mandate better ventilation.¹³² In addition, the number of miners with silicosis

¹³⁰ "Test New Method to Absorb Silica Dust," *Porcupine Advance*, 9 November 1933, 5.

¹³¹ Memorandum on the report of Dr. J. Michael Smith, AO RG13-21-0-45, Silicosis File.

¹³² Ralph [?], Inspector of Mines to D.G. Sinclair, Chief Inspector of Mines, 15 February 1932, AO RG13-21-0-17, Silicosis File.

continued to climb. From 1926 to 1936, 628 cases of silicosis were reported to the Department of Mines.¹³³ The voluntary approach to silicosis prevention was clearly a failure, but nothing was done to strengthen the Mining Act.

As proof of the failure of industry self-regulation, it was not until 1938 that the rising death toll finally forced Hollinger to concede the need for better ventilation. Prior to this, the company had relied on the movement of cages, skips, and intermittent running to stimulate airflow. One fan, designed to ventilate up to 1 000 feet underground, had been inadequate for the past fifteen years when that depth was surpassed. Mine Mill complained that better ventilation was provided for the black mineworkers of South Africa. In addition, blasting of the main ore and waste passes was constant while the mine was working, in contradiction of the best silicosis control policy which restricted blasting to the end of a shift. Demonstrating the technical skills possessed by miners and proving that health and safety need not be left in the hands of engineers, the union suggested that the passes be scaled more frequently and the bad corners cut off, in order to reduce the need for blasting and the attendant costs.¹³⁴

Apart from their opposition to the restrictions placed on who was eligible to work in mining, there is little evidence about the sentiments of miners towards the various methods of controlling silicosis, especially prior to the 1930s. However, by piecing together the evidence from Ontario and comparing it with the American experience, it is possible to arrive at some credible hypotheses. It is likely that the miners opposed many of the new regulations and practices for making their jobs more difficult and for infringing on their occupational independence. Historians in both Canada and the United States have documented a tradition of independence among miners that continued into the twentieth century despite the mechanization of their trade. Bob Miner claimed that in the 1930s, he only saw the shift boss for about five minutes a shift. Perhaps the most symbolic representation of miners' independence came in the designation of miners as "contractors,"

¹³³ "Memorandum for Mr. Tremblay, re. Silicosis Examinations", 27 October 1936, AO RG13-21-0-46, Silicosis File.

¹³⁴ IUMMSW, "Hollinger Decides After Twenty Years to Install a Ventilation System," (June 1938): 4.

even though they were actually employed by the mining companies.¹³⁵ As late as 1926, Inspector Wookey referred to miners in this way.¹³⁶

Wookey recommended the mandatory use of respirators by contractors engaged in mine development. It cannot be doubted that the respirators reduced the amount of dust breathed by a miner.¹³⁷ But they were also likely awkward and hot. In the stagnant air of a mine, the lenses were probably prone to fogging. Such a contraption would have not only been uncomfortable, but it would have slowed the pace at which a miner could work. When miners were employed on a piece rate system, a slower work pace would have reduced a man's income. In addition, a slower pace of work would have made it difficult to meet production quotas on time, resulting in a longer shift or disciplinary action from the shift boss. As production bonuses composed a large portion of every miners' income, a slower pace of work reduced the size of the much needed bonus.¹³⁸

The practice of placing much of the responsibility for dust control on the individual worker can be seen as an extension of the long-standing management tradition of blaming accidents on worker carelessness and the inherent risk of mining. The report of a mine inspector provides evidence of the degree to which this tradition was extended to dust abatement. After discussing the various dust control measures implemented in the McIntyre mines, Wookey noted that "the personal factor is also of considerable importance. A good deal depends upon the care with which a runner operates his machine and the state of repair in which he keeps it."¹³⁹ Of course, maintenance time reduced productivity. The ideology of individual responsibility ignored the fact that a miner using dust control measures properly was still at risk from the dust created by a careless coworker elsewhere in the mine. There were two solutions to this - improved ventilation or increased workplace supervision.

If management placed much of the burden for silicosis prevention with the mine workforce, a new activism also permeated the ranks of the mine supervisors. Management now made an effort to enforce health and safety regulations on miners. This activism may

¹³⁵ Miner, *Miner's Life*, 4; Aldrich, *Safety First*, 47-48.

¹³⁶ "Preliminary Report of Dust Survey," AO RG13-21-0-12, Silicosis File.

¹³⁷ Wookey noted test results showing one filter thickness on the Wilson Dustite Respirator No. 2 eliminated 80 percent of dust particles and that with a two filter thickness, 96 percent of dust particles were eliminated.

¹³⁸ Miner, *Miner's Life*, 4.

¹³⁹ "Dust Survey of Underground Workings, McIntyre Porcupine Mines Ltd.," AO RG13-210-22, Silicosis File.

have been inspired by the Safety First movement, the desire to keep compensation costs to a minimum, or the wish to assert greater managerial control underground.¹⁴⁰ Whatever its cause, increased supervision appears to have been more odious to miners than the new safety measures.

This attitude was reflected in the rhetoric and policies of the IUMMSW. In addition to pushing for more generous compensation, the union attacked corporate and government inaction on the working conditions of Ontario mines and demanded a greater voice for labour in the prevention of silicosis. Members of the union dismissed management health and safety initiatives as an excuse to increase the supervision of the work process. Herman Mutz, the superintendent of the INCO mines, boasted in 1936 that the Froid mine had one boss for every ten men to “look after the safety of the men... We are in a position where the working men must be forced to follow such methods of work that will eliminate the danger of them being injured.”¹⁴¹ In response to Mutz’s assertion, it was noted that the production of nickel increased 42 percent, while employment only increased by 36 percent, indicating that each man performed more work. The faster pace of work was directly linked to increased supervision: “Bosses in the mines and smelters are for one purpose, to make sure that certain and a big amount of ore and nickel is taken out.”¹⁴²

Although the above example refers to safety issues, the same contest of wills likely occurred over the enforcement of health protection measures. On the pretext of ensuring that spraying was properly utilized or that respirators were worn, it would have been possible to increase the number of underground supervisors, who could easily enforce a faster pace of work when not busy investigating health and safety practices.

Increased supervision was not the only way in which the mining companies were attempting to augment worker output. From at least the 1930s on, the production bonus system has been utilized in Ontario metal mines. Under this system, employees received a bonus for any production above regular quotas. The promise of an increased pay packet encouraged the mine labour force to work faster, at the expense of their health and safety. A

¹⁴⁰ The increased supervision implemented by the Safety First movement is documented in Aldrich, Safety First, 248-9.

¹⁴¹ IUMMSW. “One Boss to Every Ten Workers - To Enforce Speed-up,” Union News (September 1936). 3.

¹⁴² *Ibid.*

faster pace of work involved more drilling, blasting, and shovelling, which generated more dust in a shift. It also left individuals more fatigued and prone to illness. Fatigue and a quickened pace of work under the bonus system were also thought to be the cause of numerous accidents. The union claimed that, in any event, mining companies ignored their own health and safety rules because these made it impossible to maintain existing production levels. Instead the bonus system was used to enforce increased production levels, while violations of health and safety regulations were used as a pretext to fire obstinate employees.¹⁴³

When increased supervision was combined with the presence of new rules for dust abatement, miners may have felt that their traditional autonomy was being undermined. In this light, it is not surprising that the health and safety proposals put forward by the miners and their union were part of an effort to assert some control over the working environment. For example, to enforce health and safety without increasing the intensity of underground supervision, the union called for the formation of health and safety committees composed of miners, with the power to investigate unsafe workplaces and demand changes before the resumption of work.¹⁴⁴ This proposal recognized the occupational expertise and experience of miners and showed a distrust of the engineering and medical experts employed by the companies.

In the absence of a cure for silicosis, the union considered the prevention of silicosis to be of great importance. To this end, it was argued that all known methods of controlling dust should be utilized. For a disease caused by dust, the most obvious solution was the removal of dust from the work environment. To achieve this, miners asked for better ventilation. Miners also protested the rapid resumption of work after blasting. It was stated that timbermen were often ordered back to work while only able to see a few feet through the dust. To ensure that a mine was safe to work in, the union asked operators to purchase scientific devices capable of measuring the level of dust present in the air. This equipment was not cheap and in the opinion of G.C. Bateman, secretary of the Ontario Mining

¹⁴³ IUMMSW, "Union is Needed in Kirkland Lake," Union News (December 1936): 1; IUMMSW, "Death Rate Increases as Dividends Soar," Union News (June 1937): 6.

¹⁴⁴ *Ibid.*; IUMMSW, "Three Miners Killed in Lakeshore Fall," Union News (September 1936): 3.

Association, the expense was not worthwhile. It was also felt that new methods of prevention could be developed through the creation of a commission bringing together leading silicosis researchers and miners.¹⁴⁵ This last proposal again indicates that Ontario's hardrock miners were not going to defer to the wisdom of scientific and management experts in the development and implementation of dust prevention techniques. While management and government emphasized the regulation of who was permitted to work, the miners focused on creating the healthiest possible work environment.

Ontario was the first jurisdiction in North America to enact legislation to compensate the victims of silicosis and the first in Canada to require dust reduction to control the incidence of the disease. For this reason, government and corporate officials deserve some praise. However, it must be remembered that occupational agendas influenced much of the legislation, not altruism. At the centre of the debate was the refusal of mining corporations to accept industrial disease as a by-product of hardrock mining and as a cost of production. As a result, the good intentions of the initial legislation quickly degenerated into a cynical attempt by mine operators, with government cooperation, to pass the costs and responsibilities of the silicosis legislation onto the working-class. The miners responded by demanding a role in the shaping of Ontario's silicosis policy. Because of this conflict, the debate surrounding silicosis lost its focus on how to best alleviate and prevent suffering and came to revolve around the issue of workplace control. Between 1921 and 1939, the miners were losing this battle in an ongoing class war.

¹⁴⁵ IUMMSW, "Real Facts about Silicosis," 8; A Froud Miner, "Ventilation a Necessity in All Mines, Mills, and Smelters." Union News (July 1937): 6; IUMMSW, "Canadian Doctors Experiment for Prevention of Silicosis." Union News (June 1937): 6.

Chapter Three: Silicosis in the Home and the Community, 1921-1939

It has been shown that silicosis became intertwined with the struggle between labour and management for control of the workplace. However, for those afflicted with silicosis, the controversy surrounding the disease could not be left at the mine at shift's end. It is for this reason that the relative importance of the disease can be assessed by exploring the role it played in the life of mining communities. From an examination of readily available sources, it can be tentatively stated that in the 1920s and 1930s, silicosis was a general concern among the population of mining communities, although as in the workplace, its degree of prominence varied with one's standing in the community.

As a mining community, anything relating to the industry was news in Timmins. For this reason, silicosis could not be ignored, even by the intensely conservative Porcupine Advance. Like many small town papers, past and present, the Advance, published weekly by George Lake, suffered from excessive boosterism. Any criticism of Timmins by a southern personality or newspaper warranted weeks of editorial rebuttals. The money-making successes of the local mining companies were trumpeted in front page headlines and the efforts of the Chamber of Commerce were constantly applauded. In the 1930s, frequent warnings were given about the dangerous Bolshevik leanings of the recently founded Cooperative Commonwealth Federation. This was clearly not a newspaper that was going to give undue negative publicity to mining corporations and the capitalist system under which they thrived; nor was it going to go out of its way to bolster the claims of union organizers.

Still, a newspaper dependent upon mine and mill workers for its circulation could not ignore working conditions in the mines. Reports of mining accidents were carried, although blame was rarely assigned. Similarly, developments in the control of silicosis were carried that were of interest to the Advance's readership. The composition of these articles is interesting, as they reflect the official positions of the mine operators and the Department of Mines - silicosis was a concern in Ontario mines, but commendable efforts were being made to reduce the risk of the workforce exposed to the disease:

On the one hand the progress made should be remembered and noted. It is not so many years ago that there was no thought of compensation for cases of

this kind. On the other hand, while great progress has been made, there is always room for further advance. The Ontario Government is certainly to be commended for the progress made in dealing with silicosis...The mines have shown a very ready disposition to do all possible to assist the Government in dealing with the silicosis problem. The Government has also gone, perhaps, as far as practical for the moment, but nothing is to be lost and much may be achieved by friendly consideration...¹

When silicosis was first noted as a problem in the gold mines of northern Ontario, the Advance downplayed this blemish on the otherwise untarnished beauty of northern development. The first reference to silicosis in the weekly was less than an exposé of underground conditions. It was a report on a speech given locally by T.F. Sutherland, the Chief Inspector of Mines, regarding his recent visit to South Africa, which was primarily to investigate that country's silicosis policies. Reporting on Sutherland's presentation, the Advance wrote: "After an explanation of the methods adopted to cut down the danger of silicosis (miners' consumption), a lung disease due to breathing fine silica, the speaker went on to give a description of the country travelled from Cape Town to Elizabethville in the Belgian Congo..."² Dr. Sutherland, I presume?

Later in 1926, it appears that concern about silicosis was growing quickly in Timmins, as witnessed in a speech of "closest interest" made by silicosis expert Dr. Haig to the local Kiwanis club solely on the subject of the disease. There was now a "fight against the spread of silicosis." The emerging silicosis policy of the Ontario government was supported by the doctor, including periodic examinations of underground workers, the transfer of silicotic workers to less dusty tasks, and the compensation of early silicotics in order that they might seek other employment. The obligatory praise of the cooperative actions of the mining companies was included. Most interesting was Dr. Haig's effort to calm fears about the extent of silicosis among mine workers. Apparently, "wild stories" were rampant about the number of men touched by this industrial disease.³ This last fact provides convincing evidence that miners were aware of the silicosis risk and very concerned about it, to the point that the whole community was knee-deep in rumours.

¹ "Miner's Union Takes Up Matter of Silicosis Compensation," Porcupine Advance, 31 March 1927, n.p.

² "Interesting Address Here on Mining in South Africa," Porcupine Advance, 4 March 1926, Section 2, l.

³ "Earnest Work in Combatting the Spread of Silicosis," Porcupine Advance, 15 July 1926, 9.

A speech by Conservative Premier G. Howard Ferguson also demonstrated that voter concerns about silicosis mingled with the desire for continued northern development. The speech, outlining government expenditures and policies towards the north contained a promise from the premier that the Ontario government would continue to find a real solution to the silicosis problem.⁴ The disease was enough of a concern in northern mining communities that the leading politician in the province could not ignore it.

However, both the Advance and the Ontario Mining Association were happy to downplay the silicosis risk in the wake of the Dr. Smith's report. The newspaper reported on a meeting of the OMA in which it was noted that Smith found very little silicosis in silver and nickel mines, and that the disease was far less prevalent in Ontario mines than originally feared. It was hoped that this would put an end to the mental anguish of miners and their families, who feared losing their livelihood.⁵

Despite the apparently minimal risk of contracting silicosis, the Advance continued to keep its readership informed of developments in silicosis policy and research. These included the 1928 amendments to the Mining Act and the Workmen's Compensation Act and an article on dust catchers.⁶ The 1932 article on dust catchers informed readers about a new experimental method of reducing dust generated by drills. The piece reflected the increasing frequency of silicosis in Ontario gold mines, referring to the disease as "one of the terrors of the miner." The writer advised that "readers of the Advance are interested in silicosis. Some of them have sad reason to be interested. Others have necessity to study anything and everything in regard to silicosis with the view of avoiding danger." The controversial nature of silicosis legislation was also apparent in the article, which noted that:

mines in the North and particularly in the Porcupine have spent money generously attempting to combat silicosis. The Ontario government has given leadership in the matter. There are some that even consider that too much prominence has been given to silicosis which is not nearly as great a menace in this country as in some others. The fact remains, however, that silicosis is a danger that miners have to face and anything done to prevent it or to minimize its effects is most desirable.⁷

⁴ "Premier of Ontario Reviews Progress of the Northland," Porcupine Advance, 16 September 1926, n.p.

⁵ "Harry Oakes President of Mining Association," Porcupine Advance, 21 July 1927, n.p.

⁶ "Province to Compensate Sufferers from Silicosis," Porcupine Advance, 29 March 1928, Section 3, 1

⁷ "Dust Catchers Used to Fight Silicosis," Porcupine Advance, 25 August 1932, n.p.

G.C. Bateman, the secretary of the Ontario Mining Association, also downplayed the silicosis problem, complaining that “much misleading information has been given regarding silicosis.” He added that only one percent of miners ever developed the disease. Bateman also pointed out that numerous men known to have silicosis continued to work for years after their initial diagnosis with little evidence of disease progression or decreased work ability. A writer in the Sudbury and Timmins Union News did not let Bateman’s comments go unchallenged. The labour writer argued that the one percent figure only represented cases of silicosis granted compensation, which was much smaller than the actual number of silicotics. It was claimed that the companies kept the number of compensation cases down by continuing to employ sick miners until they were no longer productive enough, at which point they were dismissed from their jobs through a lay off or an outright firing. This was blamed on the 1933 amendment to the Workmen’s Compensation Act which withdrew financial support from those suffering from the earliest stages of silicosis.⁸

As suggested in the above reports, business interests diverged from those of the working-class, which placed much greater emphasis on the risks presented by silicosis. In contrast to the Advance’s lukewarm support of the 1927 Mine Workers’ Union resolutions, the apparently pro-labour newspaper, the Citizen, wholeheartedly endorsed the union’s position without offering any praise for existing efforts to compensate and control dust-related illness.⁹ Union organizers placed concern about silicosis within the context of a broader class conflict. Mike Mokry reminisced that the wealthy absentee mine owners built costly estates in tropical locales, but “refused to pay for oil on the roads of Kirkland Lake covered with the crushed rock from underground, filled with silica dust, so that not only miners breathed the dangerous dust, their families did so as well.”¹⁰ When Dr. Norman Bethune visited Kirkland Lake on a fundraising tour for his medical efforts in support of the Republican side of the Spanish Civil War, the tuberculosis expert extended his sojourn to

⁸ IUMMSW, “Real Facts About Silicosis in the Metal Mining Industry,” Union News (November 1936): 8.

⁹ “Silicosis! A National Problem!” The Citizen, 31 March 1927. Clipping located in AO RG13-21-0-32, Silicosis File. The resolutions of the Mine Workers’ Union are discussed on pp. 28-31.

¹⁰ Quoted in Mike Solski and John Smaller, Mine Mill - The History of the International Union of Mine, Mill and Smelter Workers in Canada Since 1895 (Ottawa: Steel Rail Publishing, 1984), 80.

help the International Union of Mine, Mill, and Smelterworkers prepare a report on silicosis in local gold mines.¹¹

The widely circulated local labour journal Union News, written to promote the advantages of, and need for, membership in the IUMMSW, placed a great deal of emphasis on silicosis and the inadequacies of existing measures to control the spread of the disease and to compensate those suffering from the condition.¹² A significant amount of coverage was also given to instances of men being laid off only to discover that their lay off was connected with the presence of silicosis in their lungs. Links were also made between the prevalence of the disease and inadequate wages and housing. Of course, better wages and working conditions, improved company housing, and job security were all items which the Mine, Mill, and Smelterworkers' Union promised to fight for. A union spearheading an organizing drive would not have given such prominence to silicosis if it was not a concern of the workforce.¹³

The holistic approach of the IUMMSW towards silicosis is best represented by an illustration (Figure 2) which appeared in the November 1936 edition of Union News. The illustration portrays the Grim Reaper riding a silicosis vulture or raven, hovering above the "Homes of the Poorly Paid Workers." The caption below the illustration reads:

Many arguments are advanced by the managements of the mining companies of Northern Ontario, that silicosis, the dreaded disease of the metal mining industry, is not contracted in the gold and nickel mines of Ontario.

Nothing is further from the truth than such arguments. In every mining centre in this province there are dozens and dozens of men, idle at present, who have been laid off, on one pretext or another, from the mine. Soon after being laid off in such a manner, the worker finds that he has the Silicosis. He had the disease before he was fired, but it was not made known to him, so that the Company could avoid compensation.

¹¹ Ibid., 81.

¹² In the first year Union News was published (1936), 2000 copies of the monthly were sold according to Laurel Sefton MacDowall in "Remember Kirkland Lake": the History and Effects of the Kirkland Lake Gold Miners' Strike, 1941-42" (Toronto: University of Toronto Press, 1983), 62.

¹³ The need to assess the importance of silicosis to the mine work force will seem less redundant in light of later chapters on the post-war era, when management, in defense of its workplace hegemony, started to claim all credit for health and safety advancements in the face of alleged worker indifference or hostility.

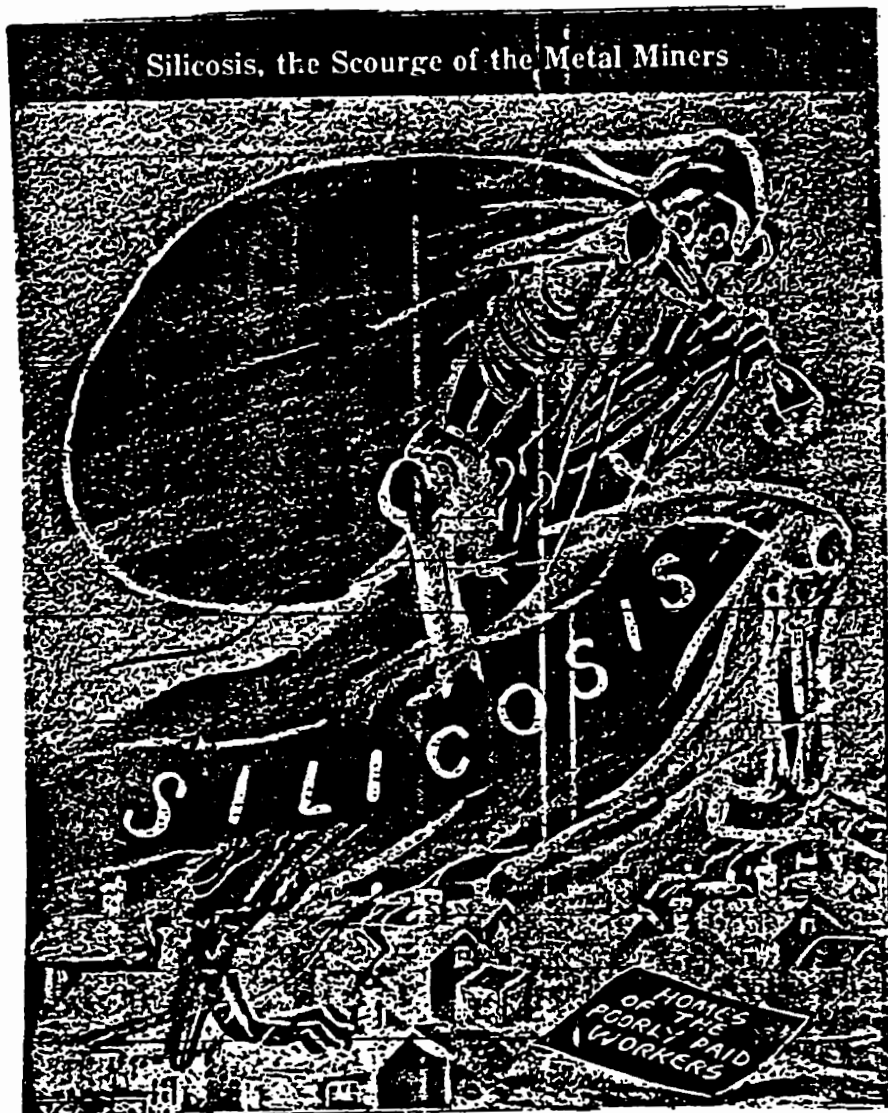


Figure 2
Source: Union News (November 1936): 8.

The working conditions in most of the mines in these parts, together with the unhealthy housing conditions such as exists in company towns like Hollinger Town in Timmins and Creighton Mine near Sudbury, where miners live in what are often called "orange boxes" are regular breeding grounds for Silicosis, and will continue to be such unless the union is built strong enough to make the change.¹⁴

The illustration appeared on the same page as an article which proclaimed that the care of silicosis victims and methods of prevention could be enforced through the union.¹⁵

Other miners preferred to express their fear of silicosis in poetry. An occasional contributor to Union News, "Inspired", composed the following lines as part of a longer poem about mining in the Porcupine:

...
Who gives the mining moguls
The best of his manly days.

The guy who digs the yellow metal
The highly precious Gold
Then contracts silicosis
And is left out in the cold.

The guy who has no protection
That only Union can give
That men may work like humans
And have more time to live.¹⁶

Another poet, working under the pen name "A Lake Shore Miner," composed a poem entitled "Silica Clowns" linking paid vacations and union membership with improved health:

What fools are we miners,
Poor hardrock silica miners.
Like babes in the woods we are lost;
By big bad wolves we are bossed;
Rotting our lungs with decay,
Eating their dust every day.

We believe it's quite fair,
To get two weeks of fresh air,

¹⁴ IUMMSW, "Silicosis, the Scourge of the Metal Miners," Union News (November 1936): 8.

¹⁵ IUMMSW, "Real Facts about Silicosis in the Metal Mining Industry," *Ibid.*

¹⁶ Inspired, [Untitled], Union News (June 1937): 5.

And yet we are slackers
And not C.I.O. backers.
Come! Let's buck up and join today
And have our vacation with pay.

Or laugh clown laugh and reflect
On the silica dread you collect.
You're getting your wage,
Plus a silica stage,
A bonus that's 'never cut down',
Poor imposed upon silica clown.¹⁷

These works suggest that, at least among miners militant enough to support unionization, silicosis was becoming a cultural reference point in the fight for improved living and working conditions. Consequently, these poems may either represent a conscious attempt to create such a conceptual and political understanding, or they may reflect the predominance of concern about silicosis in mining communities.

Those who succumbed to silicosis were portrayed as martyrs in whose memory the struggle for union recognition and better working conditions must continue. On 15 July 1937, Timmins miner Luigi Cortiana died of complications from "that dread scourge of the metal miners" at age 47. After coming to Canada from Italy in 1911, Brother Cortiana began a twenty year mining career that was cut short by occupational disease. A devoted union organizer, the deceased was given a union burial where it was pledged "to follow the splendid example you so willingly and unselfishly set us. We will finish the work that you so earnestly tried to accomplish - the building of a strong union...that silicotic victims may become a thing of the past."¹⁸

The writers of the Union News did not hesitate to pull on the macho heart strings of miners in an effort to emphasize that silicotics were not the only victims of the disease. In an article describing one of the many tales of hardship related at the union office, a miner with fifteen years experience had saved enough money during that time to build and pay for two houses in a quest for future independence. However, after becoming too sick to work, the miner spent one and a half years in treatment at the tuberculosis sanitarium in Haileybury, to

¹⁷ A Lakeshore Miner, "Silica Clowns," Union News (August 1937): 5.

¹⁸ IUMMSW, "In Memoriam - Luigi Cortiana," Union News (July 1937): 6.

no effect because silicosis was difficult to treat. While unable to work, his family received no compensation benefits and they were forced to sell one house to survive. They had recently lost their second house as well, unable to maintain it on a silicosis payment of \$27.00 per month. Upon returning the distraught man to his home, union organizers claimed to have witnessed a Dickensian scene in which “the wife and children gathered around him and begged him not to die, that they needed him oh so much, and please cheer up. ~~that~~ somehow things might turn out well.”¹⁹

It was not just mine and mill workers who were concerned about occupational disease. The wives of these men also worried about silicosis and the emotional and economic hardships their families faced after the disablement of the male wage earner. These hardships included the full-time responsibility of caring for silicotic family members. Among women who supported union organization, silicosis was frequently raised in letters to the “Women’s Column” of the Union News as the primary force motivating them to support unionization of the mining industry. Silicosis thus served as a catalyst for the spread of the union message and working-class solidarity in gold mining communities. One letter demonstrates that networks encouraging union membership existed among miners’ wives. The woman, who signed herself “Union Builder and a Wife”, wrote that:

After I read from a miner’s wife in one of your back issues, it sure awakened me to what to expect from the mines when my husband gets silicosis.

We women can’t carry on a fight against the mines alone. Our only salvation and hope lies in doing all we can to build a strong union and when the mines try to slip something over on us defenceless women, we can place our cases in the hands of the union.

I talked this angle over with my husband and he joined the union. I organize in a sense. I point out the advantages of a union to other women and they all agree with me and I know many who are insisting that their husbands join for their sakes anyway.²⁰

“Union Builder” was not alone in encouraging women to support the IUMMSW as a buttress against the injustices of silicosis compensation.

¹⁹ IUMMSW, “We Must Build the Union and Fight,” Union News (January 1937): 10.

²⁰ Union Builder and a Wife, “Doing Her Part,” Union News (February 1937): 10.

More graphic was a letter from "Let Justice be Done." She warned her sisters-in-arms that if a husband managed to avoid a serious accident, after fifteen or twenty years of mine work, he would instead be weakened by the accumulated effects of silica dust and other impurities, leaving him prone to tuberculosis. "Justice" went on to discuss the inadequate silico-tuberculosis compensation pension of \$27 or \$30 per month, which did not allow a couple to pass their golden years in ease:

The result is, you, the mother and wife, must sell your labor or beg to keep the family and man that the mines have, with full knowledge, destroyed and made incapable of further earning possibilities...The natural reward to expect for long and faithful service is at least some degree of security, with nature showing a balance in the 'bank of old age health' to draw upon in the declining years of life.

It was noted that those living on silicosis pensions often lost the house they had worked so hard to purchase to ensure an independent old age. Instead of hoping that their family would be immune from such a fate, women were advised to encourage their husbands to join the IUMMSW in order to obtain wages high enough to permit savings, to win improved working conditions in the mines, and to fight for more generous compensation pensions.²¹

Just as union organizers tried to raise the awareness of miners and smeltermen who did not take the threat of silicosis seriously, they also tried to reach the wives possessed of a similar viewpoint in order to interest them in union activity. An article in the Union News directed at women presented a list of concerns for the wives of miners. Apart from improved wages and increased job security, all of the issues raised dealt with health, safety, and workers' compensation. Silicosis and economic hardship were treated as going hand-in-hand. It was promised that the union would change the compensation law so that the mining companies would not only be compelled to pay compensation to all silicotics, but to pay an adequate amount. Silicosis was portrayed as being such a menace that it was a husband's moral duty to his family to join the cause of organized labour: "Women who are the wives of miners not yet in the Union kindly consider what your husband's duty is in respect to you and his children in the matter of future security and protection..."²²

²¹ Let Justice be Done, "Your Happiness is Threatened," Ibid.

²² IUMMSW, "Are You Interested In..." Union News (March 1937): 11.

Silicosis loomed large enough in the community life of Timmins and Kirkland Lake to be of concern to municipal politicians. Perhaps troubled by high relief costs brought on by the economic depression of the 1930s and concerned about the condition of their constituents, councillors in Kirkland Lake issued a call for reforms to the Workmen's Compensation Act. Councillor Leslie Hornick informed his fellow councillors that many men were suffering from silicosis in the town, but were unable to obtain compensation benefits because the mining companies declared that they had tuberculosis. In response, councillors M.P. Maguire and W.J. Barrager proposed that a special department of the Compensation Board be opened to deal specifically with northern Ontario. It was felt that the compensation costs provided by this northern board should be supported by income taxes, seemingly to remove the corporate interest in misdiagnosing silicosis. The IUMMSW supported the councillors' crusade.²³ This support provides a comment on the failings of Ontario's compensation board. The miners' union placed great emphasis on forcing the mining companies to accept more responsibility for the human costs of the production process (e.g. better benefits and dust control measures), but they were willing to abandon this stand in favour of one that would have moved the costs for workers' compensation into the public purse, including the income taxes of miners, in the hope that it would bring greater fairness to sick or injured miners.

The widespread occurrence of silicosis and the inadequate compensation laws ensured that in gold mining communities the disease was a hot topic in the provincial election of 1937. The IUMMSW boasted that union demands were the "issue of the election," owing to the strong campaign run by Labor-Farmer candidate Tommy Church, who attracted 7 500 votes. Because of Church, the Liberal and Conservative candidates were also forced to make promises regarding silicosis, compensation, and union recognition. Naturally, and probably with reason, union officials gave full credit for this to the power of the union. A union committee was being organized to visit the victor, Mr. Gallagher, to remind him of the promises he made during the election campaign. Miners were thus urged

²³ IUMMSW, "Silicosis Battle Aim of Council," *Union News* (January 1937): 4. It should be noted that while many miners were wrongly denied silicosis compensation, tuberculosis was quite common in the 1930s and many miners may have been suffering from this disease without silicotic complications. Similar symptoms and better benefits likely convinced many miners with tuberculosis that they had silicosis.

to join the union as the only assurance that their concerns about silicosis and compensation would continue to be noticed by the government.²⁴ Political action on occupational disease and workers' compensation was another way in which the union used the disease to create workplace solidarity and extend it into the community.

The historian Laurel Sefton MacDowall notes that in a single industry community, most employees "will have the same grievances at the same time against the same people."²⁵ This appears to have been the case with silicosis in the mining communities of northern Ontario in the 1920s and 1930s. The sources examined suggest that silicosis was a workplace concern that spilled over into the daily life of Timmins and Kirkland Lake, placing business and labour interests in conflict beyond the mines and mills. While not as significant in delineating the lines of class conflict as inadequate wages and employer intransigence towards collective bargaining, it seems that concern about silicosis, combined with anger over inadequate control and compensation measures, played a role in the development of occupational solidarity among mine workers, preparing the way for the more successful unionization in the future.

²⁴ IUMMSW, "Labor's Needs Recognized in Gold Camps During Election," Union News (November 1937): 4

²⁵ Sefton MacDowall, 50.

Chapter Four: Silicosis During and After the Second World War

Gerald Markowitz and David Rosner argue that by the 1950s silicosis had all but disappeared as a serious concern among those involved in the mining industry, with the exception of a few technical experts and the miners themselves.¹ In Canada, at least, silicosis maintained a higher profile. In a speech to the 1956 Western Canadian convention of the International Union of Mine, Mill, and Smelter Workers, a Cooperative Commonwealth Federation member of the British Columbia legislature, Leo Nimsick, said that the “great killer” silicosis took the lives of more hardrock miners than all other accidents combined.² While silicosis remained a presence in the industry, the disease had to share the stage with an increasingly large cast of occupational afflictions, most notably lung cancer. This reflected increased knowledge of, and concern about, hazardous substances in the working environment, particularly in surface operations where new chemical processes were constantly being introduced in the post-war era.³

During the Second World War, concern about silicosis declined as labour and management put all their efforts into winning the war and the various labour battles that war inspired on the home front. Although the attention received by silicosis decreased during the war, concern about the disease did not disappear. For the gold mining industry of Ontario, silicosis was an ongoing concern due to continually rising compensation costs. To counter the disease, prewar research was put into practice to slow the spread of the disease. The most controversial antidote to silicosis was the use of metallic aluminum dust as a prophylactic against silicosis. Inadequately tested and vehemently opposed by unions, aluminum dust dominated prevention efforts and pushed other silicosis research projects onto the back burner. As this suggests, for management and government officials, both the methods of controlling the disease and of treating sick mine workers continued the pre-war pattern of paternalism and penny-pinching, although new respect for workers and for the power of organized labour was demonstrated through improved consultations and more action on

¹ David Rosner and Gerald Markowitz, *Deadly Dust - Silicosis and the Politics of Occupational Disease in Twentieth-Century America* (Princeton, Princeton University Press, 1991), Chapter 6

² IUMMSW, “Leo Nimsick, M.L.A. Criticizes B.C. Workmens’ Compensation Board on Air,” *Mine-Mill Herald* (February 1956): 2.

³ IUMMSW, “Unsafe and Unhealthy Working Conditions,” *Mine-Mill Herald* (March 1956): 4.

workers' demands. It was the sustained rise of unions that expanded the definition of silicosis, improved compensation benefits, and forced greater action on silicosis prevention. However, the increased strength of labour heightened capital's defense of management rights and the voluntary regulation of health and safety. For its part, the labour force demonstrated a greater forcefulness in pressing their grievances and demanding a role in the silicosis policy process. As compensation laws gradually improved, miners concentrated on ensuring that benefits were paid to all silicotics. With the basic needs of sick members now being met, unions could devote more effort to fighting silicosis through altered work processes and better medical and engineering research. To help win the uphill struggle for better prevention techniques and greater labour participation in health and safety, government support was continually sought and rarely obtained.

The number of miners working in highly siliceous mines remained fairly constant throughout the period discussed below. The number of miners employed in gold mining peaked in 1941 at almost 22 000, then declined relatively quickly on account of the soft gold market that developed in the later war years and continued into the post-war era. By 1956, the number of men working in gold mining and processing had fallen to 10 300. However, much of the slack had been taken up by uranium mining, which grew phenomenally from 400 employees in 1955 to 11 500 in 1958. Seventy-five percent of the men employed in these industries were exposed to silica dust, including those working in the mines, crusher houses, mills, and assay offices. The highly automated nature of surface operations ensured that ninety-five percent of the workforce exposed to dust worked underground.⁴ These employment levels, combined with the forward march of mechanization, ensured that a steady flow of men would apply for silicosis compensation into the 1970s.

Compensating Silicosis

Ontario's policy on the compensation of silicosis was characterized by a considerable degree of continuity between the pre-war and post-war era. The basic philosophy of

⁴ John F. Paterson, Silicosis in Hardrock Miners in Ontario (Toronto: Department of Mines Bulletin 158, 1959), 1.

compensating lost income and the administrative structure of the silicosis compensation system remained the same. However, some changes were made in an effort to appease an increasingly strong labour movement and to reflect changing attitudes towards - and knowledge about - occupational disease in general and silicosis in particular.

Perhaps the most commendable improvement to compensation legislation in Ontario was the removal in 1946 of the restricted time in which a miner could apply for silicosis compensation after leaving dust employment in Ontario. The new legislation was made retroactive to cover all men who had worked in the provincial mining industry for at least two years. This change had been a demand of labour since the first silicosis legislation was passed in 1926. The stipulation that a silicosis claim could only be submitted within five years of leaving mining was particularly odious as dust control measures improved and silicosis began to take over ten years to develop. The revised law effectively expanded the legal definition of silicosis.⁵

Eligibility requirements for silicosis were lessened in response to the lobbying of labour unions. In Ontario's original silicosis legislation, a miner was required to have at least five years of dust exposure in Ontario before becoming eligible to receive worker's compensation. In 1939 this was reduced to three years, and in 1944 it was further reduced to two years of dust exposure in the province. In addition, a miner no longer became ineligible to receive compensation if he did not leave dusty work after being granted compensation. A miner awarded compensation for partial disability was able to continue working where dust was present and still receive an increase in his benefits should his health worsen.⁶ This allowed a miner to keep his source of livelihood and recognized the difficulty he would encounter in finding another job as a silicotic. It also gave the individual the ability to determine what was in his best interest, not the Compensation Board or a doctor. The change may also have reflected new evidence that a person never recovered from silicosis and that removing a silicotic from dust did not necessarily stop the progression of the disease.

⁵ McIntyre Research Foundation, ed. Conference on Silicosis and Other Industrial Pulmonary Diseases (Toronto: McIntyre Research Foundation, 1963), 2.

⁶ "Silicosis as Seen by the Ontario Workmen's Compensation Board." Speech by E.E. Sparrow, February 1954.

A worthy change to the Workmen's Compensation Act of Ontario was the improvement of the permanent disability pension. From its inception in 1914, the Compensation Act had paid a fully disabled worker 66 and 2/3 percent of his former income, up to a weekly maximum that changed occasionally to reflect changes in the cost of living. On 1 January 1950, the disability allowance was raised to cover a slightly more reasonable 75 percent of the former salary.⁷ Ontario's compensation board deserved credit for its cost-efficient structure that benefitted sick workers in instances when they actually were granted compensation. Although one of the biggest complaints of organized labour involved the inadequacy of disability pensions, most of the revenue collected by the WCB went to workers. Of every dollar assessed, 88 cents went to sick or injured workers, seven cents was devoted to administration, and five cents went to various accident prevention programmes.⁸

Another of the few ways in which the Ontario Workmen's Compensation Act favoured employees over employers was its granting to workers the right to choose their own physicians. This not only gave employees control over the management of their personal health, but removed them from the potential bias of doctors employed by companies or kept on the roster of acceptable practitioners by employers and the WCB. In addition, the Board paid the medical expenses of a sick worker, even if he did not suffer a loss in wages. The annual chest examinations necessary to maintain a Mining Certificate continued to be conducted by the staff doctors of the Compensation Board. The law recognized the privacy of health information by requiring the doctors to keep test results private. An employer could not be informed about an employee's health without the written consent of the man concerned. However, complaints of unjust firings suggest that companies continued to keep an eye on the health of its employees by conducting their own x-ray programmes.⁹

The creation in 1950 of the Medical Statistics Unit of the Workmen's Compensation Board was a notable development in the administrative history of silicosis. The Statistics Unit developed a system for reporting and recording the records of miners exposed to dust. The data was analyzed for patterns in the prevalence and progression of silicosis in the

⁷ Ibid

⁸ Ibid.

⁹ Ibid.

provincial mining industry. The statistical study was undertaken in response to a 1949 request by the Ontario Mining Association for more information about the silicosis situation. The unanalyzed records held by the Compensation Board were thought to be a useful source of information on such things as the incidence and prevalence of silicosis in Ontario mines, the length of exposure necessary to produce the disease, and the rate at which the disease progressed once acquired. The status of silicosis cases could now be updated on a regular basis.¹⁰

A long-standing grievance among mobile mine workers was the provincial residency requirement that made it difficult to collect compensation for silicosis if a miner changed provinces. In the 1920s, demands were made for the federal government to assume responsibility for silicosis compensation. In the 1950s and early 1960s, demands were made for the abolition of residency requirements and for an agreement between the provinces that would allow a sick worker to receive silicosis compensation regardless of where he contracted it or resided.¹¹ In the case of diamond drillers involved in mine development, they could spend an entire career employed by the same company, but each assignment could send them to a different province, leaving them ineligible for anything but the most meager compensation.¹² As Canadian citizens, miners were able to move from one provincial labour market to another, but compensation benefits were not as portable. This was one more way in which the costs of silicosis were shifted onto the working-class. Mining companies did not want to assume the compensation costs for silicosis acquired at least partially in another province. At the same time, these companies did not hesitate to lay off workers, an event which often necessitated an inter-provincial relocation in search of another mining job. Surprisingly, it was the arch-conservative Social Credit government of British Columbia that was the first to take action on this front. In an address to the British Columbia District convention of Mine Mill, the provincial minister of labour, Lyle Wicks, announced that an

¹⁰ Memorandum from N.F. Parkinson, Executive Director, OMA, 25 January 1950, AO F1352-3-0-4, OMA Papers, McIntyre Research Foundation; Angus D. Campbell, "Trends in the Development of Silicosis in Ontario Miners and Aluminum as a Factor in Prevention." Paper presented to the Chairman and Directors, McIntyre Research Foundation, December 1961, AO F1352-3-0-10.

¹¹ IUMMSW, "No Agreement on Compensation for Silicosis," Mine-Mill Herald (May 1961): 13

¹² William Kennedy, "At Ontario Compensation Hearings - Employers Outnumber Labour Two-to-One," Mine-Mill Herald (October 1966): 10.

amendment had been made to the Compensation Act permitting the province to reach reciprocal agreements with other provinces for the compensation of silicosis. Unfortunately, British Columbia would not be able to complete any such agreements until the other provinces passed similar reciprocity legislation. Wicks recommended that Mine Mill concentrate on lobbying Ontario and Quebec, where silicosis was also a serious problem, to follow British Columbia's lead.¹³

The union tried to get each province to participate in a reciprocal compensation agreement, but found its efforts hindered by the Canadian tradition of inter-provincial squabbling. The first hurdle involved harmonizing different compensation regulations in different jurisdictions. In Ontario, silicotics were compensated based upon the degree of their disability, as long as they had been employed in a job exposed to silica dust in Ontario for at least two years. In contrast, other provinces such as Manitoba reduced a person's compensation benefit if his employment history showed he had worked in the mining industry of another province. Despite these differences, only Ontario expressed a strong objection to the union's suggestion for a reciprocal agreement on pro-rated silicosis compensation. Ontario felt that reducing the minimum required period of dust exposure was the best way of dealing with the problem. This position was based on the great difficulty medical authorities had in determining how much responsibility each jurisdiction had for a person's disability. Ontario instead thought it would be better for each province to pay full silicosis benefits, as it did, though residency requirements could be lowered to increase the fairness of this policy. The provinces would also have to agree upon a common definition of silicosis in its compensable form.¹⁴ As late as 1966, labour unions were making the same arguments for reciprocal benefits as they had been for the last several decades. Most of the provinces had passed legislation by that time permitting reciprocal agreements. The notable exception was Ontario.¹⁵

¹³ IUMMSW, "Mine-Mill is Workers' Spokesman - L. Wicks," *Mine-Mill Herald* (February 1956): 2. I thank James McCrostie for referring me to sources on silicosis compensation in British Columbia.

¹⁴ IUMMSW, "No Agreement Between Provinces on Compensation for Silicosis," *Mine-Mill Herald* (May 1961):

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¹⁵ William Kennedy, "At Ontario Compensation Hearings," 10.

A report on silicosis by University of Toronto medical professor John Paterson released in 1959 summarized the post-war procedures for detecting and compensating silicosis. In most instances, silicosis, tuberculosis, and silico-tuberculosis were detected by the medical officers at the Miners' Chest Examining Stations. Other cases were detected by physicians during non-employment related examinations, often after a man had left his job in the mining industry. When a medical officer suspected that a mine worker had silicosis, it was his duty to inform the miner to file a claim with the Workmen's Compensation Board. The Silicosis Referee Board would then examine the case and advise the Compensation Board whether or not the claim should be allowed. The recommendations of the Referee Board were always accepted. The presence of silicosis in a person's lungs did not warrant compensation in itself. Since 1933, there had to be some disability resulting from the condition. This distinction was problematic when physicians inexperienced with industrial pulmonary diseases made the diagnosis and misinformed their patients about the possibility of receiving compensation.¹⁶

While there were certainly many legitimate cases of silicosis cheated out of compensation, there were also instances in which physical symptoms were incorrectly attributed to silicosis. When a miner found himself becoming short of breath, there was a tendency for the patient and his physician to attribute the condition to silicosis on the basis of the man's occupation and the appearance of shadows on his chest x-ray, which were often caused by normally prominent blood vessels, another pulmonary disease, arteriosclerotic heart disease, or the ageing process. Placing his trust in his family physician, the miner then felt he was treated unjustly when the silicosis experts of the Compensation Board rejected his claim. One of the main reasons for the misdiagnosis of silicosis was attributed to the rarity of this working-class disease outside of mining centres. For this reason, Paterson felt it would be difficult to improve how medical students and interns were taught about industrial pulmonary disease.¹⁷ He ignored the role of class bias in the amount of time spent studying and teaching different medical conditions. As silicosis was confined to those working in dusty occupations, the disease might have seemed unimportant or distant to those whose

¹⁶ Paterson, Bulletin 158, 18.

¹⁷ Ibid.

backgrounds enabled them to study medicine in an era before higher education became highly subsidized by the state and before many working-class incomes had reached middle class levels. Industrial diseases such as cancer and asthma that afflicted all members of society may have seemed more menacing to both doctors and those who dispersed research money.

Paterson also felt that controversies developed because of miners' high expectations of contracting silicosis. Any breathing difficulties and weakened physical ability were assumed to be the result of silicosis and the miner automatically ruled out other causes. Because of the publicity silicosis received in mining communities, Paterson believed that many miners failed to realize that they were just as likely to develop other lung conditions such as asthma, emphysema, lung cancer, or arteriosclerotic heart disease - all afflictions that could also plague a white collar worker. Increased breathlessness was also caused by increases in age and weight.¹⁸ On the other side of this balanced ledger, doctors and compensation officials often failed to acknowledge that silicosis encouraged the development of a variety of medical conditions that were not traditionally considered occupational diseases.

In cases where a diagnosis of compensable silicosis was uncertain, there were two ways in which the problem was resolved. The first, and most preferable one from the worker's standpoint, gave the benefit of doubt to the miner and granted him compensation. When death came knocking, the family physician was to obtain an autopsy to confirm the diagnosis of silicosis. The continued payment of silicosis benefits to the family depended on a confirmation that silicosis was present. The second course of action dealt with silicosis cases that had been too doubtful to compensate while the miner was alive. Upon his death, the family was asked to submit the body for autopsy. If silicosis was found, a survivor's pension could be granted and a payment made for disability suffered prior to death. If silicosis was present but was not a contributing cause of death, the pension was not granted, but a payment was frequently made to compensate for disability experienced prior to death.¹⁹

¹⁸ Ibid.

¹⁹ Ibid., 19.

Ontario was ahead of some other jurisdictions in recognizing that death caused by diseases other than silicosis were often present, or more serious than normal, on account of silicosis. Unfortunately, related diseases could still be used to deny a widow a pension, particularly when linked to the ageing process. This was especially true by the 1950s, as tuberculosis rates declined and the average life expectancy of silicotics approached that of a normal male. According to Paterson, as silicotics began to live longer, they naturally became more likely to develop other diseases in the same way as non-silicotic men. Between 1926 and 1958, 329 silicotic miners died of causes unrelated to silicosis. When these miners had wives and children, their survivors received no further compensation.²⁰ It is unclear how the physicians of the time were able to distinguish between a contributory and a non-contributory role for silicosis. In either event, this policy treated the economic realities of working-class families with disdain. When a miner had to leave his job on account of silicosis, his income dropped up to fifty percent and made the accumulation of savings difficult. By not paying his survivors a silicosis pension, no recognition was given to the ongoing economic insecurity faced by the family on account of silicosis, even if the disease was not the immediate cause of death. Such an argument assumed that the suffering caused by silicosis did not end with the death of the silicotic individual and to ignore this fact was another instance of compensation costs being shifted onto the individuals least able to afford the restrictive bureaucratic definition of silicosis.

It has been seen that during the 1930s, defining disability and setting a compensation level to match was a source of considerable controversy. The debate over assessing disability continued into the 1940s. In most jurisdictions the legal definition of disability was based upon a loss of earning power. This bureaucratic definition of illness irked medical practitioners, who sought a greater role for their profession in the field of workers' compensation. Dr. George Wright, a researcher at the Trudeau Foundation in Saranac Lake, New York, argued that earning power could be maintained as an illness progressed by

²⁰ Ibid: "Silicosis in Ontario Mines: Extract from the 34th Annual Report of the Mines Accident Prevention Association of Ontario, May 1965," 32, AO F1352-2-0-6, OMA Papers. Royal Commission on the Health and Safety of Workers in Mines. William Paterson, Silicosis in Hardrock Miners in Ontario - A Further Study (Toronto: Ministry of Natural Resources Bulletin 173, 1973) reported on page 4 that the primary cause of death in silicotics was right heart failure, something not uncommon among elderly people.

working more steadily during a work period.²¹ In other words, a person could experience increasing disability with no loss of earning power. Those responsible for paying compensation costs likely had little problem with such a system. However, Wright proposed a more enlightened system based upon “the physiological integrity, the health and well-being of the individual.” This system would have compensated a sick or injured worker for the loss of his health beyond the normal decrease in work capacity caused by the ageing process, not for his loss of income.²² The ageing process, not the effect of silicosis, was cited by mining executives as the real reason many men complained of disability.

In the opinion of Wright, there were three types of partial disability which could manifest themselves in silicotics. One involved the loss of breathing capacity - the shortness of breath which most apparently characterized silicosis and was the cause for most disability claims. This condition was often accompanied by coughing, chest pain, and an increased susceptibility to respiratory infections.²³ These symptoms demonstrate how easy it was for employers to deny the occupational status of silicosis, as these signs were also symptomatic of tuberculosis and the wrath of Father Time. The second form of partial disability reflected the increased risk a silicotic had of developing tuberculosis, which hurried the progression of the illness and increased the chance of an early death. This was described by Wright as disability based upon the increased chance of suffering. In contrast, Ontario punished a person for developing tuberculosis with a lower pension for silico-tuberculosis. The third type of disability was described as an economic disability. This disability was present from the time silicosis was diagnosed because the diagnosis practically excluded a worker from any new employment in an occupation with a silicosis danger. This decreased a man’s employment mobility and meant that he was no longer a “free agent” in the labour market.²⁴

²¹ George W. Wright, “Medical Aspects of Compensation for Partial Disability from Silicosis.” in Industry, Tuberculosis, Silicosis, and Industry - A Symposium, ed. Leroy U. Gardner (New York: National Tuberculosis Society, 1945), 99. Wright’s lecture is particularly applicable to the case of Ontario, as Dr. A.R. Riddell from the Division of Industrial Hygiene of the Ontario Department of Health is acknowledged for his helpful comments upon the problems faced by the province’s Silicosis Referee Board in administering compensation for partial disability.

²² *Ibid.*

²³ *Ibid.*

²⁴ *Ibid.*, 100

Much of what Wright argued was based on the example of Ontario, which had a complicated system for determining and compensating partial disability. The degree of a person's loss of function was measured in percentage terms. If a miner was found to be fifty percent disabled and left the mining industry, he would receive 50 percent of 75 percent of his former salary.²⁵ If he continued to work, he would receive compensation based either on the difference between his current and former income or on his calculated disability pension, whichever was the lesser amount. If a man's silicosis progressed, his pension was adjusted to reflect his increased disability.

Despite improvements to the Workmen's Compensation Act of Ontario, the mining industry and its lackeys at the Compensation Board continued to downplay the importance of silicosis, and thus minimize compensation costs, by taking advantage of the close link between silicosis and tuberculosis to deny compensation to miners with silico-tuberculosis. The close relationship between tuberculosis and silicosis was recognized in the scientific community, and L.E. Hamlin, a company doctor in Pennsylvania, acknowledged that it was often difficult to distinguish occupationally related tuberculosis from silico-tuberculosis, except that the latter usually progressed more rapidly. He also noted that the majority of deaths among silicotics occurred when that disease was accompanied by tuberculosis. Silico-tuberculosis was described as being chronic and slowly progressive, although it could progress very rapidly in younger men.²⁶ That those involved in combatting tuberculosis saw a reduction in silicosis as integral to their campaign is emphasized by the fact that the conference at which Hamlin spoke was sponsored by the National Tuberculosis Society (of the United States). In contrast, the Ontario mining industry obfuscated scientific evidence to emphasize that a reduction in tuberculosis was integral to the campaign against silicosis. Angus Campbell, an Ontario mining engineer, noted that "tuberculosis had always been considered the real problem in Ontario by mine managements, and the Medical Examiners and Board connected with silicosis."²⁷

²⁵ According to my calculations, this is equivalent to 37.5 percent of the man's former income.

²⁶ L.E. Hamlin, "Review of Silicosis for the Industrial Hygienist and Medical Practitioner," in Industry, Tuberculosis, Silicosis, and Compensation - A Symposium, ed. Leroy U. Gardner (New York: National Tuberculosis Society, 1945), 55, 58.

²⁷ Angus D. Campbell, "Some Comments on the Pneumoconiosis Conference held February 9 to 24, 1959 at Johannesburg, Transvaal, Union of South Africa," Paper presented 26 January 1960 at the Conference of the

This position reduced the importance of taking dust prevention measures in the mine and shifted the responsibility for silicosis incidence from the mining companies to mineworkers at risk of contracting tuberculosis. This justified the role of employment screening and the focus on individual suitability for dusty work, while leaving existing dust control measures as satisfactory. If tuberculosis could be eliminated, silicosis would disappear as a problem without further expenditure. South Africa avoided this controversy by recognizing the role of dust exposure in increasing a person's chances of contracting tuberculosis and the role of tuberculosis in transforming silicosis into a disabling condition. In admitting to the close link between the two diseases, South Africa granted workers' compensation to any miner with tuberculosis who possessed at least three months of industry experience.²⁸

The practice of removing vulnerable employees from the workplace continued and expanded to other industries as its merits became known. As a public health measure, workers in many North American industries were x-rayed for tuberculosis prior to employment and throughout the term of their engagement. These programmes were effective in reducing the incidence of new cases of tuberculosis.²⁹ The difference between this notable programme and the x-ray programme of the Ontario mining industry was that in best practice, sick workers were detected and given treatment in order that they might return to work. It has been seen that in Ontario's mining industry, unhealthy x-ray results were often used as an excuse to fire a worker, not help him. In addition, as long as dust levels remained high, reducing tuberculosis might decrease the disability level of silicotics, but it would not have much impact on the incidence of the disease.

Since the Compensation Board refused to accept tuberculosis as an occupational condition, the labour movement assumed some of the responsibility for the needs of its sick

McIntyre Research Foundation, AO RG13-20-0-100, Department of Mines. Mines Inspection Branch - Reports, Papers, and Proceedings.

²⁸ Lukin Robinson, "Dust Control the Best Protection," *Mine-Mill Herald* (November 1956): 7. In G.W.H. Schepers, "Silicosis and Tuberculosis," in *Conference on Silicosis and Other Industrial Pulmonary Diseases*, ed. McIntyre Research Foundation (Toronto: McIntyre Research Foundation, 1963), it is reported on page 54 that this nearly fifty year old practice came to an end on 1 October 1962, when compensation for tuberculosis was drastically restricted.

²⁹ Ada Chree Reid, "Control of Tuberculosis in an Industrial Group," in *Industry, Tuberculosis, Silicosis, and Compensation - A Symposium*, ed. Leroy U. Gardner (New York: National Tuberculosis Society, 1945), 26.

members. A motion from the floor of a meeting of the McIntyre Mines local of the United Steelworkers of America proposed the establishment of a fund to provide spending money to members confined to sanatoria. Many un pensioned miners in provincial sanatoria did not have the money to buy niceties such as shaving materials, postage stamps, and cigarettes (what every lung patient needed for a speedy recovery). The sick members were deemed worthy of compensation because their ill health was attributed to conditions in the mines. The motion was approved and \$25 was collected to start the fund.³⁰

By the 1960s, efforts to control tuberculosis in Canada and the United States had been so successful that it was a struggle to keep the links of tuberculosis with silicosis at centre stage. It was difficult to demonstrate the difference between tuberculosis acquired randomly by a member of the general population and tuberculosis acquired by a silicotic miner, that would have healed without the presence of silicosis. This created pressure to decertify any form of tuberculosis as a compensable industrial disease. The problem of diagnosis, and by extension compensation, lay in cases where the diagnosis of silicosis or tuberculosis was not clear cut. At one extreme was the situation in which a man's symptoms were very similar to uncomplicated silicosis and where the presence of tuberculosis was often confirmed only after death. At the other extreme were cases in which the signs of tuberculosis dominated, hiding the presence of silicosis until detailed histology and chemistry tests could be completed.³¹ Contrary to earlier teaching, by the 1960s, x-rays were said to be of only limited help in distinguishing between silicosis and tuberculosis infection.³² The impact of silica exposure on the development of tuberculosis was evidenced in Ontario by a 1960 study of silicotics in the Porcupine mining camp. The study found that one third of silicotic miners examined had had tubercle bacilli in their sputum at some point in time. Another study found that seventeen percent of silicotics in Ontario had a history of tuberculosis, compared with .05% of the highest risk group in the general population.³³

³⁰ "Unpensioned Miners Fund Established by Steelworkers," Timmins Press (28 September 1954), Press clipping from AO F1352-3-0-6, OMA Papers, McIntyre Research Foundation.

³¹ Schepers, "Silicosis and Tuberculosis," 54-5, 64-6.

³² Stefan Grzybowski, "Tuberculosis: Its Prevention and Management with Special Reference to Silicosis," in Conference on Silicosis and Other Industrial Pulmonary Diseases, ed. McIntyre Research Foundation (Toronto: McIntyre Research Foundation, 1963), 75-6.

³³ *Ibid.*, 74-5.

As with tuberculosis, the efforts to reduce the incidence of silicosis in Ontario appear to have been fairly successful, as the statistics suggest.³⁴ Much of Mine Mills' concern about silicosis in the 1950s revolved around winning compensation for those suffering the effects of the abominable working conditions of an earlier era. By the 1960s, even the compensation of silicotics was no longer an important concern of the union, if the dearth of articles on the disease in the Mine Mill Herald during the 1960s provides any indication. The absence of such articles could also be a reflection of union politics, not epidemiology, due to Mine Mills' loss of its gold and uranium mining locals to the United Steelworkers. By the middle of the 1960s, the IUMMSW only represented nickel miners, an industry in which silicosis was not a serious problem. This change in the composition of its membership left the union fighting for better safety and more generous compensation benefits.

Although it may have disappeared from the limelight, silicosis continued to act the villain. This is clear from the records of six men granted disability compensation in 1970. Fifty-six year old Robert Beck, a German immigrant, had accumulated silica dust in his lungs between 1952 and 1966, a condition aggravated by the presence of tuberculosis. He spent ten years of his mining career in the uranium industry. Given the abhorrent underground environment that existed in uranium mines in the 1950s, it seemed a little unfair that Beck's compensation was assessed to the Copper Corporation, where he had last worked for forty-five months.³⁵ The Canadian-born miner William Miller worked underground from 1941 to 1961. He developed silicosis at age sixty, nine years after leaving mining. Most of his career was spent mining gold and uranium. The latter was deemed responsible for his silicosis. Anthony Carluccio was only forty-nine when he received compensation for disabling silicosis. He began work in gold mines shortly after his arrival in Canada from Italy in 1951. Although he only mined for nine years and did not have tuberculosis, Carluccio still developed silicosis, a sure sign that silica dust levels remained high in at least some working areas. Ukrainian-born Steve Shypowskyj worked at the Pickle Crow gold mine from 1951 to 1960. He developed silicosis in a compensable form at age fifty-two. Shypowskyj's compatriot Jerry Marusiczak spent four years in the coal mines of Belgium and another four

³⁴ See discussion below, pp. 132-6.

³⁵ For a detailed discussion of conditions in the uranium industry, see Chapter Four.

years from 1952 to 1956 in the gold mines of the Porcupine. This was enough time for him to have developed silicosis by age fifty-one. Carl Anderson worked in the gold mines of the Red Lake area from 1954 to 1967. Although he commenced his mining career at fifty-three, he still had silicosis by the time he reached sixty-nine. These silicotics received special attention because they all started mining in Ontario during the 1940s and 1950s, by which time silicosis prevention had made considerable progress. It is interesting that three of the six miners had spent between one and one-half to four years in Belgian coal mines.³⁶ It is not known if this would have been enough time to harm their lungs, but it is plausible that health protection was not the number one priority in war-torn Belgium during its reconstruction period. What is clear from these cases is that silicosis was not yet fully under control.

Controlling the Disease

“The Lord helps those who help themselves.” These words, spoken in 1951 by Norman Parkinson, Executive Director of the Ontario Mining Association, summed up mining industry policy on the management and prevention of silicosis: voluntary efforts to cope with a problem such as industrial disease avoided “cumbersome and irksome regulations forcefully applied,” which were rarely as effective as measures undertaken willfully. However, Parkinson’s speech makes it clear that without the pressure of compensation costs, the spirit of volunteerism would probably have remained dormant. He discussed progress on silicosis in terms of a balance sheet - an apt metaphor for the industry’s response to silicosis as an issue of costs and benefits instead of as a moral or health crusade. It was noted that for each case of silicosis prevented, the industry saved about \$30 000 in compensation costs.³⁷ It is questionable whether as much time and money would have been

³⁶ AO F1352-3-0-12.1, OMA Papers, McIntyre Research Foundation.

³⁷ Norman F. Parkinson, “The Prevention of Silicosis in Ontario Mines,” Paper presented at McIntyre Research Foundation Conference on Silicosis and Aluminum Therapy, Schumacher, Ontario, 29-31 January 1951, AO F1352-3-0-3, OMA Papers, McIntyre Research Foundation. References to the economic benefits of ventilation and dust control are made frequently in the post-war writings and presentations of industry representatives. See for example C.S. Gibson, “Limiting Factors in Dust Control and Ventilation,” Paper presented to the Sixth Annual Conference of the McIntyre Research Foundation on Silicosis, 1-3 February 1954, AO F1352-3-0-3, OMA Papers, McIntyre Research Foundation.

directed towards silicosis prevention without the motivating factor of compensation costs, given the tendency of the industry to evaluate decisions on a financial basis.

In the post-war era, industrial hygiene in general, and silicosis in particular, became increasingly specialized professional fields.³⁸ This development had the positive effect of increasing knowledge about health and safety. On the negative side, the increased specialization of the health and safety field meant that senior managers, engineers, and government officials became less knowledgeable about silicosis and less involved in the silicosis policy process. Unfortunately, safety engineers and industrial hygienists were not the most prestigious positions in the mining industry. Health and safety advocates called for this to change, but to little avail.

Perhaps aware of their lack of influence in the corporate structure, physicians sought to increase their role in management decision-making. Silicosis provided a route to pursue this end. One American company doctor proclaimed that “good practice in the management of the silicotic as well as in the solution of the whole problem of silicosis demands that physicians assume a greater responsibility for the conditions under which their patients work.” This was the same increase in workplace responsibility that unionists were clamouring for. The doctor went on to promote a working-class advocacy role for physicians: “It should be required that the air these patients breathe be made to conform to established minimum standards of freedom from dangerous dusts. The physician who fails to do this is not justified in permitting the patient to continue in his hazardous employment.”³⁹ It was argued that the primary responsibility of the doctor was not to his corporate employer, but to the patients he served. A good doctor managing a silicotic patient should advise the patient truthfully about the necessity for a change in employment. Quoting R.R. Sayers, who headed the Division of Industrial Hygiene in the United States Public Health Service, the physician stated that a man need not be removed from his accustomed

³⁸ For a more detailed discussion of this development, refer to David Rosner and Gerald Markowitz, Deadly Dust - Silicosis and the Politics of Occupational Disease in Twentieth-Century America (Princeton: Princeton University Press, 1991), 7, 194-8.

³⁹ Bamberger, “Management of the Silicotic Patient,” 86.

work and be deprived of his income simply on the basis of a diagnosis of simple silicosis. It was more important to remove the dust than the man."⁴⁰

In spite of the efforts of health professionals to move into the director's chair in order to influence silicosis policy, mine operators maintained their leading role. Citing the rights and responsibilities of management, the operators worked hard to preserve their dominant position in the fight against silicosis in order to demonstrate that the voluntary approach to occupational health and safety regulation was working. In 1934, the Ontario Mining Association had established a Technical Silicosis Research Committee to spearhead the industry's response to the disease. An engineer, C.S. Gibson, was hired to advise the OMA and its members on mine ventilation and silicosis control. In 1943, this body was replaced by the Committee on Silicosis attached to the industry-funded Mines Accident Prevention Association of Ontario. Gibson stayed on as chief engineer and secretary.⁴¹ The MAPAO was financed by the Ontario Mining Association and by the Workmen's Compensation Board, out of assessments paid to the Board by mining companies. It was under the auspices of the MAPAO that industry self-regulation manifested itself most fully. MAPAO provided management with the means to police themselves. Association engineers assisted mine managers and ventilation engineers in their efforts to enact preventive measures against silicosis. At mines where dust control was deemed to be receiving insufficient attention, the Association suggested that benefits might accrue from a ventilation study. To emphasize the sacrifices made to improve workplace conditions, the mining industry was always eager to point out the high cost of the ventilation systems installed voluntarily. The installation of 250 000 cubic feet per minute of fan capacity at the Kerr-Addison Mine in Kirkland Lake cost \$300 000. To put the cost of worker health in a different perspective, Kerr-Addison paid \$3 689 634.78 in dividends in 1950.⁴²

In the post-war years, the ongoing appearance of new silicosis cases emphasized to engineers concerned with industrial hygiene that the prevention of industrial pulmonary disease was an uphill struggle. The forward march of capitalist production processes ensured

⁴⁰ Ibid.

⁴¹ Paterson, Bulletin 158, 31; Paterson, Bulletin 173, 2.

⁴² Paterson, Bulletin 158, 25; Gibson, "Limiting Factors in Dust Control and Ventilation", Ontario Department of Mines, Annual Report, 1923, 14.

that new challenges to a healthy workplace were continually being introduced. As in previous decades, the main problem was the ever faster pace of production. In 1926, 640 tons of ore was milled for every gold miner. By 1954, this amount had risen to 886 tons for every gold miner.⁴³ C.S. Gibson, the chief engineer of the Committee on Silicosis observed that “drills are drilling faster; the methods of mining and moving muck are being speeded up; new and improved processes are being used in plants. The purpose is, of course, to raise productivity and decrease costs.” However, there was a price for decreased costs - increased levels of dust in the atmosphere. As an example, loading wet rocks into ore cars with a hand shovel generated a safe dust level of 150 particles per cubic centimetre. The introduction of mechanical shovels raised dust levels two to four times. The best way to avoid paying the price was to guard against increased dust hazards in the planning stage. How this applied to older mines introducing new methods is not stated.⁴⁴

Those involved in the introduction of new production processes were seen to have the responsibility for guarding against dust hazards. Gibson criticized many equipment manufacturers for not trying to correct the features of their product that created excessive dust, especially since it was easier to incorporate dust control measures into the design of equipment than to add features later on. The designers of mines and of production processes also had a responsibility to ensure dust levels were minimized. Gibson felt there were many examples to demonstrate that these people were doing their jobs well, but there were also many instances in which such concerns were inadequately dealt with, if they were given consideration at all. The last stand against unhealthy practices was management, which oversaw both the design and production phases. The ultimate failure to control dust adequately was seen to rest with managers who neglected to make changes when they had the opportunity.⁴⁵ The continued failure of managers, engineers, and planners to consider dust control a priority points to the fundamental weakness of the voluntary system of

⁴³ Committee of Inquiry into the Economics of the Gold Mining Industry, Gold Mining in Ontario (Toronto: Government of Ontario, 1955), 113.

⁴⁴ Gibson, “Limiting Factors in Dust Control and Ventilation”; C.S. Gibson, “Current Problems in Dust Control in Metal Mines,” Paper presented at the McIntyre-Saranac Conference, 7-9 February 1955, AO F1352-3-0-15, OMA Papers. McIntyre Research Foundation.

⁴⁵ Gibson, “Limiting Factors in Dust Control and Ventilation”; Gibson, “Current Problems in Dust Control in Metal Mines.”

regulation - it was only as effective as the people involved. A few indiscretions could be fatal. This problem might have been avoided with carefully and thoroughly designed legislation on dust control measures for mines and for mining and smelting processes. If properly enforced, such legislation might have reduced the frequency with which such omissions occurred. This situation also illustrates the lack of influence of health and safety experts in the corporate structure. Of course, some criticism must also be levelled against a highly competitive system in which there existed constant pressure to introduce new machines and methods for the purpose of increasing productivity and lowering costs, when functional and relatively safe production methods were already in place.⁴⁶

Gibson coolly reassured his audience that even in the face of increased dust levels, the risk of silicosis was decreased because new production techniques involved fewer workers. This was likely of little consolation to the workers still at risk of developing silicosis or to the other men who found themselves unemployed. However, the extensive size of most new operations made the expense of an excellent ventilation system economically justifiable. As mining changed, the cost of ventilation became smaller in comparison with other start-up costs.⁴⁷

In addition to new problems caused by production changes, dust control was not as simple as previously thought. Dust continued to be generated by three basic tasks: drilling, blasting, and handling broken rock. Those involved in drilling were the most likely to become silicotic. Dust control was still governed by the basic steps of preventing dust from becoming airborne, isolating the sources of dust generation, and removing dust from the atmosphere. The most basic step in dust control was the use of water. However, it became clear over time that existing techniques of intermittent water spraying were inadequate on account of the high rate of moisture absorption and run-off. Continuous spraying was deemed necessary to keep work surfaces sufficiently wet. The expanding use of compressed air equipment, notably for drilling and equipment cleaning, had introduced a further silicosis hazard underground, because it was the compressed air which blew dust into the atmosphere.

⁴⁶ It must be conceded that some of the new production methods were beneficial in that they allowed for the cost-effective mining of low grade ores, extending the life of older mines and permitting the development of previously unprofitable ore veins.

⁴⁷ Gibson, "Current Problems in Dust Control in Metal Mines."

Upon discovering this new problem, compressed air was replaced by water for cleaning functions. It also became necessary to improve the design of compressed air drills to keep the air from reaching the water mists, as this just served to send the wet dust particles into the atmosphere where, wet or dry, they could be inhaled into human lungs.⁴⁸

When dust could not be suppressed, it was considered good practice to isolate it from other working areas. This applied to activities such as dumping and passing, primary crushing, skip loading and dumping, secondary crushing, screening and conveying with belts, and work at chutes and feeders. As an example, dust generated during crushing, screening, and conveying could be confined by tight fitting enclosures around the process. Dusty air within the enclosure was then collected and cleaned with cloth filters. These activities to control dust at the source were necessary because it was very difficult to remove dust particles once they got into the mine atmosphere. Attempts to settle the dust with water sprays were only moderately successful, as the water particles did not always attach to the dust particles, and even when they did, the dust could still enter the lungs. It was believed to be more effective after blasting to wet the rubble to prevent the generation of dust in subsequent handling, than to use water sprays to suppress the dust caused by blasting. While this knowledge about the complexity of the silica hazard was beneficial, specialized research and engineering skills were required to cope with it. For this reason, the discourse on silicosis gained a corresponding technicality that served to isolate laymen, both non-specialist mine managers and mine workers, from the specialists charged with preventing silicosis. This meant that senior managers became less involved in, and knowledgeable about, the silicosis problem in their mines. For its part, labour may have found it even more difficult to have a voice in the silicosis policy debate than previously. The diminished contribution of supervisors and workers to the silicosis debate was compounded by the advances made in dust control. Larger dust particles, which were visible to the human eye, had largely been eliminated by spraying and ventilation. The absence of visible dust often gave non-specialists a false sense of security. If senior managers did not see dust, they bragged about

⁴⁸ G.R. Yourt, "Measurement and Control of Air Contaminants in Ontario Uranium Mines," in Conference on Silicosis and Other Industrial Pulmonary Diseases, ed. McIntyre Research Foundation (Toronto: McIntyre Research Foundation, 1963), 11-13.

the healthy conditions in their mine. If workers did not see dust, they may have assumed there was no need for safety devices and no reason for complaint. This was dangerous because dust of respirable size could not be seen without the aid of a microscope. Microscopic particles were more numerous than larger dust particles, so the absence of visible dust was no guarantee that harder to control microscopic dust was not present. Given this fact, one can imagine the amount of respirable dust in situations in which the dust hazard was visible.⁴⁹

At the same time as discussion and action surrounding silicosis became increasingly technical and dominated by scientists and engineers, labour increased its efforts to improve working conditions in the mining industry by demanding a greater role for itself. Contrary to the assertions of some managers, this was not just an attempt by the union elite to enhance their power and prestige. In the 1950s, as in the 1930s, union organizers used issues of health and safety to attract members with promises not only of better working conditions, but of greater power in the design, implementation, and enforcement of health and safety policies. In its successful raid on the IUMMSW at the Denison Uranium Mine, the United Steelworkers compared its health and safety agenda with the provisions negotiated by Mine-Mill. The Steelworkers proposed a clause committing the company to provide necessary protective clothing and equipment, with the union to assist management in carrying out the programme. The existing agreement gave management the sole right to make changes to safety equipment and practices. The raiders further promised the creation of a twelve person safety and health committee, with six labour and six management representatives. The ideal committee would meet at least once a month, would draw up its own rules and arrange its own inspection tours, and would have all safety records and accident reports available for its perusal. The positions of Chairman and Secretary would rotate between union and company representatives. This contrasted with the existing agreement that did not assign any rights or responsibilities to the joint committee. It was also thought desirable to have the union notified of all accidents in order that the joint safety and health committee could investigate the mishap immediately. This was not in the existing agreement negotiated by Mine Mill. In order to increase the protection of individual workers, the Steelworkers proposed that every

⁴⁹ Ibid., 13-14.

man have the right to refuse to do any work which he considered unsafe, until the task had been reviewed by departmental managers in the presence of a union steward. With the same aim of individual protection in mind, the Steelworkers pledged to make the company solely responsible for safety and health, in order to end management's practice of shifting blame onto workers to absolve itself of responsibility.⁵⁰

The labour movement seemed to place itself in a contradictory position by demanding a greater role for itself and its members in health and safety, while at the same time demanding that companies be solely responsible for these affairs. It can be argued that this awkward position derived from the contradictions in how health and safety programmes were managed. On the one hand, operators were pointed about expressing their right to manage their firms without outside interference. They also noted that the Mining Act gave them responsibility for ensuring a healthy working environment. At the same time, the operators did not always practice what they preached. As the examination of silicosis control shows, the responsibility for protective measures often fell upon individual workers, or else management implemented policies, such as unreasonable production demands, that mitigated the effects of protective measures. Labour was simply proposing that management fulfill its closely guarded responsibilities. On the other hand, the failure of management to adequately carry out its responsibilities fuelled the demands of workers for a greater role in the health and safety field. At the same time, increased supervision and new production processes reduced the autonomy of mineworkers. Instead of shaping the production process, they increasingly followed the instructions of management and line supervisors. This reduced the ability of individual miners to assume responsibility for their own health, even as management blamed workers for failing to use proper dust control techniques. This situation seems to have made miners both reluctant to shoulder responsibility and desirous of increasing their control over the work they performed. One way of fighting corporate control was through health and safety issues. Demands for shared authority over health and safety addressed concerns about workplace control and personal well-being.

⁵⁰ [United Steelworkers of America Health and Safety Proposals for Denison Mines - 1958], AO F1352-1-0-1, OMA Papers, Collective Agreements.

The result of these demands was conflict between management and labour over health and safety. Managers complained that despite their efforts to make mines healthier, compensation rates remained high because employees took less interest in following prescribed practices. The lack of cooperation was largely attributed to the conflicting nature of the employer-employee relationship. However, in companies where an effort was made to actively involve labour in health and safety efforts through joint committees, it was reported that programmes were more successful.⁵¹ This demonstrates that issues of health and safety were intertwined with the general struggle for workplace control - mineworkers rejected top-down policies, but supported ones which they helped design. This could have been because workers simply refused to what the boss told them to do or because practices implemented with employee participation were more practical and better met the needs of those they were designed to protect.

There is evidence that workers in general, while concerned about the threat of silicosis, had a fatalistic view of their occupational risks, which may help explain their reluctance to use burdensome safety devices. One industrial hygienist reported that men who had worked in dust for a long time expected their x-rays to show lung damage. When disease progression was minimal, the employee reportedly became more willing to wear a respirator and follow other health protection measures. Many men were under the impression that they had inhaled so much dust in their careers that there was little point in wearing a respirator. At the same time as he talked about the need to encourage workers to protect themselves, the industrial hygienist also noted that workers were willing and able to offer their own practical suggestions regarding dust hazards. This is treated as a new phenomenon, but it is more likely that workers always had suggestions, only they were never listened to by management. The doctor noted that "workmen notice and appreciate the effort management is putting forth to eliminate dust, and their confidence in the good intentions of the company increases in proportion to the number of promises of improved plant hygiene they see fulfilled."⁵²

⁵¹ Report prepared by Dr. John Swatsky, International Behavioural Consultants Ltd. for the Mines Accident Prevention Association of Ontario, 1968, AO F1352-4-0-1, OMA Papers, MAPAO. More current research on joint committees comes to similar conclusions. See, for example, Wayne Lewchuck, A. Leslie Robb, and Vivienne Walters, "The Effectiveness of Bill 70 and Joint Health and Safety Committees in Reducing Injuries in the Workplace: The Case of Ontario," *Canadian Public Policy / Analyse de Politiques* 22:3 (1996): 225.

⁵² L.E. Hamlin, "Review of Silicosis for the Industrial Hygienist and Medical Practitioner," 54.

The above quote portrays a healthy workplace as one route to industrial peace. It was likely the fear of industrial unrest, brought on by the increased power of labour, that encouraged managers to include working-class representatives in the design and enforcement of health and safety policies. However, this participation was token at best, as working class concerns were only taken into account to the extent that management rights were not infringed upon. The dominance of capital over labour in industrial relations ensured that management maintained its position of leadership in the workplace. Because of this, as the activities of the public sector expanded during the 1940s and 1950s, the labour movement called on the government to become more active in the regulation of workplace health and safety. It was hoped that stricter government regulation would aid labour in its fight for better conditions and greater labour participation in establishing health and safety rules. The argument was that these issues were too important to leave to management alone. Shareholders may have invested their money in the industry, but the miners had invested their lives. It was also hoped that government research resources could be used to study and document the risks involved in everything from new chemicals to aluminum dust therapy. However, the government continued to view occupational health and safety as a matter to be resolved by management and labour in the collective bargaining process. Unfortunately, it was very difficult for labour to make progress on health and safety issues in collective bargaining as long as mining companies, in defense of sacrosanct management rights, refused to grant union demands for joint safety committees, as was the case in Mine Mill negotiations with Inco in 1956.⁵³

In an effort to strengthen its campaign for better working conditions, the national executive board of Mine-Mill decided in 1958 to create a department of Health, Safety, and Welfare to concentrate upon topics falling under these headings. Silicosis was one such topic. While the mining companies were boasting that silicosis was no longer a serious threat to those who worked in the industry, the union argued that it was too early to bury

⁵³ IUMMSW, "Unsafe and Unhealthy Working Conditions," *Mine-Mill Herald* (March 1956): 4. IUMMSW, "Safety Conditions a Matter of Life and Death," *Mine-Mill Herald* (September 1956): 1.

silicosis, given the lack of medical knowledge about the disease and the unknown effects of new mining techniques, such as trackless mining.⁵⁴

In western Canada, union-management safety committees were generally accepted by employers in the mid-1950s. In Ontario (and Quebec), management remained adamantly opposed to increasing the participation of the workforce in establishing a safe and healthy workplace. The IUMMSW argued that labour needed a voice on health and safety issues because many accidents were not caused by worker carelessness, but by the failure of cost-conscious managers to implement proper health and safety measures. Mine Mill believed there were several primary responsibilities for a joint committee: full inspections of all working places and machines, conducted jointly by labour and management representatives; testing of dust and gas levels and their composition; reporting of every accident; recording and publication of all recommendations made by the committee; and recording of the implementation of these recommendations so that blame could be properly assessed.⁵⁵

The long-standing reluctance of management to share its responsibility for health and safety with labour is indicative of the way in which reciprocal concerns over health were sidelined as the prevention of occupational disease and injuries became intertwined with the broader problem of management-labour conflict. The idea that workers and their representatives should participate in corporate health and safety activities was contentious from the earliest days of collective bargaining. In 1949 negotiations between Preston East Dome Mines and Local 100 of the Porcupine Mine Workers' Union, the union proposed the establishment of a joint safety committee.⁵⁶ Along with a demand for the automatic check-off of union dues, the joint committee was a significant sticking point in the negotiations. Both were seen as a union power grab that threatened management rights. Preston East Dome wanted to change the wording of the proposal from "union committee" to "employee committee" to indicate an agreement between the company and its employees. The company argued that the union was certified to represent employees in the bargaining process; it was

⁵⁴ William Kennedy, "Health, Safety, and Welfare Department Set Up By Union," Mine-Mill Herald (February 1958): 2.

⁵⁵ IUMMSW, "Safety is a Matter of Life and Limb," Mine-Mill Herald (June 1957): 9.

⁵⁶ Local 100 was affiliated with the Canadian Congress of Labour and was formed after a split in Local 241 of the IUMMSW. A certification vote of Preston East Dome Mine employees chose Local 100 over Local 241.

not certified to interfere in the operation of the mine. Management did not believe the union had any right to conduct any activity on private company property. By recognizing union representation on the joint committee, the company feared it would be recognizing the right of an outside agency to assist in running the company.⁵⁷

Preston East Dome Mines was not alone in its anti-union intransigence. In 1953, the Ontario Mining Association advised its members that labour-management committees were “just another form in which the Union hopes to secure a position where it can interfere with and influence management in the management of a business.” The brief containing this quote was full of anti-union, Cold War hysteria. A contract clause pledging racial and religious equality was also seen as an infringement on management rights.⁵⁸ Any measure of union security would simply have aided the unions and their party, the Cooperative Commonwealth Federation, in their plan to force the mines out of business.⁵⁹

The gold mines were the most effective segment of the mining industry at fighting off union demands for better health and safety provisions in collective agreements. As of March 1964, eight of the twenty-two gold mines in Ontario were still without joint safety committees. Almost every other mine in the province had some form of joint committee. Only at Dome East Preston and McIntyre mines had the Steelworkers managed to negotiate health specifically into the title of joint committees. Where joint committees did exist, most were employee-management committees, not union-management committees. Only two small gold mines from northwestern Ontario, where silicosis was not a serious hazard, provided their employees with hospital insurance. Every other type of mining but gold offered hospital insurance to its employees.⁶⁰

In some instances, union certification reduced the official role played by employees in setting a company’s occupational health agenda. For example, the Employee Representation Plan introduced by Broulan Mines in 1942 created a Joint Conference

⁵⁷ “Brief Presented by Preston East Dome Mines Ltd., South Porcupine, Ontario to conciliation board in respect to certain matters between Preston East Dome Mines Ltd. And Porcupine Mine Workers Union, C.C.L. Local 100,” [1949], AO F1352-1-0-11, OMA Papers, Collective Agreements.

⁵⁸ By this criteria, the Canadian Charter of Rights and Freedoms is nothing but an infringement on management rights, proof positive that the Libertarian Party of Canada is not irrelevant.

⁵⁹ “Renegotiation of Union Agreements,” [1953], AO F1352-1-0-1, OMA Papers, Collective Agreements.

⁶⁰ “Tabulation of Contents of Labour Agreements as at March 31, 1964,” AO F1352-1-0-1, OMA Papers, Collective Agreements.

between management and workers, in which employees could present grievances and suggestions about health issues such as silicosis prevention. Of course, the company's board of directors could veto any decision of the Joint Conference. When a collective agreement was signed between the Porcupine Mine Workers Union and Broulan in 1950, there was no similar provision for employee representation, as token as it was. However, the benefit of union advocacy likely cancelled out this loss.⁶¹ When operators did concede to union demands for joint safety committees, they negotiated tight limits on their role. In 1969, Aunor Gold Mines finally agreed to a joint committee, but it was limited to an advisory capacity that supplemented and did not interfere with management's existing safety programmes. In addition, no specific references were made to health protection.⁶² In contrast to this was the 1959 collective agreement between Hollinger and the Steelworkers. Article 14 of the agreement concerned both safety and health. The article committed Hollinger to maintain existing safety devices and practices for the purpose of protecting employees from injuries or unhealthy conditions of work. This placed the responsibility for health and safety with management. While management maintained the right to make changes, this section at least gave workers the power to file a grievance in the event that the existing minimum health protection standards were not maintained. In return for this right, employees were committed to conform to the protective practices mandated by the company. Similar articles were in place in uranium mines by the early 1960s.⁶³

Labour not only wanted greater government involvement in regulating workplace conditions, it also sought greater government involvement in silicosis research, which was generally left to the private sector, with limiting consequences. Research conducted privately at the expense of the mining industry focused on the important issues of reducing the incidence of silicosis and evaluating compensated cases, with the goal of reducing

⁶¹ "Broulan Mines Employee Representation Plan," [1942], AO F1352-1-0-4, OMA Papers, Collective Agreements; "Collective Agreement Between Broulan Reef Mines Ltd. and Local 100, Porcupine Mine Workers Union, C.C.L.," [1950], AO F1352-1-0-4, OMA Papers, Collective Agreements.

⁶² "Collective Agreement Between Aunor Gold Mines Limited and the United Steelworkers of America, 1969," AO F1352-1-0-3, OMA Papers, Collective Agreements.

⁶³ "Collective Agreement between Hollinger Consolidated Gold Mines Ltd. and United Steelworkers Local 4305," 19 March 1959, AO F1352-1-0-7, OMA Papers, Collective Agreements; "Collective Agreement Between Dension Mines Ltd. and the United Steelworkers of America, 1 December 1965," AO F1352-1-0-38, OMA Papers, Collective Agreements.

compensation costs. Little or no attention was given to treating men already compensated for silicosis. This bias in the research agenda is reflected in a list of the work done by the Technical Silicosis Research Committee of the Mines Accident Prevention Association in the 1950s and early 1960s: dust measuring equipment, tuberculosis control, chemical analysis of the content of miners' lungs, assessments of compensation costs, statistics on silicosis incidence, progression of silicosis, and developments in other countries.⁶⁴ It is said that an ounce of prevention is worth a pound of cure, but silicotics may have viewed their disease as a medical condition requiring medical intervention, rather than as the engineering problem which industry research focused on.

When the Department of Mines did march onto the health and safety stage, it recited the well rehearsed lines of capital. The measures adopted by the department simply codified the recommendations of the more progressive mine operators. For example, on 1 March 1957, the Department issued a code of requirements for the survey of dust, ventilation, and radioactivity in provincial mines. The code mandated that surveys should include measures of the velocity and volume of ventilating currents, and dust counts obtained by konimetry. These regulations were based on the practices of the Mines Accident Prevention Association. The only official addition to the code was the requirement that such surveys be conducted at least every three months and that the results be available to the engineers of the Department of Mines, but not the people working in dust.⁶⁵ This legislation can be seen as part of the government's support for the maintenance of the voluntary system of health and safety regulation. By legislating the practices of the MAPAO and the progressive employers which supported the work of that agency, the Mines Department assisted the Ontario Mining Association in its ongoing effort to enforce voluntary protective measures throughout the mining industry. This was necessary to fend off strict and potentially expensive health and safety legislation that would tread on the unfettered rights of management.

It may have been just as well that the Department of Mines was not interested in imposing legislation on the industry, as it had enough difficulty enforcing the legislation

⁶⁴ E. R. Olson, "A Cooperative Approach to Silicosis Prevention in Ontario," in Conference on Silicosis and Other Industrial Pulmonary Diseases, ed McIntyre Research Foundation (Toronto: McIntyre Research Foundation, 1963), 4.

⁶⁵ Paterson, Bulletin 158, 22.

requested by the operators. Mine managers were concerned about continually rising compensation costs, but they were more concerned about production levels. For this reason, particularly during the labour shortages of World War II, the Department of Mines was kept busy ensuring that new employees were x-rayed for pulmonary diseases before they were sent to work in dusty environments. A particular problem occurred in remote areas, such as the Red Lake mining district, where there were no chest examining stations and operators used the remoteness to justify the employment of uncertified miners.⁶⁶

The Workmen's Compensation Board, often an advocate of greater protection for workers, was not going to aid the labour movement in its struggle for stricter regulations and more worker involvement in health and safety issues. This was made clear in a 1954 speech by E.E. Sparrow, the chairman of Ontario's Compensation Board. Sparrow noted that even though all industries in which silicosis was a potential hazard were legally compelled to contribute to the silicosis fund of the Board, legislation also recognized that management had the fundamental right to assume responsibility for the safety of its employees. It was argued that provincial employers had accepted this responsibility, as evidenced by the considerable amount of voluntary effort made to prevent accidents and industrial disease, which far exceeded the statutory minimums. Although the WCB collected over \$35 000 000 in employer assessments in 1953, far more than this was spent on prevention. The mining industry in particular was singled out for praise of its voluntary efforts, without which there would have been far more compensable cases than there actually were. One would think that with stricter legislation and greater worker participation, there might have been even fewer cases of injury and disease. Not so, explained Sparrow, as more effort was allegedly put into improving workplace health and safety in Ontario than in jurisdictions where legislation alone was used to bring about improvements.⁶⁷

The more intelligently managed companies, which dominated the Ontario Mining Association, likely believed that they could only count on the Department of Mines to support voluntary regulation as long as it was seen to be effective. Otherwise, it would have

⁶⁶ W O Tower, Chief Inspector of Mines to D F Cooper, Inspector of Mines. 11 August 1941. AO RG13-21-0-36. Department of Mines, Mines Inspection Branch, Silicosis File.

⁶⁷ "Silicosis as Seen by the Ontario Workmen's Compensation Board." Speech by E.E. Sparrow. February 1954

been difficult for the department to resist public and political pressure for protective legislation. For this reason, these companies spent considerable sums on dust control measures. However, many of their corporate peers did not possess the same foresight, as dust suppression measures and ventilation systems were reported to vary greatly from mine to mine. Even though most managers demonstrated an understanding of the need for water spraying and the cessation of work immediately after blasting, konimeter surveys frequently recorded dust counts of over 1000 particles per cubic centimetre and "too many to count," notably in uranium mines. The Steelworkers also reported that ventilation was inadequate in the deeper workings of at least one Porcupine gold mine. As late as 1960, a presentation at an industry sponsored conference recommended that Ontario mines needed to develop better general ventilation plans with greater attention to the distribution of air in the mine, to air temperature, and to removing dusty air from the mine as effectively as possible. The presenter also proposed the more extensive use of konimetry surveys to detect abnormal dust conditions so that they could be promptly eliminated. This clearly indicates that dust hazards were still present in provincial mines and that some managers shunned their designated role as guardians of miners' health.⁶⁸

While many, if not most managers were undoubtedly interested in protecting the health of their workers, capitalism required them to maximize shareholder returns in order to keep their jobs. Since competition rewarded the lowest cost producer, it was necessary to minimize expenditures wherever possible. Expenditures to ensure a healthy and safe working environment were one such cost. Because of this dilemma, it is probable that the only reason the voluntary approach to health and safety succeeded was because it made economic sense, not because management naturally assumed a paternal responsibility for the well-being of its workforce. The threat of high compensation assessments pushed employers to reduce the silicosis hazard as much as possible.⁶⁹ In 1953, gold producers were assessed

⁶⁸ Paterson, Bulletin 158, 23; Brief prepared by W.J. Geldhart, Public and Industrial Relations Ltd. for Jack Beattie, Executive Director, Ontario Mining Association, 14 May 1958, AO F1352-3-0-8, OMA Papers, McIntyre Research Foundation; Campbell, "Some Comments on the Pneumoconiosis Conference held February 9 to 24, 1959." A dust count of 300 particles per cubic centimetre or less was considered good at the time.

⁶⁹ W.B. Dix, President, McIntyre Research Foundation to R.G. McKelvey, Quebec Metal Mines Accident Prevention Association, 1 August 1958, AO F1352-3-0-8, Ontario Mining Association Papers, McIntyre Research Foundation.

\$2 for every \$100 of payroll to cover the cost of compensating silicosis. The total value of assessments collected from the mining industry in that year was \$949 000. This pushed the silicosis account maintained by the WCB to \$2 million, but still left an unfunded liability of \$1.5 million. In 1953, the average total cost of compensating a silicotic was \$12 000. Four years later, mineral producers were assessed a total of \$1 250 000. In 1957, McIntyre initially was to pay \$110 000 into the silicosis fund, but by the end of the year, the company had paid \$130 000. It was revealed that the cost of compensating cases of silicosis was rising on account of ever more cases coming to light; the increase in benefits to cover 75 percent of a miner's lost income; the 75 percent rise in miners' wages over pre-war times; and the longer life expectancy of silicotics, which beginning in 1958 required capital charges to be estimated on the basis of a ten year life expectancy instead of five years. As the number of gold producers declined, the remaining companies had to shoulder the costs of their defunct competitors. For these reasons, in the late 1950s, Ontario's gold mining companies began to warn of an approaching crisis situation.⁷⁰

In an act of wisdom, the Department of Mines decided to verify the claims of the mining industry that they had done all that was feasibly possible to control silicosis. In December 1957, Dr. John F. Paterson was appointed by the Minister of Mines to review the silicosis situation in Ontario's mines. The associate professor of medicine from the University of Toronto made visits to Porcupine, Kirkland Lake, Sudbury, and Elliot Lake. He found the situation satisfactory at the first three camps, but expressed concern about conditions at Elliot Lake.⁷¹

Discussing the development of silicosis in miners, Paterson outlined a variety of factors that could influence the development and progress of the disease. These factors fell into two broad categories: characteristics of the dust inhaled and characteristics of the individual miner. The silicosis hazard varied with the features of the dust, such as particle size, settling velocities, the percentage of free silica in the air, and the way in which silica

⁷⁰ "Silicosis as Seen by the Ontario Workmen's Compensation Board," Speech by E.E. Sparrow, February 1954; Angus D. Campbell, Board of Directors, McIntyre Research Foundation to W.B. Dix, President, McIntyre Research Foundation, 3 July 1958, AO F1352-3-0-8, Ontario Mining Association Papers, McIntyre Research Foundation.

⁷¹ Memorandum from Dr. John F. Paterson to J.W. Spooner, Minister of Mines, 28 March 1958, AO RG13-6-2-39, Department of Mines, Silicosis.

mixed with other dusts from the orebody, including radioactive dust generated in uranium mines. Another important element involved the variations of individual miners. A person's employment history was important in determining whether or not he would develop silicosis. Variables included the age at which dust exposure began, the length of time and intensity of dust exposure, the specific occupations of a man working in dust and the length of time he held these different jobs, and the different mines and mining camps worked in over an individual's career. Obviously, the longer a miner was exposed to dust and the higher the concentration of silica dust inhaled, the greater was the possibility that he would develop silicosis. The general health of miners also influenced the chance that silicosis would develop. Those exposed to pulmonary tuberculosis through crowded living conditions or residence in a community with a high rate of tuberculosis were more likely to get the disease than those not exposed to tuberculosis. A lowered resistance to tuberculosis from factors such as "racial susceptibility" and malnutrition were thought to further increase one's chance of contracting silicosis. In addition to tuberculosis, the presence of other respiratory diseases increased a person's risk level. Illnesses such as asthma, recurrent pneumonia, and tobacco effects could alter the quantity of silica inhaled and retained in the lung. For the same reason, mouth breathers were also believed to be at higher risk of contracting the disease. Some individuals were also considered to be more sensitive to silica dust than the average person. Paterson's factors are interesting because they reflect the view of the mining industry that many silicosis cases resulted from individual characteristics, not an unhealthy working environment. However, Paterson viewed dust variations as more important than individual physiology, which the industry did not always do in its efforts to pass responsibility from corporate to individual shoulders.⁷²

In his final report, Paterson made numerous recommendations to ameliorate the situation. In order to protect workers against unjust dismissal, he advised that the examination results of a miner continue to remain confidential between the miner and the WCB medical officer. Employers were only to be notified of a man's results if he had tuberculosis, a condition which required a miner to leave his employment. In a reflection of the medical profession's effort to establish a role for itself as a neutral occupational health

⁷² Paterson, Bulletin 158, 4.

advisor to management and labour, it was recommended that the medical officers of the Miners' Chest Examining Stations be appointed as district medical advisers in pneumoconiosis in order to increase their role in providing assistance to management and labour on silicosis. It was hoped such status would lead to greater consultation between the two parties and the medical officers. This proposal was not implemented.⁷³

While Paterson praised many of the advances made by engineers to combat dust hazards, it was noted that many of the advances in mining designed to increase production efficiency actually increased the production and dispersal of dust. Paterson found little basis for the claims of management that dust levels in mines had decreased significantly since the 1930s. This was because dust surveys were rare in the 1940s. Until the middle of the 1950s, dust counts had been confined to spot checks in locations where high concentrations were expected. Despite the paucity of information, Paterson reported on evidence that dust levels had actually increased underground in certain parts of mines in the 1940s and early 1950s. It was not until the late 1950s that dust concentrations dropped below the levels of the early 1940s. The rise in dust concentrations was attributed to technological change. Ventilation systems and dust control measures were not upgraded to keep pace with new productive equipment such as mechanical slushers and loaders, and drills with higher speeds. In addition, the increased depth and breadth of mining operations created new challenges in the design of ventilation systems. For these reasons, Paterson argued that the effectiveness of ventilation systems be evaluated on the basis of fresh air flowing to work sites, instead of just on the capacity of the fans to send fresh air into the mines.⁷⁴

The failure to obtain satisfactory dust levels in a mine was attributed to engineering, economics, and human nature. The fault was seen to lie with both management and labour. Management was supposedly more concerned with raising ore than with providing infrastructure for water spraying and ventilation. It was reluctant to halt production in order to extend ventilation facilities to the working face, where it was most necessary. For their part, miners were naturally more interested in earning substantial bonuses than in ensuring that dust was adequately suppressed. Spraying simply reduced the amount of paid labour a

⁷³ Ibid., 19. Paterson, Bulletin 173, 11.

⁷⁴ Paterson, Bulletin 158, 3, 19, 21.

man could perform. Immediate economic concerns took precedence over future health problems that might ever develop. Without strict supervision, it was impossible to ensure miners practiced all the procedures designed to control dust levels and that also slowed the pace of work: water spraying, the use of uncomfortable respirators, the closing of ventilation doors.⁷⁵ The solutions to these problems, to which Paterson was oblivious, seem obvious. To ensure that rapid production did not occur at the expense of workers' health, legislation could have been introduced prohibiting the start of productive mining until effective ventilation had been installed throughout the mine. To ensure that miners did not suffer economically as a result of dust control measures, the bonus system could have been replaced by a higher standard wage or the production expectations placed on individuals could have been reduced. The inclusion of miners in the development of silicosis prevention programmes would have not only increased the workforce's awareness of the dangers of dust, but might have produced suggestions for dust control that were not such a burden on the individual miner. Miners may also have been more willing to utilize protective measures they had a role in designing than those imposed from above. As added security that dust control measures would be practiced, legislating them into the Mining Act with fines for disobedience would have forced companies to meet minimum standards and would have provided workers with an economic incentive to use the measures intended for their protection.

Paterson did not feel that human frailties provided an excuse for failing to prevent silicosis. He felt that both management and labour had clear reasons for controlling dust hazards. Management had the moral responsibility for the welfare of its workforce. More compellingly, managers had a financial responsibility to their shareholders to prevent silicosis, due to the high cost of the disease. In 1958, Ontario mines paid \$2 270 209.65 into the silicosis fund managed by the Workmen's Compensation Board. Gold producers contributed \$3 for every \$100 of payroll and uranium producers contributed \$2 for every \$100 of payroll. If these significant costs were allowed to rise by permitting the incidence of silicosis to increase, some high cost mines risked becoming uneconomical. In a vicious circle, the closing of these mines would then increase the proportionate share of silicosis

⁷⁵ Ibid., 24.

costs borne by the remaining producers. For their part, miners had an interest in preventing silicosis to avert severe physical suffering in later years. The trick was to educate workers of the risk, so they would lose their optimistic view that other miners would contract silicosis, rather than themselves.⁷⁶ The reasons given by Paterson for management and labour to be interested in preventing silicosis described a contradictory situation in which mining companies had an economic interest in dust control, while the bonus system ensured that the economic interest of miners was in conflict with certain dust control measures. Instead, miners had an economic interest in taking risks with their health. This helps explain the seemingly strange situation of miners resisting dust control measures introduced to protect their health.

In spite of the uneven record of management efforts to control the dust that caused silicosis, Paterson endorsed the voluntary compliance system in place in Ontario to reduce occupational health and safety hazards. He argued that there were two ways to further preventive efforts: education and responsibility or inspection and prosecution. The latter method was seen as alien to a free and democratic society such as Canada. Continuing efforts to increase the education and responsibilities of both management and labour were seen as the more appropriate response to the situation in Ontario. Praise was given to the voluntary efforts of management to cooperate with the MAPAO in engineering an end to silicosis. The results of this voluntary and cooperative relationship were described as among the most important factors in bringing silicosis under control in provincial mines. Unfortunately, there was no way under the then current system of forcing recalcitrant companies to follow the industry's guidelines. Paterson seemed to realize this when he noted that the conditions in uranium mines threatened to reverse the progress made in decreasing the incidence and severity of silicosis.⁷⁷

The Silicosis Committee of the Mines Accident Prevention Association was seen by Patersons as central to the continuing efforts to educate management about silicosis. Scientific conferences such as those run by the industry-sponsored McIntyre Research

⁷⁶ Ibid.

⁷⁷ Ibid., 25.

Foundation received accolades for disseminating knowledge and facilitating discussion between various silicosis researchers and industry representatives.⁷⁸

For the Mines Accident Prevention Association and Dr. Paterson, increasing the responsibility of labour seemed to mean a stricter observance of work rules established by management. With this end in mind, the MAPAO produced a pamphlet in 1958 addressed to "Mr. Miner," advising him how to control dust. The measures included the use of spraying devices to avoid dry drilling; blasting at the end of the shift, and the use of water sprays when blasting; keeping materials moved in mucking and scraping wet at all times; closing the doors at dumps and ore passes when not in use to prevent the dispersal of dust; following the instructions posted on ventilation doors; keeping the ducts of auxiliary vents as close to the working face as possible; using a respirator properly when supplied with one.⁷⁹ To the MAPAO's credit, these were all sensible and widely accepted dust control measures. What the recommendations did not do was address the reasons why these common-sense measures were not always practiced.

The Committee on Silicosis of the Mines Accident Prevention Association deemed it necessary to prepare a response to the recommendations of the Paterson report.⁸⁰ The Committee on Silicosis was in agreement with many of the recommendations, notably those in support of continuing existing procedures, which the industry had played a major role in shaping. These included the chest examinations of miners before and during employment, as they served to reduce potential compensation liabilities. Disagreements were mostly over recommendations for minor procedural changes and proposed encroachments on management rights. For example, Paterson had recommended the Department of Mines establish a code of requirements for periodic surveys of dust and ventilation, to be undertaken not less than every six months in mines with no radiation hazard. The Committee on Silicosis agreed that regular surveys should be conducted, but felt such surveys should continue to be done on a voluntary basis. The proposal to broaden the duties

⁷⁸ Ibid.

⁷⁹ Ibid.

⁸⁰ The response was prepared by R.J. Beggs, Kerr-Addison Gold Mines; A.D. Campbell, Consultant to the Committee on Silicosis; H.E. Rudd, MacLeod Cockshutt Gold Mines; E.W. Todd, Consultant to the Committee on Silicosis; W.S. Maguire, Sylvanite Gold Mines.

of medical officers so they could better assist management and labour was objected to on the grounds that the medical officers only had experience with part of the silicosis problem. It was thought guidance would be better given by an agency possessing the results of studies by doctors, the WCB, and industry associations. Surprisingly, the Committee on Silicosis opposed a recommendation that a Pneumoconiosis Research Unit be established to delve into the many unsolved problems involving industrial pulmonary diseases. There may have been a fear that the industry would have to help finance such an institute or there could have been a reluctance to relinquish the industry's research leadership to a neutral body. The committee members agreed with Paterson that ventilation systems should deliver fresh air to the working face and be judged for effectiveness on that basis.⁸¹

In November 1969, Allan Lawrence, Ontario's mining minister, contracted Dr. John F. Paterson to bring his 1959 report on silicosis up to date. In his 1973 report, Paterson stated that "[p]neumoconiosis in the hardrock miners of Ontario has gradually decreased as a hazard since it was discovered to be one in 1926. The exception to this is in Elliot Lake uranium miners."⁸² It was hoped that continued improvements in dust control and ventilation would see the incidence of silicosis decline further - a familiar refrain in the post-war era for which the reality never matched the expressed optimism. Because tuberculosis remained higher among mine workers than other industrial workers, it was deemed wise to continue the programme of annual chest examinations necessary to hold a miners' certificate. It was recommended to continue with a relatively new method of treating individual cases of silicosis and non-active tuberculosis - chemoprophylaxis. The report ended with a call for continued vigilance against high dust levels. Silica dust was as hazardous as always and a relaxation of efforts could lead to the reemergence of the disease as a major health threat to provincial mineworkers.⁸³

⁸¹ Paterson, Bulletin 173, 16-25

⁸² Ibid., 13.

⁸³ Ibid., 13-15.

Fighting Dust with Dust: Aluminum Therapy and the Monopolization of Knowledge about Silicosis

Labour not only wanted greater government involvement in regulating occupational working conditions; it also sought greater government involvement in silicosis research, which was generally left to the private sector. Unions called for more research on silicosis because they believed the main difficulty their members had in winning compensation cases was disagreement among medical practitioners with regards to whether or not a man had silicosis and if present, whether or not it was disabling. Given the links between silicosis and various other ailments, more knowledge was also desired on the effect of silicosis on the heart and other organs.⁸⁴

Silicosis research in Canada, however, was left to the private sector. As a result, the scientific investigations conducted at the expense of the mining industry concentrated on ways of arresting or slowing the development of silicosis. It was hoped that such research would result in lower compensation assessments. Labour's research agenda, designed to increase the number of silicotics eligible for compensation, was largely ignored. Despite the corporate rhetoric about "Big Labour", unions could not afford to finance their own programme of scientific research. Disease prevention was the best cure, but in the absence of such a resolution, it was important to understand the effect of an illness on the human body. The industry's research efforts paid off with the discovery that a form of aluminum dust slowed or prevented the development of silicosis in animals. The McIntyre Research Foundation was created to promote aluminum therapy and to sell it around the world. The activities of the Foundation became dominated by the promotion and sale of its aluminum powder, activities supported by the suppression of dissident scientific opinions and the publicizing of favourable research. The McIntyre Foundation also became a vehicle to promote the views of the Ontario mining industry with regards to the effectiveness of voluntary regulation and the importance of protecting the unfettered right of management to cope with health and safety issues. Gaining legitimacy from its non-profit, scientific status, the McIntyre Research Foundation deviated from its well-intentioned origins of preventing

⁸⁴ Les Walker, "Willow Chest Centre for Silicosis Research," Mine-Mill Herald (November 1957): 5.

silicosis into an instrument for the monopolization of scientific and political knowledge about silicosis. Through the McIntyre Foundation, capital attempted to establish firm control over the silicosis controversy.⁸⁵

Perhaps the most publicized and controversial development in the control of silicosis was the 1943 introduction of aluminum dust therapy into the mines of Ontario. In the late 1930s, J.J. Denny, a research engineer and mill superintendent with McIntyre Porcupine Mines, undertook research to develop a deterrent to the toxic action of silica dust in lungs. Denny was assisted in his research by Dr. W.D. Robson, McIntyre Mines' medical officer, and by Dr. Dudley A. Irwin, a member of the research staff at the University of Toronto's Banting Institute, which was undertaking research on silicosis prevention on behalf of the Ontario Mining Association. It was found that when metallic aluminum powder was added to quartz in the lungs of rabbits, silica dust was prevented from dissolving into the silicic acid which damaged the lungs. These findings were presented in June 1937. At this point, the Ontario Mining Association agreed to help McIntyre finance a study by the Banting Institute on the applicability of treating humans with aluminum dust. In 1939, an experimental clinic was established in the Porcupine by several local operators to provide aluminum treatment to volunteers with silicosis. Additional experiments regarding the effect of aluminum dust on tuberculosis were finished in 1941. In 1943, the Silicosis Research Committee recommended to the OMA that aluminum therapy for the prevention of silicosis and the halting of the disease's progression be commenced quickly. However, some of the professional medical employees of the mining companies wanted a test period in which aluminum powder would be administered to some employees, while another control group would not receive the treatment. This would not only provide evidence about the effectiveness of the therapy, but determine if the inhalation of aluminum dust had any harmful side effects. The problem was that silicosis took fifteen to twenty years to develop and a controlled study would delay the commencement of aluminum therapy indefinitely. The concerns of the medical profession were overridden by senior managers who wanted to commence the use of aluminum as quickly as possible in the hope that it would reduce the

⁸⁵ A similar corporate body, the Air Hygiene Foundation, existed in the United States in the 1930s. See Rosner and Markowitz, Deadly Dust, Chapter 4.

incidence, severity, and cost of silicosis. Aluminum therapy was first used at the McIntyre Mine in Porcupine and by 1944 it had been adopted by all the operators in Porcupine and Kirkland Lake. By the 1950s, the employees of many of the mining companies across Canada treated their employees with aluminum dust to deter the development of silicosis. The entire cost to the industry of research into the use of aluminum as a prophylaxis against silicosis was \$311 500. In order to recoup this investment, it was necessary to implement aluminum therapy in the hope that it would reduce compensation costs.⁸⁶

The employees of the Ontario mining industry served as guinea pigs for a method whose potential to do good or harm was, at best, uncertain. Fortunately for the proponents of aluminum dust, the IUMMSW was weakened at the time of introduction by its crushing defeat in the 1942 Kirkland Lake gold miners' strike and was able to offer little criticism or resistance to the use of an untried treatment on its members. The unproven benefits of aluminum therapy may explain the very quiet commencement of treatments. The Department of Mines, the Department of Health and the Compensation Board were never officially informed that aluminum therapy in mine change rooms had commenced, which was unusual given the industry's tendency to trumpet its untiring efforts to voluntarily combat silicosis. Eventually, the McIntyre Research Foundation presented a brief to Premier George Drew and the minister of mines in 1945 describing the discovery of aluminum therapy and requesting an official investigation into its effectiveness. Even these briefs were low-key about the already widespread use of aluminum dust in the mines.⁸⁷

If the McIntyre Research Foundation was low-key about the use of aluminum, its approach to marketing metallic aluminum dust was not. The reason the Foundation approached the government about its product was to win official approval of its use. Potential purchasers of metallic aluminum dust outside of Ontario were hesitant to invest in a product that was not endorsed by the Foundation's own government. It was felt that the endorsement of the provincial government would boost sales of the homegrown McIntyre Aluminum Powder. Leslie Frost, the Minister of Mines, was severely criticized by

⁸⁶ Parkinson, "The Prevention of Silicosis in Ontario Mines", IUMMSW, "Aluminum Dust," Mine-Mill Herald (December 1955): 8. Paterson, Bulletin 173, 2.

⁸⁷ W.D. Robson, McIntyre Research Foundation, "Brief on Silicosis and Aluminum Therapy," 1 November 1945, AO RG13-13-0-48, Department of Mines, Central Registry Files.

representatives of the McIntyre Foundation for his delay in commencing a long-promised investigation into aluminum therapy.⁸⁸

Frost appointed Dr. G.E. Hall, the dean of medicine at the University of Western Ontario, to conduct the investigation. Hall's 1947 report officially informed the Department of Health about the widespread practice of aluminum therapy. Hall did not endorse aluminum therapy, nor did he recommend its immediate cessation. He reported that metallic aluminum therapy prevented or slowed the development of silicosis in the lungs of rabbits. No evidence was found to suggest that metallic aluminum dust was harmful to human health or that it increased susceptibility to tuberculosis. Hall only advised that the therapy be discontinued if the inhalation of aluminum dust was found to be harmful in any way. To this end, he recommended further joint studies by government and industry to better evaluate the benefits and risks of metallic aluminum to humans, using control groups, even if they were just historical control groups. These studies never took place. Based on Hall's report, the government allowed aluminum dusting to continue without officially endorsing it.⁸⁹

As time progressed, it remained impossible to assess the impact of aluminum prophylaxis on silicosis rates, as the therapy was introduced at the same time as ventilation, dust control, and tuberculosis prevention were all improving rapidly. New cases of silicosis were already in decline. In any event, by April 1973, only 25 cases of silicosis had been reported in miners whose careers had begun after the widespread use of aluminum started in April 1944.⁹⁰

Despite the enthusiasm with which mine managers embraced aluminum as a prophylaxis, the various professional and government bodies of North America were reluctant to endorse the unproven treatment. Industrial hygienists were reluctant to support the inhalation of aluminum because of concern that it would tend to undermine the more

⁸⁸ Balmer Neilly, Director, McIntyre Research Foundation to Leslie Frost, Minister of Mines, 3 December 1947, AO RG13-13-0-48, Department of Mines, Central Registry Files; Balmer Neilly, Director, McIntyre Research Foundation to H.C. Rickaby, Deputy Minister of Mines, 30 April 1947, AO RG13-13-0-48, Department of Mines, Central Registry Files.

⁸⁹ Laurel Sefton MacDowall, "Remember Kirkland Lake": the History and Effects of the Kirkland Lake Gold Miners' Strike, 1941-42 (Toronto: University of Toronto Press, 1983), 216-18; G.E. Hall, "The Use of Aluminum in the Treatment and/or Prevention of Silicosis," Unpublished report to the Minister of Mines, 15 April 1947, AO RG13-13-0-48, Department of Mines, Central Registry Files, 1, 4, 6-10.

⁹⁰ Parkinson, "The Prevention of Silicosis in Ontario Mines"; IUMMSW, "Aluminum Dust," 8; Paterson, Bulletin 173, 2, 12-13. These figures do not include the new form of pneumoconiosis diagnosed in uranium miners.

complex and expensive engineering and medical controls of silicosis. In the United States, increasing concern about silicosis led to demands from high risk industries for the implementation of aluminum therapy. As a result, in 1945, several conferences were held at which were represented the McIntyre Foundation, the Industrial Hygiene Foundation, the Council on Industrial Health, and the Council on Pharmacy and Chemistry of the American Medical Association, and several other interested parties. A three point memorandum was agreed upon which reserved judgement on the efficacy of aluminum therapy in humans until scientifically controlled, long-term data was available; which raised concerns about increasing a person's susceptibility to tuberculosis and emphasized that aluminum was no replacement for dust removal; and which recommended against the general use of aluminum therapy in workplaces until carefully controlled experiments showed it to be effective in preventing or alleviating silicosis in humans.⁹¹ Until the scientific uncertainty was resolved, Ontario's Compensation Board also assumed a neutral position on the use of aluminum therapy as a prophylaxis against silicosis. Its standard line was that it had no specific evidence that aluminum therapy prevented silicosis nor that it was harmful.⁹²

The contradictory research regarding aluminum dust therapy was a long-running concern of the IUMMSW. This concern was heightened when several American researchers found evidence suggesting that aluminum dust weakened the resistance of individuals to diseases other than silicosis. In 1955, the union passed a resolution at its convention in Rossland, British Columbia calling on the federal government to undertake an intensive study of the effects of aluminum dust on humans. The federal Department of Health responded that such a study was a provincial responsibility. In turn, the union pointed out that it seemed more effective to have one national study instead of numerous provincial ones. It wanted the study to be carried out under the auspices of the National Research Council. There is no evidence that such a study ever took place. It is curious that the federal

⁹¹ A.J. Lanza, "Aluminum Therapy in the Prevention of Silicosis," in Industry, Tuberculosis, Silicosis, and Compensation - A Symposium, ed. Leroy L. Gardner (New York: National Tuberculosis Society, 1945), 95.

⁹² E.E. Sparrow, Chairman, WCB to W.B. Dix, President, McIntyre Research Foundation, 2 September 1958, AO F1352-3-0-8, OMA Papers, McIntyre Research Foundation.

government was willing to tread on provincial territory when it came to the development of mineral resources, but not when it came to issues of working-class health.⁹³

Although it recognized that aluminum dust therapy slowed or prevented the development of silicosis, the United Steelworkers of America blamed the dust for causing other damage to the bodies of its members, paving the way for tuberculosis to develop. Timmins had the highest tuberculosis rate of any city in Ontario, and the union blamed this on the use of aluminum powder by all the mining firms of the area. The union reported that the United States and Australia had discontinued using aluminum dust therapy on account of the alleged tuberculosis risk.⁹⁴ In its effort to stop aluminum therapy until more was known, the Steelworkers were encouraged by medical opinions that “no dust was good for the lungs.” It was argued that if the mechanisms for expelling dust from a man’s lung were damaged, for example from accumulations of silica dust, they were unable to remove any new dust sent into the lungs, including aluminum dust. It was deemed harmful and criminal for management to force unnecessary dust into a man’s lungs when he could not expel it. In addition, because accumulations of dust in the lung were considered to promote increased susceptibility to disease, it seemed logical that accumulations of aluminum dust would have the same effect. The union thus took the position that when the safety of a safety measure was in doubt, its use should be suspended until more conclusive scientific evidence was available.⁹⁵ The official position of the Steelworkers was that aluminum therapy should be discontinued immediately and that management deserved emphatic criticism for making aluminum therapy virtually mandatory despite inconclusive evidence regarding its benefits and risks. The only silicosis prevention measure proven to be effective was ventilation and dust control.⁹⁶

⁹³ IUMMSW, “Aluminum Dust,” 8; IUMMSW, “Legislative and Political Action,” *Mine-Mill Herald* (February 1956): 7. The federal government has always maintained a department with responsibility for mineral exploration, most notably the Geological Survey of Canada. It also assumed responsibility for uranium mining in the 1950s.

⁹⁴ “Unpensioned Miners Fund Established by Steelworkers,” *Timmins Press* (28 September 1954), Press clipping located in AO F1352-3-0-6, OMA Papers, McIntyre Research Foundation.

⁹⁵ “The Seminar,” *Northern Local Union News* (July 1955), Press clipping located in AO F1352-3-0-8, OMA Papers, McIntyre Research Foundation.

⁹⁶ Brief prepared by W.J. Geldhart, Public and Industrial Relations Ltd. for Jack Beattie, Executive Director, OMA, AO F1352-3-0-8, OMA Papers, McIntyre Research Foundation.

Even though the government of Ontario did not officially endorse aluminum therapy, its sympathies clearly lay on the side of management. When an article reflecting the critical views of the Steelworkers towards aluminum therapy appeared in the 29 November 1954 edition of the Timmins Press, the executive director of the Ontario Mining Association wrote P.T. Kelly, the Minister of Mines, urging him to address the controversy in order to head off an expected opposition campaign against the therapy. At the request of the OMA, the minister of mines jumped quite high. In a statement to the Legislature, the minister responded to the criticisms of the Steelworker representative outlined in the article. Kelly started by praising the apparent success of dust control measures implemented in provincial mines and noted the important role of the McIntyre Foundation in this success. He then cited scientific evidence attesting to the effectiveness of aluminum therapy, neglecting to mention that these studies were conducted on animals. Numerous reports were cited refuting the dangers of aluminum therapy and it was pointed out that even though Timmins had the highest tuberculosis rate in the province, a few years previous that dubious distinction had been held by the south-eastern town of Cornwall. Much of Kelly's information and argument came from a briefing prepared for him by the OMA.⁹⁷

While mine managers surely took no pleasure in reports that aluminum dust increased tuberculosis, they had a financial disincentive to cease using aluminum given its supposed role in reducing the incidence of silicosis among mineworkers. This was because the companies were responsible for paying silicosis compensation, whereas tuberculosis costs were borne by the public purse. They also received peace of mind by assurances from the Compensation Board that it would accept responsibility on behalf of all the mines should aluminum therapy prove harmful to miners' health. Dr. Hall's 1947 report and the government's toleration of aluminum therapy were believed to absolve the industry and the Foundation of liability for any harm caused by aluminum dust. In the face of studies showing aluminum dust increased susceptibility to tuberculosis, the promoters of aluminum therapy were taking measures to protect themselves from litigation.⁹⁸ Yet the recommendation of

⁹⁷ N.F. Parkinson, Executive Director, OMA to P.T. Kelly, Minister of Mines, 28 February 1955, AO RG13-13-0-53, Department of Mines, Central Registry Files. Copy of a statement made in the Legislature by P.T. Kelly, Minister of Mines, [1955], AO RG13-13-0-53, Department of Mines, Central Registry Files.

⁹⁸ Letter from A.D. Campbell to N.F. Parkinson, 7 September 1955.

Dr. Hall that the use of aluminum be stopped should evidence show it to be harmful was disregarded by both the industry and by legislators. It was okay to gamble with the health of workers so long as there would not be any negative financial consequences for the industry.

To counter the negative publicity, the McIntyre Foundation went to considerable effort to promote aluminum therapy as an essential aspect of any silicosis prevention programme. The Foundation put considerable effort into marketing its product, creating sales opportunities and deriving considerable goodwill from its status as a non-profit research body.⁹⁹ Using the pretext of its mandate to promote silicosis prevention programmes, the Foundation created a variety of promotional opportunities. One of the most high profile promotional forums for aluminum therapy was the annual silicosis conference of the McIntyre Research Foundation. The first conference was held in 1946 and subsequent conferences were held annually thereafter well into the 1960s. The Foundation's conferences brought together silicosis researchers and industry representatives from around the world, although most were from North America and particularly Ontario. Because of the Foundation's close affiliation with the Ontario Mining Association and the Mines Accident Prevention Association, it was easy to find presenters willing to plug McIntyre Aluminum Powder. All the papers presented at the 1949 conference dealt with the benefits of aluminum therapy as part of a successful silicosis prevention programme in mines and factories.¹⁰⁰ Another favourable presenter was board member Angus Campbell. His 1956 presentation on the history of silicosis prevention at the McIntyre Porcupine Mine noted the conclusive role of aluminum powder in preventing the disease, even though few neutral sources supported this conclusion. These marketing efforts seem to have been relatively successful, as

⁹⁹ The financial statements of the McIntyre Research Foundation suggest its activities came to be dominated by the defence and promotion of aluminum therapy at the expense of other research activities. For example, in 1951, over \$31 000 was transferred to the reserve for research, but only \$1 857.76 was spent on the vague category of "Laboratory Work," compared with the \$27 868.82 expended on the various expenses of operating the Foundation. This ratio of expenditures was similar throughout the 1950s. Figures from the Annual Report of the McIntyre Research Foundation, 1951, 5, AO RG13-13-0-52, Department of Mines, Central Registry Files.

¹⁰⁰ J.W.G. Hannon, Preface to Conference on Silicosis and Aluminum Therapy (Toronto: McIntyre Research Foundation, 1949), 5-6.

McIntyre Aluminum Powder was used across Canada and the United States, in Mexico, Chile, Australia, and elsewhere.¹⁰¹

In its efforts to create a consensus surrounding aluminum treatment, union representatives were invited by the McIntyre Foundation to attend its conferences. The message of McIntyre that aluminum therapy was no substitute for dust control coincided nicely with the position of labour unions. Labour also supported pre-employment examinations and regular chest x-rays for the early detection of silicosis, so long as workers were informed of the results and compensated adequately. Lukin Robinson, the Canadian Research Director for Mine Mill, was encouraged by the consensus of the presentations at the 1956 conference that aluminum dust gave added protection against silicosis.¹⁰² The absence of criticism of aluminum therapy at the conference was bound to leave members of the audience with such a favourable view, which was the desired effect.

The McIntyre Research Foundation promoted its aluminum dust therapy in the same manner a commercial firm would have promoted its products. It organized conferences to promote aluminum therapy under the guise of general silicosis conferences. The lack of adequate government funding for silicosis research meant that there were few academic conferences for those in the field to gather at and present their latest findings. By sponsoring an annual silicosis conference to fill this void, the McIntyre Foundation was able to attract the world's leading silicosis experts, eager for an opportunity to meet with other experts and mingle with representatives of industry. Unlike academic conferences, a call for papers was not issued. A list of potential presenters was prepared and invitations were sent out. In this way, aluminum therapy dissidents were not present at these gatherings of influential people. This gave McIntyre considerable influence over what new research was discussed at the conferences. The gatherings further served as a chance to refute, unchallenged, research questioning the proclaimed benefits of aluminum therapy. For example, Dr. Vorwald of the Saranac Institute in New York State found that aluminum dust slowed the progression of silicosis, but did not prevent it. The Foundation's response was to invite the director of the

¹⁰¹ Angus D. Campbell, "Prevention of Silicosis at the McIntyre Porcupine Mine, Schumacher, Ontario." Paper presented at the Conference of the McIntyre Research Foundation, 22-24 October 1956, AO RG13-20-0-93. Department of Mines, Mines Inspection Branch - Reports, Papers, and Proceedings

¹⁰² Lukin Robinson, "Dust Control the Best Protection," Mine-Mill Herald (November 1956): 7.

Saranac Laboratory, G.W.H. Schepers, to refute the findings not only of Vorwald, but of several other studies pointing to a link between aluminum and tuberculosis. With Scheper's endorsement, McIntyre continued to maintain that its powder prevented the formation of silicosis, even though it had nothing but theoretical chemistry and inconclusive statistics to support its argument.¹⁰³

By attracting leading silicosis experts to its conferences, the Foundation was able to attach an air of authority to its product. Invitees from the American Medical Association were impressed enough with the proceedings to want to publish some of the papers in the Journal of the American Medical Association.¹⁰⁴ Such coverage served to spread the Ontario mining industry's views on silicosis prevention and aluminum therapy. Without a similar high-profile stage, aluminum skeptics were shut out of the debate. In another example, in 1958, the Foundation was trying to organize a symposium on silicosis to be attended by "authoritative speakers" for the mining operators of northwestern Quebec to "bring them up to date on developments in the field." In reality, this was a thinly disguised sales conference. It was hoped that the symposium would give the operators a chance to ask questions they had concerning silicosis, particularly on the role of "aluminum therapy in its prevention." The symposium was also felt to be a good opportunity for the younger supervisors to familiarize themselves with the work of the Foundation.¹⁰⁵

The McIntyre Research Foundation was also quite aggressive in pursuing new markets for aluminum dust. It wasted no time in establishing its presence and developing a positive relationship with potential customers. When the production of uranium began in Ontario in the late 1950s, the Foundation sent two researchers to Elliot Lake, where the industry was concentrated. Under the guise of the Foundation's mission to study silicosis,

¹⁰³ G.W.H. Schepers, "Residual Problems Relating to Pneumoconiosis." Paper presented at the Conference of the McIntyre Research Foundation, 22-24 October 1956, AO F1352-3-0-16, OMA Papers, McIntyre Research Foundation; N.F. Parkinson, Executive Director, OMA to Dr. J.W.G. Hannon, McIntyre Research Foundation, 31 July 1952, AO F1352-3-0-5, OMA Papers, McIntyre Research Foundation. An example of McIntyre's doggedness can be found in a letter from C. Gibson, Chief Engineer and Secretary, Committee on Silicosis, MAPAO to R.F.A. Thew, Safety and Training Director, Steep Rock Iron Mines, 12 June 1951, AO F1352-3-0-3, OMA Papers, McIntyre Research Foundation.

¹⁰⁴ Walton Van Winkle, Secretary, Therapeutic Trials Committee of the Council on Pharmacy and Chemistry of the American Medical Association to Dr. J.W.G. Hannon, McIntyre Research Foundation, 6 February 1950, AO F1352-3-0-4, OMA Papers, McIntyre Research Foundation.

¹⁰⁵ W.B. Dix, President, McIntyre Research Foundation to R.G. McKelvey, Quebec Metal Mines Accident Prevention Association, 1 August 1958, AO F1352-3-0-8, OMA Papers, McIntyre Research Foundation.

the researchers conducted a survey of the silicosis hazard in local mines and met with operators to discuss their plans for ventilation and other dust control measures. The recommendations derived from the visit placed a heavy emphasis on promoting aluminum therapy. A recommendation to conduct further studies of local silica dust was partially intended "to promote a closer relationship with the operators in the Blind River area, by showing them that the Foundation is taking a direct interest in their problem as it exists there."¹⁰⁶ There were also recommendations that would ensure aluminum therapy became as much a part of silicosis control as water spraying. The donation of consulting services was recommended to aid in the design and construction of change houses to ensure that the mechanics and logistics of aluminum dusting were incorporated into the design. Because what you do not notice cannot hurt you and because a satisfied customer is a repeat customer, it was suggested that aluminum therapy be given the day production began in the hope that it would be seen as a normal aspect of the change house by the workmen and thus encounter less hostility and suspicion. Finally, it was recommended that the Foundation use its existing customer base to expand its market. Many of the managers at Elliot Lake had worked in the gold fields of Ontario or Quebec, where they were familiar with aluminum therapy. It was hoped that these managers would be supportive of introducing the use of aluminum into the uranium mining industry.¹⁰⁷

The promotional efforts undertaken to gain the attention of Elliot Lake producers appear to have been successful, as the McIntyre Foundation was soon invited by the operators to hold a meeting to inform them of what was known about silicosis and its prevention. The promotional aspect of these information meetings was evident in the decision of the Workmen's Compensation Board not to send any representatives to the Elliot Lake meeting because of its decision to remain neutral in connection with the use of aluminum therapy.¹⁰⁸ This preference to not attend the meeting indicates that the presence

¹⁰⁶ T.E. Newkirk and C.C. Wood, "McIntyre Research Foundation Visit to Blind River Uranium Mines," 28 January-2 February 1957, AO F1352-3-0-8, OMA Papers, McIntyre Research Foundation.

¹⁰⁷ Newkirk and Wood, "Visit to Blind River."

¹⁰⁸ E.E. Sparrow, Chairman, WCB to W.B. Dix, President, McIntyre Research Foundation, 2 September 1958, AO F1352-3-0-8, OMA Papers, McIntyre Research Foundation; W.B. Dix, President, McIntyre Research Foundation to E.E. Sparrow, Chairman, WCB, 9 October 1958, AO F1352-3-0-8, OMA Papers, McIntyre Research Foundation.

of the WCB could have been seen as an official endorsement of aluminum therapy, which is what the Foundation probably intended.

The McIntyre Foundation seems to have been so absorbed in promoting and defending its aluminum powder that it neglected its research mandate, to the chagrin of its industry backers. The failure of the Foundation to delve into the links of tuberculosis and silicosis with the aim of reducing the incidence of tuberculosis was a particular concern. There was also strong evidence that silicosis could develop and progress once a miner left employment in the industry and ceased to receive aluminum therapy. Numerous other projects also awaited the Foundation's budget, including research into more accurate dust survey methods and dust control measures.¹⁰⁹

Organized labour's distrust of aluminum therapy was inevitable, given the close management links of the McIntyre Foundation. In addition to its corporate origins, the board of directors was composed of mine managers and the Foundation worked very closely with the Ontario Mining Association and the Mines Accident Prevention Association. The management affiliation was demonstrated in correspondence between the president of the Foundation and a representative of the Quebec Metal Mines Accident Prevention Association. The letter discusses the concerns of management as being the same as those of the foundation - reducing compensation costs through the prevention or delay of silicosis.¹¹⁰ In 1963, E.R. Olson, the Chairman of the Foundation's Committee on Silicosis, gave a spirited defense of the voluntary and cooperative approach to the prevention of silicosis in Ontario. His defense noted the cooperation of representatives from government, industry, and academia, but made no reference to constant union efforts to improve silicosis prevention programmes. Olsen also detailed the operations and accomplishments of industry groups such as MAPAO in fighting silicosis. The result was a presentation free of criticism of the province's voluntary approach to silicosis regulation.¹¹¹

As an agency of management, the McIntyre Foundation played an important role in promoting industry self-regulation of occupational health and safety. The license issued to

¹⁰⁹ Angus D. Campbell, Manager, McIntyre Research Foundation to W. B. Dix, President, McIntyre Research Foundation, 2 August 1958, AO F1352-3-0-8, OMA Papers, McIntyre Research Foundation.

¹¹⁰ W. B. Dix to R. G. McKelvey, 1 August 1958.

¹¹¹ Olsen, "Cooperative Approach to Silicosis Prevention in Ontario," 3-5.

users of aluminum dust by the Foundation required the licensee to keep dust levels to the minimum feasible limit. To ensure that this obligation was fulfilled, licensees were occasionally requested to submit reports on dust counts and to provide unimpeded access to representatives of the Foundation for the purpose of inspecting dust control measures and airborne dust levels.¹¹² In this manner, the industry was able to enforce its otherwise voluntary guidelines for the prevention of silicosis. The annual conferences were useful for increasing awareness of the latest developments for the treatment and control of the disease. The conferences further served as a platform for the preaching of the Ontario Mining Association's ideology towards occupational health.¹¹³

The use of metallic aluminum powder was discontinued in Ontario in 1979. In the interim between that date and the introduction of aluminum therapy, studies on pneumoconiotics that utilized a control group found that those receiving aluminum therapy and those who thought they were receiving the therapy experienced similar improvements in objective and subjective lung function tests. However, aluminum was deemed effective in delaying the onset of silicosis, even though it was of no benefit once the disease was beyond the early stages. There remained lingering concern among scientists about the harmful effects of aluminum on cognitive performance and about the emerging link between aluminum and Alzheimer's disease. It was on account of these fears that union demands for the discontinuance of aluminum therapy were finally heeded. Given the potential risks of metallic aluminum therapy, it was reserved only for cases of progressive silicosis for which no other treatment was available.¹¹⁴

Statistics Never Lie, They Just Obscure the Truth

In the 1940s, the mining industry of Ontario made a request to the provincial government for the establishment of a body to compile and analyze silicosis data in order to

¹¹² Paterson, *Bulletin* 158, 25.

¹¹³ *Ibid.*, 25.

¹¹⁴ Geraldine M. Brown and Kenneth Donaldson, "Modulation of Quartz Toxicity by Aluminum," in *Silica and Silica-Induced Lung Diseases*, eds. Vincent Castranova, Val Vallyathan, and William E. Wallace (Boca Raton: CRC Press, 1996), 301-2.

track future trends in compensation costs and to monitor the effectiveness of prevention methods. A Medical Statistics Unit was added to the Workmen's Compensation Board in 1950 for this purpose. The statistics collected provide an outline of Ontario's silicosis experience. The number of new silicosis cases reported by the Compensation Board peaked in 1941, reached a secondary peak in 1945-46, and declined from 1948. After about 1950, the number of new cases remained relatively stable at slightly under twenty a year.¹¹⁵

One encouraging sign pointed to the effectiveness of Ontario's silicosis prevention programme. From 1927 to the end of 1962, 93% of the 767 new cases of silicosis with Ontario exposure only had begun mining prior to 1930 and only four had begun work after 1940. It also took considerably longer for silicosis to develop by the 1960s than in the 1930s and the life expectancy of silicotics had become longer, although these last two facts were deemed inconclusive based on the unequal and inadequate sample sizes caused by the ongoing development of new cases.¹¹⁶ This was encouraging in 1962, but it did not mean silicosis was no longer occurring in provincial mines. The reduced dust levels meant that it took longer for silicosis to develop than in earlier times, so miners who commenced work after 1940 were only just beginning to accumulate enough silica dust in their lungs to qualify as silicotic. Silicosis remained the primary source of permanent disability among occupational diseases. The data to 1972 shows that many miners who began work after 1940 did eventually develop silicosis.¹¹⁷

The inconclusive statistics were valuable and encouraging when discussed with their shortcomings. Unfortunately, mining executives and friendly government officials banded about the statistics as evidence of the virtual disappearance of the silicosis hazard from Ontario mines and to demonstrate the success of industry self-regulation. Such misleading claims were always accompanied by a qualifying statement about the need to maintain vigilance and to strive for ever lower dust levels, subtly advising an audience that silicosis continued to develop in Ontario's mines. It might be stated that the incidence of silicosis

¹¹⁵ A.H. Sellars and W.C. Wheeler, "Further Statistics on Silicosis Among Miners in Ontario," in Conference on Silicosis and Other Industrial Pulmonary Diseases, ed. McIntyre Research Foundation (Toronto: McIntyre Research Foundation, 1963), 83-4.

¹¹⁶ *Ibid.*, 86-7.

¹¹⁷ See Table 10, Appendix I; Workmen's Compensation Board, Annual Report, 1951, 16; Workmen's Compensation Board, Annual Report, 1962, 92.

changed little: rather the length of dust exposure required to develop silicosis and the age at which silicosis became noticeable increased, giving the impression that fewer miners were developing the disease.

Officials from the mining industry and the government in Ontario specialized in shifting the blame for silicosis away from themselves. Statistics helped them to do this by comparing the rate of incidence between miners who had worked in dust only in Ontario and those who had also had dust exposure outside the province. About forty percent of silicotics up to 1962 had worked in dust outside of Ontario. The rate of silicosis among miners with exposure in mining outside of Ontario was actually higher than the rate of silicosis among those only having experience in Ontario.¹¹⁸ Such a breakdown of statistics was misleading, because the data could be full of meaning or have no meaning at all. Upon reading the figures, one is left with the impression that close to one half of silicosis cases in Ontario were actually the result of mine work performed in other jurisdictions. This may have been the case, if other jurisdictions did not have as strict a silicosis prevention programme as Ontario mines. However, other factors could also have been at play. Both the overall incidence rate and the Ontario-only incidence rate follow the same downward pattern. As the pattern for those with exposure only in Ontario is not altered by the pattern for those with work experience elsewhere, no basis for the higher rate may have existed beyond coincidence or other mitigating factors.¹¹⁹ For example, those with experience outside of Ontario may have been in the industry longer and thus more prone to develop silicosis. No statistics are given on the length of time silicotics worked in mines outside of Ontario. Five or ten years would be significant; one year or less would not mean much except in instances of heavy silica exposure. The conditions worked in would also have played a role. Dusty mines or mines with a high silica content would have put a miner at risk of developing silicosis, but a clean mine or a mine with little silica quartz would have left the silicosis to develop in Ontario. In other instances, silicosis may have been just as likely to develop had the miner worked only in Ontario or only in the other jurisdiction and the time in the different areas was of

¹¹⁸ Sellars and Wheeler, "Further Statistics on Silicosis Among Miners in Ontario," 84.

¹¹⁹ See Table 5, Table 6, and Table 7, Appendix I. The similar patterns between silicotic miners with experience only in Ontario and all silicotic miners can be seen in Figure 3 and Figure 4 in Sellars and Wheeler, "Further Statistics on Miners in Ontario," 85.

secondary importance. Ontario was assuming, without justification, an attitude of superiority by pointing the finger at out-of-province work to explain away new cases of silicosis, even though it continued to generate many new cases of silicosis every year, without help from any other mining jurisdiction.

While these statistics are noteworthy, they only include compensated cases of silicosis. For this reason, they do not provide a comprehensive outline of the history of this occupational disease. Much of this study deals with efforts to deny sick miners silicosis. Those who had legitimate cases of silicosis but who never received compensation are thus not included. This limitation surely eliminated many cases of silicosis that developed during the 1930s, when the time limit for filing a claim varied between two and five years. Once a miner left the industry he was no longer x-rayed. For this reason, many cases of silicosis went undetected for many years. Doctors not familiar with the disease sometimes misdiagnosed silicosis. Minor cases of silicosis could go unnoticed until late in a person's life or even until an autopsy was conducted. In addition, former miners who were financially secure did not always bother to file a compensation claim.¹²⁰

The statistics also exclude many instances of medical silicosis that were not serious enough to also qualify as disabling silicosis and cases in which silicosis was not discovered until after death, and thus for which no compensation was paid. The less serious nature of silicosis by the 1950s did not necessarily mean that silicosis was no longer caused on a large scale by mining conditions, only that disabling silicosis was rare, perhaps because the disease progressed more slowly and seldom had the chance to manifest itself in disabling form before a more noble death claimed its victims.¹²¹ Discussing similar data from 1972 indicating that the average age at death of silicotics was 5.7 years longer than the average life expectancy of an Ontario male who reached age 35, Dr. Paterson cautioned that the figure could be misleading, as the data needed to be examined in terms of life expectancy from the time of first dust exposure.¹²²

¹²⁰ Paterson, *Bulletin* 158, 5; "Silicosis in Ontario Mines: Extract from the 34th Annual Report of the Mines Accident Prevention Association of Ontario, May 1965," 26-7, AO F1352-2-0-6, OMA Papers, Royal Commission on the Health and Safety of Workers in Mines.

¹²¹ "Extract from the 34th Annual Report of the Mines Accident Prevention Association of Ontario, May 1965." 27.

¹²² Paterson, *Bulletin* 173, 4.

The 1973 Paterson report generally confirmed the statistical trends indicating that silicosis was no longer as serious a menace as it had once been. On the negative side, it reported that there had been no real improvement in the statistics between 1959 and 1972. It further reported the diagnosis of an unfamiliar form of pneumoconiosis developing in the uranium mines of Elliot Lake.¹²³

The numerous controversies and shortcomings that accompanied Ontario's efforts to deal with the silicosis hazard in provincial mines should not obscure the fact that the efforts of labour, management, and government to reduce the incidence of the disease were relatively effective. The decline in the incidence of silicosis in Ontario was attributed to better dust control and ventilation, tuberculosis control, and possibly the use of aluminum prophylaxis. In addition, structural changes in the provincial mining industry aided in the decline of silicosis. As gold and uranium mining reduced their employment levels, nickel and copper mining picked up the slack. This meant that the largest segments of the mining workforce moved out of hardrock mines with a high silicosis risk into mines with a much lessened danger.¹²⁴

¹²³ Ibid., 3, 4.

¹²⁴ Ibid., 1, 6.

Chapter Five: Fighting the Cold War on the Home Front - Silicosis in the Uranium Mines of Ontario, 1955-1975

In 1955, Ontario began to mine uranium commercially. In the rush to meet production and profit targets, health and safety measures were implemented as an afterthought, if they were implemented at all. New, highly mechanized methods of mining generated high levels of dust underground without corresponding improvements in ventilation. High silica and radiation levels were known to exist by mine managers and the Department of Mines, yet nothing was done to rectify the situation. By the 1970s, the impact of the substandard working conditions present in the uranium mines had taken an undeniable toll on the health of the uranium industry's workforce. Pressure from the New Democratic Party and the press forced the Progressive Conservative government of Ontario to call a royal commission to investigate health and safety conditions in the mining industry. The results of the commission eventually led to the passing of Ontario's first comprehensive occupational health and safety law in 1978. The voluntary approach to health and safety regulation was declared a failure.

In the campaign to resist expensive health and safety measures, the management of uranium mining companies cited the devastating impact of such costs on the bottom line and shareholder investments. In addition, the production schedules imposed by the federal government made it impossible to have a proper industrial hygiene programme in place prior to start up. The federal government was so eager to foster the development of uranium mining and to encourage investment that it provided a variety of benefits that virtually guaranteed a high return on investment. These benefits included five year contracts to purchase uranium oxide and a three year tax exemption on uranium earnings. Any production exceeding the contracts could be sold on the open market. These benefits provided investors with a risk premium without the risk.¹ With the federal government as its sugar daddy, uranium mining expanded quickly, employing over 10 000 workers by 1959.²

¹ IUMMSW, "Will Press Government to Improve Conditions," *Mine-Mill Herald* (February 1959): 10.

² IUMMSW, "Safety Poor Second in Canadian Uranium," *Mine-Mill Herald* (May 1959): 10.

The uranium mines were the first in Canada to introduce trackless mining, so called because mining equipment operated on rubber wheels rather than railway tracks. The large equipment was powered by diesel fuel, which filled the mine air with hazardous fumes. The large underground caverns necessary to accommodate trackless equipment were designed so that timbering was not required, increasing the frequency of rockfalls. The increased scale and speed of mining generated much more dust than traditional mining techniques. In many of the mining operations, trackless mining turned workers from specialists whose labour power determined the pace and quality of production into machine operatives. While underground work still required considerable knowledge and skills, trackless mining represented a new phase in the continual efforts to reduce labour costs by reducing the amount of control miners had over the production process. Much of the opposition to the new mining methods centred around the risks they created. This meant that opposition to trackless mining was expressed in grievances about health and safety. Thus, when miners demanded new safety regulations and a greater role for labour in creating a safe and healthy workplace, they were searching for ways of reasserting their skills and their ability to shape the production process.

The collusion between the Ontario Department of Mines and the mining industry was as evident in uranium mining as it was in gold. The government followed its ineffective policy of promoting health and safety through moral suasion and the mining corporations worked to minimize unproductive costs by appearing to cooperate with government officials via unfulfilled pledges of health and safety leadership. Prior to the start of uranium production, a meeting was held to "informally" discuss what measures would ensure adequate health and safety measures in the new mines.³ R.A. Bawden, the Chief Inspector of Mines, was particularly interested in the silicosis and radiation hazards. The representatives of the mining industry were concerned with downplaying these dangers. Before promising any action, Ontario Mining Association director R.A. Bryce wanted assurances from the Department that special provisions were required beyond those normally taken for the

³ Present at the meeting held on 25 May 1955 representing the Department of Mines were Deputy Minister H.C. Rickaby and Chief Inspector of Mines W.E. Bawden, representing the Department of Health was a departmental physicist L. B. Leppard; and representing the Ontario Mining Association were President John Beattie, Executive Director N.F. Parkinson, and directors R.A. Bryce, E.G. Crayston, and R.D. Parker.

control of silicosis. Citing the South African experience, Bawden stated that measures to control silicosis were seen as adequate to also contain the radiation hazard, although further studies were being conducted there. Turning to the subject of acceptable radiation levels, E.G. Crayston asked if the Department of Mines or any authority was able to state what was considered a safe level of exposure. Dr. Leppard, a physicist with the Department of Health replied that different experts had published different figures, but that nothing was yet conclusive. The executive director of the Ontario Mining Association then thought it advisable to mention that the exposure limit suggested in a confidential report on Eldorado Beaverlodge prepared in May 1954 was likely very conservative. Probably not wanting such a low level to be used as a guideline, Parkinson stated that when known, the actual recommended level might be higher. A discussion then ensued on conducting a survey of radiation and dust levels in Ontario's uranium mines. Dr. Leppard suggested that the Department of Health could conduct this survey. Perhaps concerned about the Department of Health's tendency to demand rigorous standards based on scientific evidence, several other options were proposed by industry representatives. Bryce, for no apparent reason, thought such a survey might have more authority if it were done by personnel from the Department of Mines. This preference could be explained by the experience the Department of Mines had in conducting mine dust surveys or by the pro-employer orientation of the Department. R.D. Parker thought it would be best to have the surveys conducted by personnel familiar with both radioactivity and dust surveys. His support was put in the engineering staff of the Mines Accident Prevention Association, which was also an institution run by management interests. Parker was clearly aware of this angle, as he wondered if the government would back the recommendations of the MAPAO if questions were raised publically or in the Legislature about the study. Deputy Minister Rickaby promised that the Department of Mines would have full confidence in the work of the Accident Prevention Association. He stated that his department would fully support the results of the survey if the Association pledged to conduct the study at properties agreed to jointly by the Association and the chief inspector of mines. It is interesting that the minister could pledge his full support for a study that had yet to be conducted. He essentially promised to support whatever the management group's study said about radiation and dust

levels in uranium mines and the policies that would need to be developed in response to the results. It was then agreed that the Mines Accident Prevention Association would undertake a study of environmental conditions in Ontario's uranium mines.⁴

By conducting environment surveys themselves, mine managers were able to take the initiative for health protection away from government regulators and control the agenda. Although this meeting was more concerned with radiation than silicosis, it is instructive because it shows the mining industry representatives taking a very conservative approach to the health issues of uranium mining, with the support of government regulators. The impression one gets from this meeting is that there was a reluctance to proceed with measures for the protection of worker health without conclusive knowledge. The tendency was to err on the side of cost control, not caution. This contrasts with the implementation of aluminum therapy. The very promise of reducing the compensation costs for silicosis sent mining executives scrambling to implement aluminum dusting, with no firm evidence that it was safe or effective.

In seeking to dominate the health and safety agenda, the Ontario Mining Association was not prepared to allow the new members of the mining fraternity to ignore the need for protective measures. The OMA and its members, particularly the gold mines, had worked hard to implement measures to control silicosis. This had been done to minimize compensation costs and to convince provincial regulators that strict legislation was not required to replace the voluntary approach to mine health and safety regulation. Because this system recognized management's sole responsibility for working conditions, it was clearly preferable for the industry to sustain it. To demonstrate its leadership and to ensure that the uranium companies followed accepted standards, representatives of the McIntyre Research Foundation were sent to Elliot Lake to assess the silicosis hazard and advise on the installation of facilities for the dispersal of aluminum dust. The McIntyre Foundation offered the most effective way for the members of the OMA to police its recalcitrant members and enforce their will regarding health protection on uranium producers. The guidelines for dust

⁴ "Memorandum Re: Ventilation and Dust Control in Uranium Mines," prepared by N.F. Parkinson, Executive Director, OMA, May 1925, AO F1352-2-0-2, OMA Papers. Royal Commission on the Health and Safety of Workers in Mines.

control and dust exposure of the OMA and the Mines Accident Prevention Association were voluntary. In contrast, the licensing agreement to use McIntyre's aluminum required the purchaser to fight silicosis primarily through the removal of dust from the working environment. If aluminum therapy could be promoted in Elliot Lake as essential to dust control and good public relations, it would be adopted by the producers, who would then have to meet the standards for dust control desired by the OMA to vindicate its stand in favour of voluntary health and safety regulation.

T.E. Newkirk and C.C. Wood spent about a week in Elliot Lake from 28 January to 2 February 1957 interviewing mine officials and examining the mines on behalf of the McIntyre Research Foundation. They visited the facilities of Pronto Uranium, Algom-Quirke, Algom-Nordic, Consolidated Denison, Lake Nordic Uranium, Panel Consolidated Uranium Mines, and Stanleigh Uranium. Newkirk and Wood reported that most of the operators visited had previously worked in mines where silicosis was a hazard and were aware that measures were necessary to protect the health of uranium miners. This is noteworthy because it contradicts testimony given to the Ham Commission in 1975 that the industry was not aware of the severity of Elliot Lake's silicosis risk.⁵ The report demonstrates that health concerns came second to production concerns. Pronto, Algom-Quirke, and Algom Nordic were the only three mines already in production. Although praise was given to the ventilation systems of the mines, it was mostly praise for the planned ventilation systems; only Pronto had its system in operation. Mining proceeded ahead of the installation of ventilation systems, and even aluminum therapy. Although Pronto had gone the farthest, dust control in the assay office was described as "limited" and aluminum therapy was still not in use after two years of production. Newkirk and Wood were overwhelmed by the scale of trackless mining. They wrote:

The underground operations are so large, the backs so high, with no timber support, that you get a feeling of danger against which you have no protection. The mechanical equipment is so elaborate and so costly that it is hard for a gold miner to make an appraisal of the economics involved.

After a short visit underground you are naturally impressed by the revolutionary methods being developed for hard rock mining. However, you

⁵ See below, p. 165-6.

come away with a feeling of doubt, whether such methods are safe, the most economical or in fact if they will survive without drastic modifications.⁶

It will be seen that the fears of the writers about safety were well-founded.

Newkirk and Wood reported that the ore at Elliot Lake had a silica content varying from 50 percent to 75 percent. Because of this high percentage, they warned that there could be a more serious silica danger at Elliot Lake than at Porcupine or Kirkland Lake. With this in mind, they made a number of recommendations that would limit the silicosis risk and promote the McIntyre Foundation. They proposed tests to measure the solubility of silica dust when treated with aluminum. This would allow for a better understanding of the area's problems and promote closer ties between the Foundation and uranium producers by demonstrating that McIntyre was taking a direct interest in their problems. Not surprisingly, it was recommended that aluminum be used as a prophylaxis against silicosis in all the mines of the area, even on salaried staff exposed to dust. At mines where change houses were still under construction or in the design stage, consulting services were proposed to ensure the buildings would be suitable for the effective dispersal of aluminum dust and to allow for dispersal equipment to be installed prior to the use of the buildings by miners, in order that aluminum therapy could commence as soon as possible for the protection of the men and in the hope that the workforce would be less suspicious of the therapy if it was used from the very start of operations. Rather than providing workers with convincing evidence from neutral scientific sources that aluminum dust was safe and beneficial, the paternalistic minds at McIntyre preferred to be discrete.⁷

Although it generally favoured a laissez-faire regulatory policy, the Department of Mines was not prepared to relinquish its role in promoting a healthy underground working environment. As already discussed, it appointed Dr. John Paterson to evaluate the silicosis situation in Ontario in the late 1950s. After visiting the gold, nickel, and uranium mines of the province, Paterson reported to the Minister of Mines that he was underwhelmed by the measures taken to protect the workforce of Elliot Lake against the high level of silica in the

⁶ T.E. Newkirk and C.C. Wood, "McIntyre Research Foundation Visit to Blind River Uranium Mines." 28 January-2 February 1957, F1352-3-0-8, OMA Papers, McIntyre Research Foundation.

⁷ Ibid.

area's dust. Paterson cited the need for rapid development and high production levels necessitated by the contracts signed with the American government as the main reason why satisfactory health precautions had not been taken. He found that despite the carefully designed ventilation systems and the expensive ventilation equipment, only drifts and cross-cuts benefitted, as little of the fresh air reached the working face. Paterson believed this was because the installation of ventilation pipes required production to stop. High production quotas also meant that a new shift began work only one-half hour after the previous shift had finished blasting, which was not enough time for the dust to settle or be removed from underground. Paterson warned that if the dust hazard was not removed quickly, uranium mining would have a high silicosis rate with a shorter dust exposure rate than had become common at that time.⁸

Another concern of Paterson was the unknown effect on miners' health of the noxious cocktail ingested when silica dust, radioactive dust, aluminum dust, and diesel fumes were mixed together. He refused to rule out the siliceous and carcinogenic properties of the combination and he similarly refused to state that there was an increased risk in uranium mining, but the warning seemed clear - the risk of occupational diseases developing in uranium miners was serious and extra caution was required until more could be learned about the risks of the airborne substances being inhaled. It was unknown which elements of this mixture would prove harmful, and which could have a positive effect. This warning included the aluminum dust being added to the air of change houses, a repudiation of McIntyre's attempts to portray its dust as the magical formula for a robust workforce.⁹ As a result of Paterson's concerns about the effects of radioactive dust, the Ontario government prohibited underground smoking and introduced regulations to reduce radiation exposure in uranium mines.¹⁰

Paterson also found the uranium operators to be violating the chest examination requirement of the Mining Act. In the rush to meet their rapidly expanding labour needs, the companies were unable to wait for new employees to be certified to work underground. This

⁸ Memorandum from Dr. John F. Paterson to J.W. Spooner, Minister of Mines, 28 March 1958, AO RG13-6-2-39, Department of Mines, Silicosis.

⁹ Paterson, Bulletin 158, 24.

¹⁰ Paterson, Bulletin 173, 3.

was considered to be a dangerous and unfair practice. It created the risk of men with tuberculosis being employed underground, with the potential to pass their illness onto their colleagues, leaving them vulnerable to silicosis. It also created a situation in which men already employed were x-rayed and found unsuitable to work in the mining industry. This created hardship in cases where men had moved their families to Elliot Lake, giving up their previous homes and jobs, and incurring considerable moving expenses if they had come a great distance. A hand-written notation at the bottom of Paterson's memorandum indicates that the doctor's concerns were taken seriously by the Mines Department. The chief inspector of mines, Bawden, was going to obtain reports on the dust counts at Elliot Lake and then meet with Minister of Mines J.W. Spooner.¹¹

In response to the hazards of uranium mining, labour tried to bolster its position through the collective bargaining process and political lobbying. The six bargaining points of Mine Mill for 1959 included demands for safety and health provisions in the collective agreement, including the complete elimination of silicosis and radiation hazards. At the same time, demands for greater government involvement were reiterated in a request for stricter inspections, with dust counts made available to miners and the public.¹²

Far from being unconcerned or unaware of the dangers of uranium mining, miners and their union representatives demonstrated a keen awareness of the hazards involved and of the neglect of health issues by management and government. Shortly after the mining of uranium began in Ontario, the provincial Supreme Court transferred jurisdiction over uranium mines from the provincial to the federal government, which regulated the closely related nuclear industry through the Atomic Energy Control Board (AECB). This brought concerns in the labour movement that uranium miners would no longer benefit from provincial legislation regarding working conditions and safety inspections, and that the miners would be denied workers' compensation on the grounds that they were not in a provincially regulated industry.¹³

¹¹ Memorandum from Dr. John F. Paterson to J.W. Spooner.

¹² IUMMSW, "Map Out National Uranium Program for '59," Mine-Mill Herald (February 1959): 10; IUMMSW, "Will Press Government to Improve Conditions," Mine-Mill Herald (February 1959): 10.

¹³ IUMMSW, "Submit Brief to Ontario Government," Mine-Mill Herald (December 1956): 3.

While these fears appear to have been unfounded, it was a continual struggle to enforce the Mining Act with the upstart uranium companies. At the Faraday Mine near Bancroft, employees complained to their union that chest x-ray certificates had not been requested as a condition of employment and that no chest examinations had since been conducted. The Workmen's Compensation Board in turn advised Faraday to have their employees x-rayed.¹⁴ This regulation was probably neglected by Faraday inadvertently in the haste to recruit a workforce and begin development and production. For miners though, the x-rays, while frequently misused, remained the only way in which silicosis could be detected in its early stages, allowing them the freedom to seek other employment or compensation before the disease had advanced to a serious level.

The Mine Mill Western District Convention of 1956 passed a resolution calling on the National Research Council to monitor the potential radiation hazard in uranium mines.¹⁵ This resolution represented the rise of radiation as the other health concern of mine workers, taking its place alongside silicosis. Concern about radiation emerged again in 1958 at the International Symposium on Cardio-Respiratory Diseases in Industry held at McGill University in Montreal attended by Mine Mill research director Lukin Robinson. Robinson reported on a paper presented by Dr. Marvin Kushner of New York on the dangers of radiation in uranium mining. Kushner described how radiation came from the radon gas released from the ore as it was mined. The radon gas broke down into "radon daughters" which attached themselves to dust particles, on which they found their way into miners' lungs. Over time, the radiation could cause lung cancer. In Germany, 50 percent of a study group of uranium miners had developed lung cancer after an average of seventeen years working in radiation. What concerned Lukin was that radiation levels in Elliot Lake were known to be higher than the levels the German workers had been exposed to.¹⁶ A similar report on uranium miners by the Colorado Department of Public Health found that of fifty miners in the uranium industry prior to 1941, sixteen had died of lung cancer in the past three

¹⁴ IUMMSW, "Request from Union..." *Mine-Mill Herald* (December 1956): 3.

¹⁵ IUMMSW, "New Western District BC, Alta., Sask., and NWT," *Mine-Mill Herald* (February 1956): 2.

¹⁶ Lukin Robinson, "Doctor Tells Conference - 50% German Uranium Miners Contracted Lung Cancer." *Mine-Mill Herald* (July 1958): 4.

years.¹⁷ The cancer risk at Elliot Lake emphasized the need for dust control and it provides evidence that the hazards of uranium mining were known early in the history of the industry. Miners with lung cancer would soon join those with silicosis in fighting the Workmen's Compensation Board

On 10 January 1958, Mine Mill held an emergency conference of 60 rank-and-file representatives of all the uranium mines in Elliot Lake to develop a response to the special hazards created by trackless mining and by the high silica content in the area's mine dust. A Resolution on Dust Control and Silicosis Hazards was sent to the Workmen's Compensation Board indicating miners' complaints about dusty working conditions. The basis of the ongoing concern was a report conducted by the Mines Accident Prevention Association in June 1957 of the underground and surface works of Denison Mines. The report noted that dust conditions were generally too high for a variety of reasons, chiefly the hurried production schedule. As a result, water was not used sufficiently to suppress dust and the design of the ventilation system was defective. The report took 141 dust checks in the mine heading and found an average count of 1556 particles per cubic centimetre, while dust samples taken in fresh airways and travelways averaged 1039 particles per cubic centimetre.¹⁸ It was further pointed out that the dusty conditions were of special concern due to the high silica content of the ore and rocks at Elliot Lake. In light of this report, the resolution called on the Minister of Labour and the Compensation Board to enforce effective dust control and regular employee x-rays, along with the usual cry for more generous compensation.¹⁹

This resolution was not the end of the matter. Around the same time, Charles Daly, Ontario's Minister of Labour received a letter from K. Nowak, the president of Blind River and District Local 1001 of the International Union of Mine, Mill, and Smelter Workers' Union. The minister was informed of the dust control report prepared by the Mines Accident Prevention Association of Ontario which reported that silica dust levels in the Denison Mine were seventeen times higher than the recommended safe level. Daly was called on by

¹⁷ IUMMSW, "Alarming Report Issued in US on Cancer among Uranium Workers," *Mine-Mill Herald* (May 1959): 10.

¹⁸ The Ontario Department of Mines considered 300 particles per cubic centimetre to be the maximum safe limit.

¹⁹ IUMMSW, "Seek Effective Dust Control," *Mine-Mill Herald* (January 1958): 5.

Nowak to implement and enforce regulations to protect the health of Elliot Lake uranium miners.²⁰ No changes were made to the Mining Act in this respect, as the concerns of the miners and their representatives were ignored in favour of maintaining the voluntary system of dust control in which management retained the sole right to decide what was a safe working environment.

In the week following the Elliot Lake conference, the concerns of miners about working conditions in the mines were underlined by three accidents which killed two men and injured three. A telegram was sent to J.W. Spooner, the provincial minister of mines, demanding emergency action on the part of the department to deal with the hazards of trackless mining. A meeting was proposed to discuss the situation. In response to the concerns of miners, Spooner sent William Bawden, the Chief Inspector of Mines, to Elliot Lake. The chief inspector and District Inspector Hoffner met with 28 representatives from eight area mines: Algom Quirke, Northspan, Can-Met, Stanrock, Stanleigh, Milliken, Algom Nordic, and Denison. Bawden informed the meeting that his department was aware of the high silica content of area rock and of the high dust counts in the mines. Although the Department of Mines had established a guideline recommending no more than 300 dust particles per cubic centimetre, the lowest count so far achieved by any of the mines was 500 particles per cubic centimetre. In addition, the mines had been asked by the Department to regularly analyze dust samples, but some of the companies had not even purchased the necessary equipment. Of course, because these were only recommendations, inspectors could not punish companies for failing to implement them. The government's voluntary approach to promoting occupational health and safety was only useful with companies where senior managers possessed a conscience. In other cases, financial or legal punishments were required to ensure compliance. Another revelation was indicative of the disregard the uranium companies had for their workforces - although trackless mining had been readily introduced, they were only just beginning to learn how to control the hazards of untimbered tunnels.²¹

²⁰ K. Nowak, President, IUMMSW Local 1001 to Charles Daly, Minister of Labour, 27 January 1958, AO RG7-5-1-9, Department of Labour, Workmen's Compensation Board, General File.

²¹ IUMMSW, "Mine Mill Demands Full Gov't Inquiry to Stop Slaughter in Elliot Lake Mines," Mine-Mill Herald (February 1958): 5.

For their part, the representatives of the miners informed the inspectors that a MAPAO report recommended dust exposure should actually be limited to 101 parts per cubic centimetre, a measure to which the actual dust counts did not even come close. The inspectors were also told that water spraying and ventilation were not properly utilized. In order to counter these problems, the miners requested that dust control reports prepared by the companies be made available to the workers' safety representatives. In terms of safety, the workers also wanted a greater role for themselves in setting standards and investigating accidents. In sum, they presented a case for the equal participation of labour in matters of occupational health and safety, as they were the ones who suffered from the negligence of management. The IUMMSW also called on the government to conduct a full inquiry into uranium mining practices.²²

Between January and April 1958, fourteen men were killed in Ontario's uranium mines. Alarmed at these numbers, Mine Mill appealed to Canadian Prime Minister John Diefenbaker to set up a federal inquiry into safety and health in uranium mining, which was federally regulated. The union was told that such an inquiry fell under provincial jurisdiction. Accordingly, a union delegation led by Executive Board member Ray Stevenson and national President Nels Thibeault met with Ontario Minister of Mines Spooner. The union blamed the unsafe and unhealthy conditions on the hastiness with which the mines were being brought into production. Spooner was impressed enough with the union case to spend four hours meeting the delegation. He agreed with the union's assertion that the speed at which the uranium mines were being rushed into production was unprecedented in the province and he expressed concern over the number of deaths. While management claimed only it had the skills to assume responsibility for health and safety and lamented over the various difficulties involved in resolving the contentious issues, the supposedly ignorant miners proposed a number of remedial actions to Spooner. To control dust, better ventilation was proposed. On safety matters, they recommended timbering to prevent rock falls, the erection of protective barriers, an investigation of the braking system on shuttle cars, and an end to work around shafts during power failures. The familiar call for

²² IUMMSW, "Delegation Asks Minister to Set Up Royal Commission at Elliot Lake," Mine-Mill Herald (May 1958), 4.

a greater labour voice was also issued in the form of a request for miner representation in the Mines Accident Prevention Association, in the demand for the establishment of joint health and safety committees, and in a plea for the right of unions to call witnesses and conduct cross-examinations at coroners' inquests.²³

Workers were not the only ones fretting over the hazardous conditions in the uranium mines. At the request of the Elliot Lake operators in 1957, the McIntyre Research Foundation was to conduct tests to determine what effect, if any, its aluminum powder would have on suppressing the silicosis hazard in the area. By the summer of 1958, no tests had yet been carried out. Angus Campbell, a member of the Foundation's board of directors, wrote to W.B. Dix, president of the Foundation, to express his concern over the delay.²⁴

Stung by union criticisms and under pressure from the rest of the provincial mining industry, the management of the Elliot Lake mines formed the Elliot Lake Mines Safety Group, affiliated with the Mines Accident Prevention Association of Ontario. This can be seen as an effort to show that management was living up to its responsibility for health and safety protection. The group met monthly to review accidents, determine the cause of each accident, and recommend preventive measures.²⁵

The response of the Elliot Lake mines was too late. The IUMMSW had succeeded in convincing Spooner that there were serious health and safety problems at Elliot Lake. After meeting with local operators and after the other representatives of Elliot Lake miners - United Steelworkers of America and Local 1554, Canadian Labour Congress - expressed public concern over working conditions, the Minister of Mines appointed a special committee to investigate mining practices at Elliot Lake and their impact on occupational health and safety.²⁶ The committee was chaired by Professor R.G.K. Morrison of McGill University. Professor A.V. Corlett of Queen's University and Professor H.R. Rice of the University of Toronto were the other appointees. The investigative committee made several

²³ Ibid.

²⁴ Angus D. Campbell, Board of Directors, McIntyre Research Foundation to W.B. Dix, President, McIntyre Research Foundation, 3 July 1958, AO F1352-3-0-8, OMA Papers, McIntyre Research Foundation.

²⁵ Ontario Department of Mines, ed., Report of the Special Committee on Mining Practices at Elliot Lake (Toronto: Ontario Department of Mines Bulletin 155, 1959), 37.

²⁶ After denying Mine Mill affiliation with the Canadian Labour Congress because of its alleged communist links, the CLC set up rival locals in mining communities. These locals were eventually taken over by the United Steelworkers of America, but some maintained their distinctive CLC title alongside their Steelworkers appellation.

trips to the community, where it heard briefs from the labour unions, four local operators, and the ubiquitous Ontario Mining Association.²⁷

The special committee's report outlined a general lack of concern for the workers of Elliot Lake. In Elliot Lake mines, the rate of fatalities per million man-hours worked was 0.965 for the period January to August 1958 and 0.698 from January 1955 to August 1958. In contrast, in the rest of the productive mines of Ontario, the corresponding rates were 0.213 and 0.287.²⁸ From 1955 to August 1958, Elliot Lake accounted for 9 percent of man-hours worked in provincial mining and 14 percent of compensable accidents. The incidence of compensable accidents at Elliot Lake was 45 percent above the weighted provincial average.²⁹ In a ranking of Ontario's sixty-nine mines based on the rate of compensable accidents, a split appears among Elliot Lake employers. Safer than the provincial average were Pronto, which ranked eighteenth, Northspan Panel, which ranked twentieth, and Algom Nordic, which ranked as the twenty-fifth safest mine. Below average were Algom Quirke, placing thirty-fifth. Stanrock, in forty-second place, Stanleigh, which ranked forty-fourth, Northspan Spanish-American, which came in forty-sixth place, Can-Met, ranking fiftieth, and Consolidated Denison, which placed fifty-third. Northspan Lacnor and Milliken Lake placed abysmally in the fifty-eighth and fifty-ninth spots respectively. No other mineral had so many of its mines concentrated in the bottom half of the ranking.³⁰ While these statistics deal with accidents, not occupational disease, it seems reasonable to argue that a company conscientious about safety was also likely to be conscientious about health protection. A firm derelict in one area was likely to be as derelict in the other.

One of the reasons for the poor safety and health record of the uranium mines was thought to lie in the structure of internal safety organizations. It was thought best to have a safety director solely devoted to that job and in a position of considerable influence. In the best instance, the safety director had no other responsibilities and reported directly to the assistant manager. In the worst case, there was no safety director. Even though the superintendent had extensive safety engineering experience, he had numerous other

²⁷ Mining Practices at Elliot Lake, 10.

²⁸ *Ibid.*, 15.

²⁹ *Ibid.*, 20.

³⁰ *Ibid.*, 22-3.

responsibilities to occupy his time. When the safety director had other duties, these often accumulated into a full time job. Health and safety tasks were then delegated to an inspector, who did not exert enough influence to affect change. Many mines had a combined safety and ventilation department. In order for these two responsibilities to be performed adequately, large staffs were required, but not always provided. The practice of giving the engineering department responsibility for both production and ventilation was criticized, as performance usually took precedence over health protection. In order to attract highly qualified and respected people to the position of safety director, it was suggested that a period as safety director become a prerequisite for promotion to the position of mine superintendent. Under the existing system, only production related positions were visited on the road to the top.³¹

Where union representatives were included at regular safety meetings, the effectiveness of the arrangement varied. One mine reported that labour representatives attended all the meetings, while another mine had to cancel three successive meetings because only one or no union representative attended. The fact that the experience varied by mine, not by individual representatives, suggests that attendance difficulties may have lay in the seriousness with which the cooperative endeavour was approached by management or in the way in which employee representatives were treated. If joint meetings came to be seen as ineffective by labour or if aggressive criticism was punished, representatives might not have bothered to show up. In evaluating the benefits of worker representation at safety meetings, the special committee missed the point. Labour representation was praised as an excellent way of promoting safety education. For this reason, it was recommended that labour representatives rotate to expose the greatest number of men to enlightenment.³² The whole argument for joint safety committees was that management needed to be educated about occupational risks and prodded into taking effective remedial measures. While many workers were not angels, it seems incredibly condescending to assume that miners who spent their days surrounded by dust, falling rocks, and hazardous machinery needed to be educated about the dangers of their trade. In order to advance labour's agenda, it would seem better to

³¹ Ibid., 33-4, 38.

³² Ibid., 34-5.

have regular representatives at safety meetings, who were not intimidated by the presence of managers, who were able to effectively and forcefully articulate workers' views, and who were familiar with the other personalities at the meetings and how to get them to cooperate. Continuity of representation seems especially preferable to deal with ongoing or recurring issues.

Several of the Elliot Lake mines conducted regular safety inspections consisting of three staff representatives and three union representatives. Unions were reportedly anxious to include members of the union executive on these inspections. Some mine managers welcomed this idea, while others were adamantly opposed to it. The success of inspection tours was said to depend on effective leadership from the safety director to keep the tour on task and on all parties maintaining an objective approach to health and safety problems. Joint inspections reportedly produced numerous useful comments and recommendations.³³

In its brief to the committee, Mine Mill expressed concern about the level of dust exposure in local mines. It complained about the secrecy with which management and the government guarded information on the actual levels of dust. The union conceded that management had taken some initiatives to reduce dust levels, but felt that the health of mine workers remained in jeopardy. This was because already dangerous levels of silica dust were mixed with the unknown risks of the daughters of radon gas. The products of radon attached themselves to dust particles, on which they were transported to the lungs, where the radon products continued to decay and release additional radiation. The brief quoted from a United States government report on acceptable radiation exposure limits. Mine Mill noted that over the years, scientists had continually lowered the recommended exposure levels. The union also pointed out that the recommendations were based on external exposure and that the impact of radioactive substances in the lungs was still unknown. For these reasons, the union recommended that radiation exposure levels be set low, preferring to err on the side of caution. The Mine Mill brief also took issue with a report on radiation hazards prepared for the McIntyre Research Foundation by Dr. E.B. Gillanders, executive vice-president of the Rio Tinto Mining Company. It cited Dr. Gillanders figures to demonstrate that radiation counts in some areas of Rio Tinto's mines were between six and eighteen times beyond the

³³ *Ibid.*, 34-5.

recommended level. However, the brief objected to Gillander's use of average radiation levels in the mine on the basis that low counts in some areas could obscure dangerous levels elsewhere. To counter the silicosis and radiation hazards at Elliot Lake, the union demanded that dust control problems be approached with the same zeal as production problems had been. It wanted the companies to continue to improve ventilation systems. A greater role was also sought for labour in monitoring the efforts of management. This would only be possible by making ventilation survey reports available to miners, union safety committees, and the union. To back its monitoring efforts, the union wanted more power for the Department of Mines. It was argued that the dust and radiation guidelines set by the Department of Mines should be given the force of law, so that the failure to meet the standards could lead to the prosecution of management. If management claimed to be responsible for working conditions, Mine Mill sought a way of ensuring that managers would take their responsibilities seriously.³⁴

With minor exceptions, the brief presented to the special committee by the United Steelworkers of America and Local 1554, Canadian Labour Congress on behalf of the workers of ten local mines, mirrored the dust control recommendations of Mine Mill. The Steelworkers' brief devoted much less space to concerns about silicosis. It recommended that all mines do their blasting at the end of shifts and that adequate time be allowed for the dust and fumes to dissipate before work resumed. It is shocking that such a basic rule of dust control was not being followed. The union also wanted ventilation systems fully installed before the commencement of productive mining. It was stated that the circulation of air underground could be improved if return air raises were drilled at the ends of the orebody to connect with the vent drifts. To ensure appropriate ventilation was supplied, it was suggested that the Department of Mines undertake a special study of Elliot Lake's ventilation needs.³⁵

To read the briefs presented to the investigative committee by the mining companies is to enter a wonderful world in which there were no industrial hygiene problems in the

³⁴ Ray Stevenson, "Brief No. 1 - International Union of Mine, Mill, and Smelter Workers," in Ontario Department of Mines, ed. Report of the Special Committee on Mining Practices at Elliot Lake (Toronto: Ontario Department of Mines Bulletin 155, 1959), 82-4.

³⁵ James L. Kidd and Ontario Mancini, "Brief No. 2 - United Steelworkers of America (Elliot Lake) and Local 1554, Canadian Labour Congress (Elliot Lake)," in Report of the Special Committee on Mining Practices at Elliot Lake, ed. Ontario Department of Mines (Toronto: Department of Mines Bulletin 155, 1959), 90-1.

mines of Elliot Lake. A.W. McNeil, the general manager of Stanleigh Uranium, described four potential hazards to the health of workers should ventilation be inadequate: silica dust, diesel exhaust fumes, fumes from blasting, radon gas and its daughters. He believed that employees of Stanleigh did not have to worry about these hazards because 121 000 cubic feet per minute of fresh air was circulated, soon to rise to 200 000 cubic feet per minute. It was boasted that the ventilation statistics of the mine were better than for most other metal mines. Stanleigh's ventilation system was not just a lot of fan power, an effort was made to ensure that fresh air reached underground work sites via brattices and circulating fans. Stanleigh also used air and water sprays to reduce the concentration of airborne danger after blasting. Muck piles were watered during mucking, primary blasting only occurred at the end of the shift, and scrubbers were used on diesel equipment. Ventilation surveys and dust counts were taken weekly. Radiation levels were tested at least every three months. It is interesting that Stanleigh reported its radiation levels in the brief, which were well below the recommended level, but not its silica dust counts. One wonders if the latter results were not as satisfactory. All these efforts were coordinated by a full time ventilation engineer, who reported to the chief engineer.³⁶

The managing director of Rio Tinto Management Services, which operated four mines in Elliot Lake, reported that controlling the highly siliceous dust was the most pressing industrial hygiene concern in his mines. Although not necessarily in place, a variety of measures to reduce the silicosis risk were planned or in operation. Rock drills were to have automatic air and water valves. This worthwhile invention removed the responsibility for spraying from the drill operator and shifted the burden for dust prevention back to management, where it belonged. The frontheads on rock drills were also to be vented. Water blasts were used after blasting to speed the dissipation of dust. Materials were to be wetted frequently during scraping and loading. In addition, cloth filters ordered from South Africa were to be installed at ore dumps and passes. Facilities where crushing, screening, and sampling took place were equipped with exhaust systems to filter out dusty air.

³⁶ A.W. McNeil, "Brief No. 3 - Stanleigh Uranium Mining Corporation Limited," in Report of the Special Committee on Mining Practices at Elliot Lake, ed. Ontario Department of Mines (Toronto: Department of Mines Bulletin 155, 1959), 96-7.

Aluminum therapy was in place where suitable facilities existed. Underground operations were also ventilated, although the high levels of radioactivity reported indicated that much improvement was still needed to ventilation systems. Managing director E.B. Gillanders admitted that ventilation had been neglected in the rush to start production and that more work needed to be done, particularly in installing auxiliary ventilation to circulate air to work areas.³⁷

Better education on the use of dust control measures could not compensate for management's failure to provide a healthy work environment. Worker negligence could not be used as an excuse where new technologies and negligent management were at fault. The Mining Act called for 75 cubic feet of air per minute per brake-horsepower to ventilate diesel engines used underground. Because of the dense concentration of diesel equipment used in trackless mining, this standard was frequently violated. In the same way as smog was the price of modern urban life, underground dust was characterized as the inevitable result of mining. In both instances, the need was to establish medically sound maximum exposure levels. In highly siliceous mines such as those at Elliot Lake, a dust count of 300 particles per cubic centimetre or less was considered good. Acceptable radiation levels were measured in terms incomprehensible to the layman, and the mining companies of Elliot Lake claimed to have their radiation levels below the suggested maximum.³⁸ The members of the special committee expressed confidence that the planned ventilation systems would serve to keep dust levels at a satisfactory level, as long as auxiliary ventilation ensured that air circulation reached working areas. As an extra precaution, it was recommended the operations adopt a two-shift-per-day schedule, to allow the dust from blasting to clear before work recommenced.³⁹ The only problem was that the mines had been operating for almost five years without suitable ventilation. Because of the delay, silica dust and radon daughters had been given plenty of time to accumulate in miners' lungs. For this reason, the maximum recommended exposure limits for these substances, designed to minimize health damage

³⁷ E.B. Gillanders, "Brief No. 4 - Rio Tinto Management Services Limited," in Report of the Special Committee on Mining Practices at Elliot Lake, ed. Ontario Department of Mines (Toronto: Department of Mines Bulletin 155, 1959), 118-19.

³⁸ For the curious, the maximum radon daughter exposure was a working level of 1.3×10^5 million electron volts of potential alpha energy per litre.

³⁹ Mining Practices at Elliot Lake, vii, 51-2.

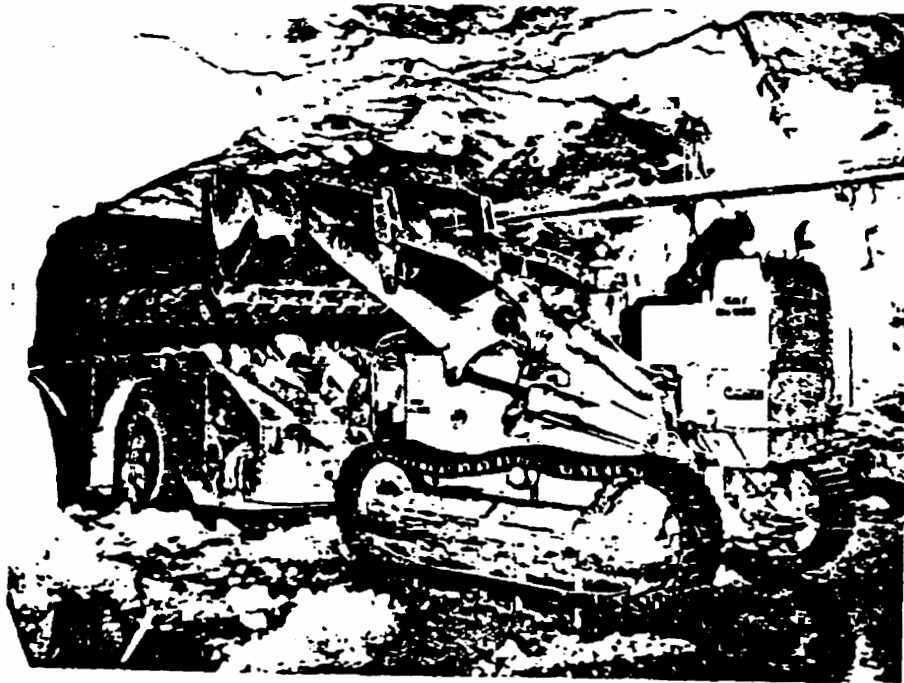
over a long period of exposure, may have been rendered inadequate before they had a chance to work.

In order to ensure that mine operators were meeting their dust control goals, the unions recommended that dust survey reports be made available to them. The unions felt greater openness about dust levels would enable them to act more effectively in the fight against lung disease. The investigating committee saw no need for this, as the reports were already sent to the Department of Mines, which used the results to assemble general trends in dust and radiation levels for publication in its annual report. In addition, the operators claimed they were interested in keeping the public informed about dust and radiation levels in the mines.⁴⁰ With this spirit of cooperation and openness, there was no need to force the operators to keep workers informed about the state of the working environment. Naturally, when companies failed to meet the dust and radiation targets, which it will be seen was quite frequently, the survey results never saw the light of day.

The report paid no attention to the impact of trackless mining methods on dust levels. It has been seen that silicosis emerged as a problem in the 1920s on account of new drilling methods and a faster pace of production. Trackless mining continued this trend. Underground work became mechanized on a massive scale. Muscle power and small ore moving machines were replaced by mechanical muckers, conveyers, and front-end loaders that moved tons of ore and waste at once (Figure 3). They generated more dust than a shoveller ever did. New designs made it possible for a drill carriage to hold several drills (Figures 4). This meant a number of drills working at the same face instead of just one. This would have increased dust levels in the immediate working area.

The International Union of Mine, Mill, and Smelter Workers accused management of avoiding its health and safety responsibilities. Management statements on the health and safety problems at Elliot Lake referred to the carelessness or inexperience of workers as the main factor. The union argued that because uranium mining was a new industry with large numbers of inexperienced men, management had a responsibility to properly train its employees. Tight production schedules were no excuse for a poorly prepared workforce. A military analogy was drawn to point out that no worthy general would send his soldiers into

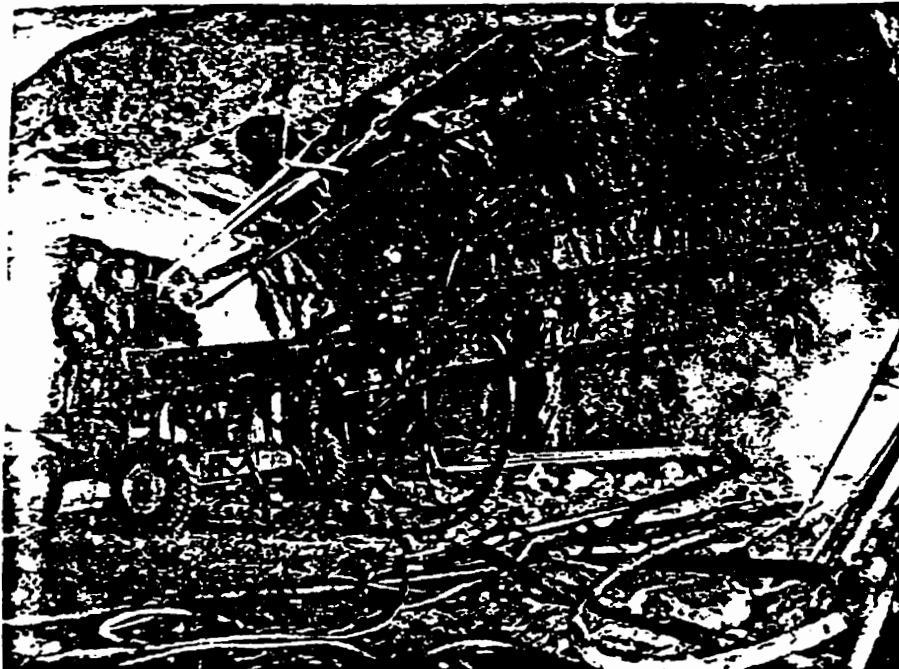
⁴⁰ *Ibid.*, 52.



A diesel-powered, front-end loader dumping ore into a diesel-powered shuttle-car, Algom Nordic mine.

Figure 3 -

Source: Ontario. Department of Mines. Report of the Special Committee on Mining Practices at Elliot Lake, 49.



With this hydraulically-controlled, mobile, drill carriage two men operate three compressed-air rock drills. Algom Nordic mine.

Figure 4 -

Source: Ontario. Department of Mines. Report of the Special Committee on Mining Practices at Elliot Lake, 57.

battle without having put them through basic training. Surprisingly, the practice of placing new employees with experienced miners to teach them the trade was criticized. This practice recognized the skills and value of experienced miners and harkened back to the days when older miners passed their knowledge onto novices, who assisted as unofficial apprentices. However, in an era of engineering directives, increased supervision, and production quotas, this ancient practice was a burden on older workers. Training new employees placed extra responsibility for safety on the experienced miner and often increased his workload, as he not only had his work to worry about, but also the work of the trainee. By placing training responsibilities on experienced workers, managers were evading their responsibility to provide training.⁴¹ Management could not demand complete authority over the field of health and safety and at the same time place all the responsibility and blame for problems on the workforce.

As the balance of power shifted, so did attitudes about training the next generation of miners. Mechanization and increased supervision had deprived miners of many of their skills. Instead of management depending on the knowledge of the workforce to remove ore from the ground, miners depended on managers and engineers to teach them the skills they needed to fulfill their role in the production process. In an effort to have mining recognized as a skilled occupation, to ensure proper mining practices, and to take the responsibility for training miners away from management and the burden away from the existing workforce, the IUMMSW proposed that mining become a certified trade. This familiar union proposal, previously rejected by management and government, wanted a joint labour-management-government board to certify miners. Such a system would ensure that even when management put production schedules ahead of training, the workforce would still possess the knowledge to work safely. If management was going to blame unsafe and unhealthy mining practices on workers, the union wanted the workers to have the training to know when they were not following proper practices, as management frequently failed to provide this.⁴²

⁴¹ "Brief No. 1," 85.

⁴² *Ibid.*, 85-6.

While the IUMMSW brief pushed for management to assume its responsibility for working conditions and training, the certification programme would ensure that miners were able to competently assume a greater role in occupational health and safety programmes. These could only be effective if workers understood the value of such programmes and could contribute their knowledge through participation in their development and enforcement via negotiated and legislated joint committees.⁴³

Of the two unions representing Elliot Lake miners, the Steelworkers were supposedly less radical. However, the Steelworkers took a stronger stand against management rights. The union agreed with Mine Mill that improved training was needed of both supervisors and miners, although it said nothing about certification. Instead of demanding that management assume its responsibility for health and safety, the Steelworkers asserted that unions should be equal partners, and that labour's role was best manifested through joint safety committees. It reported that local managers were eager to cooperate with workers on these committees, but were hindered by corporate policy.⁴⁴ These policies may have rendered joint committees largely redundant on account of a strident defence of management rights, which saw any union activity on company property as akin to unlocking the gates to welcome the communist revolution. As late as 1964, the joint committee at Rio Algom's Milliken Mine only included supervisory personnel. Rio Algom's Nordic Mine did not even have a joint committee. Denison's safety committee did not provide for union representation, only referring to management and employees. Only Stanrock had a joint management-union committee.⁴⁵

Rio Tinto was quite clear about the roles of management and labour in regards to health and safety. Management was to set all policies and make all decisions and labour was to follow management directives. Suggestions from the ranks were welcome, but could not be enforced. The brief stated that:

Management has the responsibility of conducting operations in a safe, healthful and lawful manner; it has and must continue to have, full authority to do so. Management is aware of its obligations to employees, to the

⁴³ Ibid., 86.

⁴⁴ "Brief No. 2," 93.

⁴⁵ "Tabulation of Contents of Labour Agreements as at March 31, 1964," AO F1352-1-0-1, OMA Papers, Collective Agreements.

community and to the shareholders, of making these mines profitable in the true and full meaning of the word, whereby a fair return is paid for capital and fair wages with steady, safe work is provided for all employees.

To adequately fulfill these responsibilities, management expects every employee to assume his proper share of responsibility to: 1) observe and learn all safe practices and rules regarding his work and environment; 2) protect himself and fellow workmen from injury; 3) Take proper care of equipment and maintain it in a safe operating condition at all times; 4) Perform a fair day's work.⁴⁶

The Ontario Mining Association provided its two cents to the debate about who had what responsibilities. The Association touched upon union demands for joint safety committees and critiqued the proposal because joint responsibility was seen to infringe on the legislated right and duty of management to implement and enforce rules on company property. The Association went on to argue that management's responsibility could not be effectively delegated or shared with unions or any other organization. This was because studies showed that up to 96 percent of accidents were due to human error and only 4 percent were caused by mechanical failure. Union members involved in inspections and committees, committed to defending their brothers, would only focus on the minuscule number of problems caused by mechanical failures, ignoring the human factor. This would render such joint efforts meaningless.⁴⁷ The OMA was not prepared to have union representatives defend workers from unjust accusations of wrong-doing, when factors such as poor engineering, inadequate training, or high production quotas were ultimately responsible. It seems management really only wanted the responsibility to blame employees for unsafe work practices, not to find the root causes of health and safety problems.

The special committee attempted to mediate the power struggle between management and labour. In so doing, it supported most of the assertions of management. Many of the problems experienced in Elliot Lake were excused as the inevitable result of commencing production, as it took time for supervisors and workers to gain experience and to function effectively as a team, and for the operation to become efficient in all respects. It

⁴⁶ Gillanders, "Brief No. 4," 102.

⁴⁷ J. Beattie, "Brief No. 6 - Ontario Mining Association," in Report of the Special Committee on Mining Practices at Elliot Lake, ed. Ontario Department of Mines (Toronto: Department of Mines Bulletin 155, 1959), 124-5. It should be noted that many of the incidents resulting from human failure were caused by poor management practices, including heavy production demands and poor training.

found that the rapid expansion of production to meet contracts came at the expense of profits, and that it was unfair to say the welfare of the workforce was sacrificed for production, when 65% of accidents were due to unsafe acts.⁴⁸ This defense not only ignored the fact that high production demands may have been at the root of the unsafe acts, but it also overlooked the inadequate ventilation and dust control measures implemented. The responsibility for ventilation clearly lay with management, and production demands necessitated the start of mining before ventilation could be installed.

Calls for a greater government role in health and safety were rejected on the grounds that Department of Mines staff could not be expected to relieve supervisors of their responsibility in this field. As with all laws, it was not possible to detect every infraction of the Mining Act. As management and labour were both interested in promoting a safe and healthy workplace, cooperation was urged. The degree to which cooperation should take place was a matter of opinion to which a resolution could best be achieved through negotiation. The roles of management and labour could be negotiated, but not legislated. The committee advised that no matter what form cooperation took, management was morally, legally, and financially responsible for health and safety. It therefore had to maintain the authority to fulfill its responsibility. For their part, unions had a responsibility to their members to ensure that the workplace met reasonable health and safety standards. Unions could also assume a moral responsibility for educating their members about safe work practices and for disciplining them for disobedience.⁴⁹ This latter point recommended that union leaders adopt a paternalistic attitude towards their members. This again carried the assumption that miners were ignorant about the dangers they faced and needed guidance. In reality, union leaders were often pushed by rank-and-file members into taking a stronger stand on issues of health and safety. The special committee did not advocate the certification of miners, merely recommending improved training of the uranium workforce.⁵⁰

Since 1926, the mining industry had viewed the removal of high risk workers from their jobs as the most effective means of controlling silicosis, or at least the compensation

⁴⁸ Mining Practices at Elliot Lake, 56.

⁴⁹ *Ibid.*, 57, 58.

⁵⁰ *Ibid.*, 58.

costs associated with silicosis. These purges continued unabated in the mining fields of Elliot Lake. In January 1958, Local 1001 of Mine Mill, filed a protest with the Minister of Labour on behalf of members fired by Consolidated Denison Mines. A large number of members, most with considerable seniority, were reportedly discharged or given discharge notices because they were no longer deemed fit for employment in a dusty environment, even when they did not work in a job involving a dust hazard. Local 1001 president K. Nowak, perhaps sensing that Denison was trying to remove early cases of silicosis before they qualified for workers' compensation, wished to know if there were any government regulations denying a worker the right to work in a non-dust exposure occupation if his x-ray showed him unfit for dust exposure.⁵¹ Nowak appears to have been fighting not only to protect the jobs of his members, but to force Denison to assume some responsibility for the men the company employed and who lost their health in the service of the firm.

In 1962, some Elliot Lake miners began to show signs of silicosis. By 1966, this disease was diagnosed as a previously unknown form of pneumoconiosis. It was neither classical silicosis nor lung cancer, instead appearing to be a mixture of granulomatous and silicotic lesions. The new form of silicosis was characterized by the early onset of the disease after a short period of exposure in the mines of Elliot Lake. By 1974, 93 cases of this form of silicosis were suspected, all of whom had commenced working at Elliot Lake prior to 1960, but this was not necessarily a sign that the disease was no longer occurring. When the Ontario Mining Association became aware of the unusual pneumoconiosis, it requested the Minister of Mines and Northern Affairs to call a meeting to discuss the problem. A meeting was convened and the problem was discussed by the Minister of Mines and Northern Affairs, the Minister of Labour, the Minister of Health, Dr. John Paterson, senior departmental staffs, and consultants. As a result of the meeting, in November 1970, the Minister of Mines appointed a committee to study Elliot Lake pneumoconiosis. The government included a representative of the mining industry on the committee, but neglected to invite a representative of the sick workers most affected by this disease.⁵²

⁵¹ K. Nowak, President, IUMMSW Local 1001 to Charles Daly, Minister of Labour, AO RG7-5-1-19, Department of Labour, Workmen's Compensation Board, General File.

⁵² Paterson, Bulletin 173, 26; MAPAO, "44th Annual Report, May 1975," 18, AO F1352-2-0-4, OMA Papers, Royal commission on the Health and Safety of Workers in Mines. The committee was chaired by Dr. E.

In order to better understand the new form of pneumoconiosis, the committee recommended a research programme to study the incidence, clinical development, and causes of the disease. This programme included the preparation of employee lists to check compensation claims against; detailed studies of environmental conditions in Elliot Lake mines, based on new surveys and the records of previous surveys regularly conducted by the companies and the MAPAO; the examination of Elliot Lake miners' chest x-rays, sputum samples, and lung tissues when available; and laboratory studies on animals to recreate and better understand the pulmonary changes observed in the miners. It was recommended that Dr. R.B. Sutherland of the Ministry of Health serve as project director. These studies, expected to cost \$213 400, were never started.⁵³

While classical silicosis had been complicated by tuberculosis, silicosis contracted in uranium mines appears to have been complicated by lung cancer. Unfortunately, the small sample size available made it difficult at first to distinguish between lung cancer acquired in the normal course of living and that acquired in uranium mining.⁵⁴

The emergence of a health crisis at Elliot Lake came at an opportune time in the history of Canadian labour. It was in the 1960s that general concern over the working environment was increasing and attracting the attention of more workers, union officials, and left-wing politicians. In the unhealthiest workplaces, such as those with high rates of silicosis, workers were often more radical than union officials on issues of health and safety. In other workplaces, where the incidence of industrial disease and accidents was low, or where chemical dangers were not as visible as dust hazards, union officials often experienced considerable difficulty inspiring enough concern about health and safety issues to take effective action.⁵⁵

Mastromatteo of the Department of Health. Its other members were Dr. R.B. Sutherland, Department of Health; Professor H.N. MacFarland, York University; J. McNair, Department of Labour; Dr. C.H. Stewart, Workmen's Compensation Board; R. Yourt, Department of Mines; E.A. Perry, Ontario Mining Association, Mines Accident Prevention Association of Ontario; Dr. J.E. Cowie, consultant.

⁵³ Paterson, *Bulletin* 173, 14, 26-9.

⁵⁴ W.B. Dix, President, McIntyre Research Foundation to Norman H. Wadge, Executive Director, OMA, 7 February 1973, AO F1352-3-0-12.1, OMA Papers, McIntyre Research Foundation.

⁵⁵ Clinton Jencks, Kevin Conley, Elie Martel, and Cathy Walker, "'Building Tombstones in Our Lungs': Comments on Health and Safety," in *Hard Lessons - The Mine Mill Union in the Canadian Labour Movement*, eds. Mercedes Steedman, Peter Suschnigg, and Dieter K. Buse (Toronto: Dundurn Press, 1995), 222-4.

The lack of action on the part of management was curious given that company doctors reported signs of pulmonary disease among uranium miners in the late 1950s. No attempt was made to inform workers about the obvious health risks, either in the 1950s or after 1964, when silicosis and lung cancer had been diagnosed in several workers. In addition, the working environment worsened in the latter half of the 1960s. In the 1970s, NDP researchers learned from old mine inspection reports that in the period between 1965 and 1973, dust levels in the mines remained at least eleven percent above the standard recommended by the Mines Accident Prevention Association. In addition, it was found that between 1966 and 1970, the average level of dust in Elliot Lake mines actually increased. Officials with the Department of Mines and the Department of Health and with the federal regulator of uranium mines, the Atomic Energy Control Board, were also very secretive about the underground conditions at Elliot Lake. No effort was made to legislate an improvement in working conditions.⁵⁶

Dr. Charles Stewart, head of the Chest Disease Branch of the Workmen's Compensation Board, was aware by 1970 that many uranium miners were showing early signs of silicosis. He approached the two remaining uranium operators, Rio Algom and Denison, about moving these workers to surface jobs where they would be less exposed to silica dust. The companies were not interested in participating in Stewart's plan unless they could have the names of the affected miners. Since this information was not provided, no miners were moved. It was at this point, in 1972, that Stewart finally informed the Steelworkers about the health situation at Elliot Lake and went public with his knowledge about the development of the new cases of silicosis.⁵⁷

It was around the time that Stewart went public with his concerns that the Ontario New Democratic Party began to speak on behalf of the miners. The most passionate and articulate advocate of the miners' cause was the party leader Stephen Lewis. Another of the

⁵⁶ Brian Walker, "The Politics of Occupational Health and Safety: Ontario's Mine Workers and Government Regulation of Environmental Hazards at the Workplace, 1965-1978" (Ph.D. diss., University of Toronto, 1988), 128-33. In December 1967, the Department of Mines introduced a new level of radiation exposure to reduce the incidence of lung cancer, but this did nothing to address the problem of silicosis. In general, much more attention was paid to the cancer risk of uranium mining than to the silicosis risk, which likely had something to do with the cross-class fear of the former disease.

⁵⁷ Walker, "The Politics of Occupational Health," 135.

leaders in the fight for better protection of workers' health was Sudbury NDP M.P.P. Elie Martel, who took special pleasure in attacking the record of Inco, Sudbury's largest employer. Through his efforts, Martel became aware of the collusion that took place between the Department of Mines, the Workmen's Compensation Board, and the mining industry, including advance notice of inspections and joint efforts to dismiss employee complaints and compensation claims. These activities and the overall lack of progress on health and safety issues led the labour movement to conclude that the only way to win change was to gain power over the issues.⁵⁸

Political and union pressure forced Leo Bernier, the Minister of Mines, to announce a study of miners' health and working conditions in Elliot Lake. This survey was not as extensive as the union had desired, so the steelworkers turned to the federal government to conduct a more comprehensive survey. Impatient with the bureaucratic bickering, workers at Denison Mines went on a wildcat strike over conditions in the mine in April 1974. The strike brought the conditions at Elliot Lake to the attention of the press and public. It was from this time on that the NDP began to forcefully criticize the government, with Lewis even accusing the mines engineering branch of criminal negligence. Eventually, opposition pressure and the numerous revelations about unhealthy working conditions forced the Conservative Minister of Mines, Leo Bernier, to appoint a one man Royal Commission into the Health and Safety of Miners. The commission came to be known as the Ham Commission, after its chairman, University of Toronto engineering professor James Ham.⁵⁹

The Ham Commission is worthy of its own study. It suffices to say here that the positions taken by management and labour were consistent with those described in this study. Only the Department of Mines changed its historic stance by advocating a drastic strengthening of mine regulation and a significant increase in the power of workers over health and safety. Labour was pleased and the operators were outraged. In testimony given to the Ham Commission, mining executives and government officials lamented that they were unaware of the dangers posed to workers by uranium mining. This was either a blatant

⁵⁸ Elie Martel, "'The Name of the Game is Power': Labour's Struggle for Health and Safety Legislation," in Hard Lessons - The Mine Mill Union in the Canadian Labour Movement, eds. Mercedes Steedman, Peter Suschnigg, and Dieter K. Buse (Toronto: Dundurn Press, 1995), 195-202, 208-9.

⁵⁹ Walker, "The Politics of Occupational Health," 13-42.

lie or a serious lapse in memory. There was an overwhelming body of evidence demonstrating the failure of industry self-regulation.⁶⁰

Unlike previous government investigations into working conditions in the mining industry, the report of the Ham Commission did not just repeat the message of mine operators and managers. Its recommendations were extended to apply to all industrial workers in Bill 70, The Occupational Health and Safety Act, which was passed into law in 1978. According to Elie Martel, two significant changes resulting from this legislation were the consolidation of responsibility for health and safety into a single agency, so that responsibilities and tasks were clear and that agency, unable to pass the blame along, was forced to be more accountable for the state of working conditions in Ontario. It also led to the establishment of the internal responsibilities system, which in theory required workers and managers to cooperate in identifying and dealing with health and safety issues. Joint health and safety committees were made mandatory and union representatives were granted the right to accompany government inspectors on inspection tours. Significantly, workers were given the right to refuse to perform unsafe work without fear of punishment.⁶¹ Miners, and workers in general, were not successful at increasing their power over workplace health and safety until the voluntary approach was found to be ineffective and morally bankrupt. Despite all the protests conducted by miners, their union, and the NDP, workers were only victorious because they were able to gain the support of the state, not because labour had become equal in power to capital. The health crisis in uranium mining may have inspired occupational health and safety legislation that guaranteed labour a voice in the workplace, but even this could not stop the daily carnage experienced on the job by all workers.

⁶⁰ AO F1352-2-0-7 to F1352-2-0-13, OMA Papers, Royal Commission on the Health and Safety of Workers in Mines.

⁶¹ Martel, "The Name of the Game is Power", 203; Walker, "The Politics of Occupational Health," 199-201.

Conclusion

Since intrinsic value is an unpopular concept, history is required to teach us something. If there is any lesson to be learned from the history of silicosis in the Ontario hardrock mining industry, it is that voluntary regulation cannot be successful in a free market economy. This is because it leaves management to balance the competing demands of profit maximization and costly health and safety measures which do not contribute directly to production. It was primarily because of the costs of workers' compensation that mining companies took an interest in preventing silicosis. As the example of Elliot Lake shows, where production pressures were unusually high, even compensation costs did not inspire an enlightened approach to protective health measures. This is not necessarily a condemnation of the free market, only a warning that the human face of capitalism will not appear on stage without considerable cajoling from a strong labour movement sharing responsibility for occupational health and safety matters and from stringent, yet reasonable, government regulations made in consultation with all stakeholders. This is a valuable lesson for a *laissez-faire* era obsessed with weakening unions and deregulating industry.

The history of silicosis also serves as a warning to workers, managers, and compensation boards to take a broad approach to industrial health hazards. The focus of the mining community on silicosis was often at the expense of other diseases, which went unnoticed, uncompensated, and uncontrolled. Sick miners insisted they had silicosis when often they suffered from asthma, emphysema, cancer, or some other lung condition. Protesting against a silica hazard where none existed allowed companies and the government to ignore other chemicals in the working environment. Everyone's focus on silicosis delayed the compensation of other diseases related to silicosis, particularly those that also occurred in non-occupational settings, such as tuberculosis and cancer. Workers and medical researchers must be vigilant to ensure that the fine line between occupational and non-occupational disease in industrial society is not used to deprive sick members of the working-class of the compensation they are entitled to.

The evolution of silicosis in Ontario mines reflects the ambiguous role of technology in the twentieth century. Silicosis was a disease of technological change. New methods of

mining caused an epidemic of pneumoconiosis early in the century. Later, new technologies were introduced to drastically reduce the incidence of the disease. However, the preventive capacity of technology was constantly strained by new technologies of production that worked faster and on a larger scale, and that generated larger quantities of respirable dust. Technological change was also at the centre of the conflict over workplace control which silicosis became part of. Technology reduced the autonomous skills of miners and gave management a greater role in determining the pace and methods of production. In response, miners tried to reestablish some of their traditional power over the workplace through avenues not directly related to production, fighting for items such as union recognition and joint health and safety committees. These demands offered an indirect way of regaining some control over the production process through their ability to transform working conditions. If miners could no longer determine how the work would be done and how fast, they sought to at least participate in the design of job descriptions, pinpoint and resolve hazardous situations, and oppose unsafe or burdensome work practices. The negative reaction of mine workers to increased management control may also have been responsible for the hostility shown to many of the health protection measures introduced by management.

Although this study treats silicosis as a health and safety issue linked to conflicts over worker's compensation and workplace control, the compensation of silicotics shows parallels with the history of social assistance. The most predominant parallel was the notion of "less eligibility." This concept was articulated in the British Poor Laws Report of 1834 and soon spread to England's North American colonies. Less eligibility assumed that any form of economic assistance to the indigent was likely to promote laziness. To prevent the poor from completely losing their already meagre work ethic, any form of relief had to leave the recipients worse off than they would be working for the lowest wage being paid.¹ This principle seems to have been amalgamated into workers' compensation laws. A sick or injured worker received a disability pension that was far less than he (or she) had earned when working. Even though the worker may have been disabled by circumstances beyond his control, compensation did not fully cover his lost earning power. This was no doubt to

¹ James Struthers, *No Fault of Their Own: Unemployment and the Canadian Welfare State, 1914-1941* (Toronto: University of Toronto Press, 1983), 6-7.

prevent abuse of the compensation system. If someone saw that he could receive the same salary sitting at home as working all day, nothing could stop him from injuring himself or his health, or from exaggerating or faking a disability in an attempt to fool physicians and compensation officials. The payment of a full salary would also have discouraged rehabilitation efforts.²

The concept of less eligibility made distinctions between the undeserving and the deserving poor. The undeserving poor were those considered capable of working. The deserving were those incapable of performing work to support themselves, including the sick and disabled.³ On the one hand, workers' compensation is a recognition of the need for society to care for those deserving individuals disabled on the job and rendered incapable of further labour. On the other hand, the punitive nature of workers' compensation suggests that disabled workers were regarded with suspicion. Compensation levels made it clear to sick workers that they were not deserving of the same income received by someone who was employed, for the simple reason that they were not working. This reinforced to disabled workers the idea that they were given their sustenance out of mercy, not out of entitlement. People filled with gratitude were less likely to protest against injustices than people with rights. Low compensation rates also conveyed lingering suspicions about the status of disabled workers as victims. Given the large role attributed to human error in industrial accidents, were workers really innocent victims of industrialization or did many bring misfortune upon themselves through careless behaviour at work, in the same way that many poor met their ruin through drink or prostitution? The unduly harsh treatment of silicotics who contracted tuberculosis reflected this culture of blame, as the real problem was considered to be tuberculosis needlessly contracted outside of the workplace, not the conditions endured while at work.⁴ Silicotics apparently should have done more to avoid contracting tuberculosis, as they knew they were vulnerable. The perceived need to keep disability pensions lower than working wages could also have reflected the continuing influence of employers' liability law, in which workers were assumed to have entered into an

² This problem is not mentioned in any of the sources examined, but I contend that such assumptions were so ingrained in the consciousness of policy makers that they did not need to be raised.

³ Struthers, *No Fault of Their Own*, 6-7.

⁴ For an example of this outlook, see above p. 46.

employment contract fully cognizant of the dangers involved and willing to assume those risks.⁵

Just as poverty was carefully defined to narrow its application only to the “deserving”, so were silicosis and disability carefully defined to limit who was eligible for workers’ compensation. It has been shown that restrictions often took the form of exposure and residency requirements, limits on the time available for filing a claim, and the evaluation of disability on the basis of earning power rather than medical condition. The definition of compensable silicosis also changed from time to time and careful distinctions were made between occupational and other types of disease.

Like many other diseases, silicosis was as much a concept as a condition. While a disease is defined as much as possible by observed characteristics, a concept is defined only after negotiation by competing interests and ideologies. Silicosis was first identified as a disease in Ontario in 1921. However, providing insurance against the illness under the auspices of a bureaucratic institution such as the Workmen’s Compensation Board required that silicosis be defined. The process of defining silicosis transformed it from a disease into a concept. Different classes and occupations defined silicosis differently, depending upon what their interests were.⁶ Miners seeking compensation wanted the definition to be as broad as possible, operators and government officials hoping to minimize compensation costs wanted the definition to be governed by time limits and a decreased ability to earn income, industrial hygienists and scientists wanted the definition to reflect their own scientific classifications. Silicosis was initially given a very narrow meaning, but as the strength of labour and medical knowledge increased over the study period, the definition was gradually broadened.

The control of silicosis was similarly politicized by class conflict. Management asserted its right to implement whatever preventive measures it deemed worthwhile,

⁵ See Eric Tucker, Administering Danger in the Workplace - The Law and Politics of Occupational Health and Safety Regulation in Ontario, 1850-1914 (Toronto: University of Toronto Press, 1990), 41-5.

⁶ For a discussion of the same phenomenon in the United States, see Gerald Markowitz and David Rosner, “The Illusion of Medical Certainty: Silicosis and the Politics of Industrial Disability, 1930-1960,” in Framing Disease - Studies in Cultural History, ed. Charles E. Rosenberg and Janet Golden (New Brunswick, New Jersey: Rutgers University Press, 1992), 186-205.

unhindered by worker or government interference. This was satisfactory to the various Liberal and Conservative administrations which governed Ontario, as they were supportive of a laissez-faire business environment. Mine employees, in contrast, felt they should have a say in matters of importance to their health. As the conflict between management and labour for control of the workplace intensified over time, silicosis prevention became linked to the larger stage of industrial relations. The government used gentle persuasion to encourage compromise by appointing a variety of committees to investigate conditions in the mines and make recommendations to improve conditions. Each side acted on recommendations which suited them and ignored the rest. The result was a failure to deal effectively with the presence of silica dust in the hardrock mines of Ontario until over fifty years had passed since silicosis first became a recognizable presence in the environment of the mines. The failure of the voluntary approach to health and safety permitted the dust demon to dance across the stage of class relations long after the curtain should have been lowered on its consequences, with its victims compensated for their lost lives and extended suffering.

Appendix I - Ontario Silicosis Statistics

Table 5 - Statistics on Compensable Cases of Silicosis in Ontario, 1926-1958

Year	New Cases of Silicosis	Average Age at Diagnosis (Years)	Average Dust Exposure in Ont. (Years)	Average Dust Exposure Outside Ont. (Years)	Died by 1958* (#)
1926	127	39.7	12.6	1.4	69
1927	31	43.1	12.3	1.9	34
1928	25	41.7	13.3	1.7	29
1929	33	41.5	16.7	0.9	27
1930	51	44.8	15.7	3.1	48
1931	33	45.9	17.5	1.3	20
1932	29	43.1	15.9	1.3	20
1933	19	44.6	16.1	0.8	15
1934	23	43.4	17.0	0.5	24
1935	80	46.8	17.8	2.0	51
1936	50	42.6	16.1	0.6	38
1937	49	46.1	17.2	2.5	27
1938	45	46.2	15.1	3.1	26
1939	46	48.6	19.7	3.6	35
1940	97	49.7	19.5	2.7	60
1941	40	45.4	17.2	1.8	17
1942	55	48.5	18.7	2.6	33
1943	52	50.6	19.8	2.7	32
1944	46	49.4	17.4	1.8	22
1945	57	49.3	19.7	1.4	20
1946	35	49.4	19.8	1.2	12
1947	33	50.7	19.3	1.7	12
1948	40	51.9	21.1	0.7	17
1949	28	53.9	21.4	1.5	10
1950	29	53.1	21.8	1.5	11
1951	35	56.0	22.8	1.2	11
1952	23	58.0	22.2	0.2	11
1953	31	57.5	18.9	0.9	3
1954	40	58.1	22.3	1.1	2
1955	30	56.5	20.2	0.7	4
1956	21	58.1	18.4	2.6	7
1957	37	60.8	20.4	1.3	5
1958	34	51.9	19.4	2.1	3
Total	1,404				825**
Average	40***	49.5	18.3	1.6	

Source: Ontario Mining Association statistics compiled in Paterson, Bulletin 173, 33.

*It is unclear why certain years have more miners who have died than were diagnosed with silicosis.

**This figure includes 63 deaths of cases diagnosed prior to 1926 not included in the table.

***Excluding 1926.

Table 6 - Statistics on Compensable Silicosis in Ontario, 1959-1974

Year	New Cases of Silicosis	Average age at Diagnosis (Years)	Average Dust Exposure in Ont. (Years)	Average Dust Exposure Outside Ont. (Years)	Died by 1972 (#)
1959	31	62.9	20.1	1.8	19
1960	33	61.6	18.2	1.1	16
1961	29	58.7	20.9	2.1	16
1962	21	60.1	21.5	2.7	9
1963	28	61.0	23.6	1.3	13
1964	22	63.8	22.5	0.5	10
1965	34	58.5	22.5	1.3	15
1966	39	57.8	19.5	1.8	17
1967	38	62.4	25.0	1.9	11
1968	39	59.3	22.8	1.1	8
1969	29	59.7	22.5	1.9	2
1970	33	65.2	20.8	1.9	2
1971	24	60.2	23.4	0.9	0
1972	31	50.4	15.8	2.4	0
1973	41	n/a	n/a	n/a	n/a
1974	37	n/a	n/a	n/a	n/a
Total	509				138
Average*	30.8	60.1	21.4	1.6	

Source: Ontario Mining Association statistics compiled in Paterson, Bulletin 173, 34: MAPAO, "44th Annual Report, May 1975," 18, AO F1352-2-0-4, OMA Papers, Royal Commission on the Health and Safety of Miners.

*Averages do not include data from 1973 and 1974.

Table 7 - Deaths of Silicotic Miners in Ontario, 1926-1972

Year	Deaths in Year	Average Age at Death	Average Dust Exposure in Ont. (Years)	Average Dust Exposure Outside Ont. (Years)	Average Time from Silicosis to Death (Years)
1926	8	43.6	13.3	0	3.0
1927	11	43.1	11.6	2.7	2.1
1928	12	42.0	9.7	0	2.9
1929	11	44.6	14.0	0	2.1
1930	11	45.6	14.4	0.3	3.5
1931	19	46.5	14.5	3.0	4.1
1932	16	46.7	12.9	1.6	5.3
1933	11	48.4	14.9	0.8	4.6
1934	22	50.8	15.1	1.8	6.0
1935	21	49.5	15.3	0.1	6.6
1936	14	50.0	14.3	0.9	6.5
1937	26	50.8	12.7	2.9	7.2
1938	12	51.4	14.5	0.2	7.6
1939	28	51.5	14.8	1.1	6.7
1940	28	51.2	13.5	1.6	8.7
1941	22	47.6	13.1	2.5	4.7
1942	25	55.2	15.0	2.0	8.9
1943	21	55.8	17.2	2.5	8.2
1944	29	53.9	15.7	0.8	9.1
1945	25	58.4	15.9	1.8	10.8
1946	24	58.3	17.9	4.2	9.9
1947	38	58.5	16.2	2.3	12.1
1948	39	57.8	17.6	1.6	11.0
1949	37	60.7	18.0	0.7	11.1
1950	25	58.8	19.2	2.5	8.4
1951	44	62.1	19.0	2.1	11.3
1952	30	59.8	15.1	4.1	10.3
1953	27	63.7	17.7	2.0	12.0
1954	34	64.7	18.9	2.7	13.0
1955	30	64.8	18.6	3.1	14.5
1956	48	63.7	20.5	4.6	12.8
1957	45	64.7	19.5	1.4	12.0
1958	32	64.8	19.5	2.2	13.3
1959	38	67.9*	19.3	0.9	15.0
1960	27	67.4	17.7	1.3	17.2
1961	40	69.0	22.4	1.7	15.5
1962	32	67.7	20.6	2.4	17.3
1963	36	65.5	19.4	1.3	15.3
1964	36	69.6	19.8	1.6	18.4

1965	37	69.0	20.6	1.9	15.2
1966	30	72.2	19.2	1.1	15.8
1967	46	70.0	20.1	1.2	15.3
1968	37	69.4	20.5	1.2	18.4
1969	37	69.1	20.2	1.9	17.6
1970	33	70.4	18.4	1.1	17.4
1971	25	72.7	22.5	1.1	20.3
1972	24	74.8	19.1	0.2	20.7

Total 1303

Source: Ontario Mining Association statistics compiled in Paterson, Bulletin 173, 35-6.

*Sudden increase likely reflects fact that statistics for 1959 and later were compiled in 1973, while those earlier than 1959 were compiled in 1959. This meant more long-lived silicotics were included after 1958.

Table 8 - New Early-Stage Silicosis Cases by Period (1956 data)

Period	# of Cases	Mean Age (Years)	Mean Dust Exposure Time (Months)
1927-29	7*	45	156
1930-34	182	43	189
1935-39	192	44	198
1940-44	196	47	213
1945-49	132	51	249
1950-54	54	54	237

*Most cases compensated in these years involved advanced silicosis.

Source: "Silicosis Medical Statistics, Ontario Mines - 1927 to 1954," [1956], AO RG13-20-0-99, Department of Mines, Mines Inspection Branch - Reports, Papers, and Proceedings.

Table 9 - New Early-Stage Silicosis Cases
by Year of First Exposure to Mine Dust (1956 data)

Period of First Exposure to Dust in Ontario	# of Cases	Mean Dust Exposure Time (months)
Before 1910	45	323
1910-19	221	245
1920-29	420	195
1930-39	66	137
1940-49	5	162
1950-54	2	88

Source: "Silicosis Medical Statistics, Ontario Mines - 1927 to 1954," [1956], AO RG13-20-0-99, Department of Mines, Mines Inspection Branch - Reports, Papers, and Proceedings

Table 10 - Silicosis Cases by Year of First Exposure and Year Compensated (1974 data)

Year of First Dust Exposure	Year Compensated:						Total
	Before 1970	1970	1971	1972	1973	1974	
Before 1930	1510	20	11	5	8	4	1558
1930-34	57	6	2	6	2	2	75
1935-39	29	-	4	1	3	7	44
1940-44	10	4	1	1	3	1	20
1945-49	17	2	3	8	7	7	44
1950-54	12	1	2	4	8	6	33
1955-59	9	-	1	6	10	10	36
1960-64	1	-	-	-	-	-	1
Total	1645	33	24	31	41	37	1811

Source: MAPAO, "44th Annual Report, May 1975," 18, AO F1352-2-0-4, OMA Papers, Royal Commission on the Health and Safety of Miners.

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