Miners, silica and disability: the bi-national interplay between South Africa and the United Kingdom, c1900-1930s

Arthur McIvor

School of Humanities and Social Sciences, University of Strathclyde, Glasgow, Scotland

Correspondence to: Arthur McIvor, BA, PhD History, School of Humanities and Social Sciences, University of Strathclyde, Glasgow, Scotland, 3rd Floor, Lord Hope Building, 141 St. James Road, Glasgow G4 0LT. E-mail: a.mcivor@strath.ac.uk

This paper investigates silicosis as a disabling disease in underground mining in the United Kingdom (UK) before Second World War, exploring the important connections between South Africa and the UK and examining some of the issues raised at the 1930 International Labour Office Conference on silicosis in Johannesburg in a British context. The evidence suggests there were significant paradoxes and much contestation in medical knowledge creation, advocacy and policy-making relating to this occupational disease. It is argued here that whilst there was an international exchange of scientific knowledge on silicosis in the early decades of the twentieth century, it was insufficient to challenge the traditional defence adopted by the British government of proven beyond all scientific doubt before effective intervention in coal mining. This circumspect approach reflected dominant business interests and despite relatively robust trade union campaigning and

eventual reform the outcome was an accumulative legacy of respiratory disease and disability that blighted coalfield communities.

KEY WORDS: Mining; silicosis; disability; medical knowledge; compensation; United Kingdom; South Africa

Introduction: Britain and South Africa in silicosis politics

Defining a disease as occupation-related, as Dembe [1996] has argued, is subject to a wide range of social, economic, political and cultural factors. Historians Rosner and Markowitz [1994] and Bufton and Melling [2005a] have shown how the politics of silicosis was complex, with a plethora of individuals and groups participating in the campaigns to attain recognition of it as an occupational disease and enforce preventative measures, regulation and extend compensation schemes. In mining, recent research [Lyddon, 2014; McIvor and Johnston 2007; Bloor, 2000] has emphasised the pivotal role played by the miners' trade unions and the way they effectively marshalled their own alternative 'lay' epidemiology and challenged medical orthodoxies. Within these debates and campaigns examples of 'best practice' elsewhere outside the United Kingdom (UK) played a part, not least in enabling the case to be made that unhealthy work processes had been identified through extensive and rigorous epidemiology, and that diseases like silicosis were capable of being tackled by rigorous state intervention without significantly undermining the competitiveness of an industry. This was the case with South Africa and the regulation of silicosis from the 1910s, which was held up as an exemplar in North America [Derickson, 1988, p. 86] and Britain. Hence, one British delegate to the International Labour Office Conference on silicosis in Johannesburg in 1930 (pulmonary disease specialist Professor Arthur Hall) described South Africa as 'the mecca for silicosis researchers' in *The Lancet* [Hall, 1930]. Similarly silicosis pathologist Professor E.H.

Kettle commented after the conference in the *British Medical Journal*: ‘the experience of South African workers [meaning medical researchers] was so great that considerable weight must be given to their views’ [Kettle, 1930, p. 780]. Four years after the conference Chief Medical Inspector of Factories Sydney W. Fisher referred to the seminal contribution of research in South Africa and in the ensuing discussion a commentator (William Cullen) referred to the pioneering of radiography on the Rand: ‘where collectively there has been more done than at any other centre in the world’ [Fisher, 1934-5, p. 23]. British pathologists like Stevenson Lyle Cummins at the Cardiff Medical School in South Wales explicitly compared the x-rays of South African silicotics with those of Welsh coal miners to demonstrate the similarities, whilst the British government’s health think tank, the Medical Research Council [1942, p. 151], also referred to the key role of South Africa in developing knowledge of silicosis.

Trade unionists and sympathetic Labour Party politicians also used the South African example in an attempt to cajole and shame the British government into action to extend the restrictive silicosis compensation scheme (introduced in 1918) to make it more inclusive, notably in relation to coal miners. Frequent references were made, for example, to the pioneering use of dust suppression methods in South Africa by mining trade union officials [Davies, undated, p. 6]. Playing the South African card is clearly evident in a dialogue in the House of Commons in February 1934 between the Labour Party disability rights activist David

Rhys Grenfell (representing Gower, South Wales) and the Liberal Party Secretary for Mines, Ernest Brown:

> Grenfell: Whether, in view of the prevalence of miners' phthisis in the coal-mining industry, he will consider the compulsory adoption of wet drilling-machines for boring in all operations for blasting and removal of stone in coal mines.
>
> Brown: The application of a general measure of the kind proposed to drilling in all kinds of stone would not appear … to be an appropriate remedial measure.
>
> Grenfell: In view of the enormous number of disablement cases reported at the present time, does not the honorable gentleman believe that it is the duty of his Department to provide means by which these cases can be avoided?
>
> Brown: The answer is that my first duty is to ascertain the facts… the honourable member will see that it is not possible to take the line that he suggests.
>
> Grenfell: Is it not the duty of the Department to follow in this case the example of South Africa, where death and disablement from miners' phthisis have been wiped out?
>
> Brown: It would be unwise to draw a comparison without full knowledge in both cases.

> Grenfell: Is not the knowledge fully within the possession of the Department now? The knowledge is available to us, and the Department should have it.
>
> Brown: There is a vast amount of knowledge, but it leads to varying conclusions on the part of men who are experts from various points of view.
>
> Grenfell: Is it not the case that in South Africa miners' lives have been saved, while in this country lives are being lost in large numbers?
>
> Brown: I could not admit that [Hansard, 1934].

This conversation is revealing at a number of levels. What might be highlighted is the way that the government in power denied the *extent* of the problem, cast doubt on scientific or technical solutions and could allude to a lack of consensus and of contested medical evidence and opinion as a riposte to the (albeit exaggerated) claims that another nation (i.e. South Africa) had conquered the scourge of silicosis. Similar references to South Africa as the exemplar of ‘best practice’ on silicosis continued to crop up to the 1950s [Minister of Pensions and National Insurance, 1955, p. 105; Trades Union Congress, 1958, p. 244] . How did this relationship evolve in the earlier twentieth century and how did the 1930 Johannesburg Conference contribute to understanding and policy-making in the UK?

Forging international links and deepening awareness

The links between South Africa and Britain in relation to workplace health and safety in mining were evident long before the 1930 Johannesburg conference, as was the existence of a serious respiratory disability problem in British mines. In the early twentieth century, however, this was almost universally considered to be an issue affecting metal miners and not the far more numerous coal miners [Bufton and Melling, 2005a; Mills, 2010; Morrison, 2010]. John S. Haldane's pioneering research in 1900-02 identified high levels of silicosis amongst the Cornish tin miners in South West England. These miners frequently migrated to work in South Africa's gold mines and remigrated back home when disabled to be cared for by family, or, in the last resort ended up in the workhouse [Derickson, 1988, pp. 77-78]. Haldane's work implicated dusty conditions abroad in South Africa as well as in Cornwall where miners worked with machine drills with little or no protection. Of 142 'lifetime' machine drill miners who died in one area in Cornwall (Redruth), 133 died of respiratory diseases, with the average age of death just 37 years. Non-machine miners lived on average 16 years longer to 53 years [Shufflebotham, 1914; Louis, 1902; Haldane, et al., 1904].

This was not the only deleterious connection with the 'unhygienic' and unhealthy mines in South Africa. Cornish tin miners also brought back intestinal worms which led to serious outbreaks of anklyostomiasis before First World War. This fuelled anxieties about in-migration of germs in workers' bodies that later extended to serious concerns about

the spread of tuberculosis (TB) in British mines by migrant workers, for example from Poland (to Scotland) and Eastern Europe [Oliver, 1925, p. 530; Burke, 1985]. Around the same time another South African disease transmission story emerged in the North of England. Thomas Oliver (perhaps the most famous of British occupational health researchers of this era) reported that large numbers of British miners returned to North East England from the Transvaal as a consequence of the protracted Boer War (1899-1902). Many had severe silicosis which Oliver put down to inhaling rock dust in South African mines [Shufflebotham, 1914, 589]. The South African government were aware of Haldane and Oliver's findings and that (together, as Rosental [2015] has argued, with growing 'political and media pressure' from the UK) triggered the first Transvaal silicosis enquiry and, from there, the first worldwide official recognition of silicosis for compensation in South Africa in 1912. This first study of the white 'European' gold miners in South Africa found 31.6% of underground miners examined to have 'miners' phthisis' and almost half (47.5%) of all machine drillers had the disease. It was estimated that 90% of the underground workforce would 'eventually' contract the disease and that TB rates amongst those with silicosis were three times higher than those who were healthy [Shufflebotham, 1914, p. 589].

Inhaling dust at work left an enormous legacy of disability and premature mortality in mining communities. Dust featured prominently in the UK government enquiry into occupational disease in 1906-7 that led to six diseases being added to the Workmen's Compensation Act

(which to date had only covered industrial injuries). One of the key factors that led to silicosis (or any pneumoconiosis) *not* being included at this point as an industrial disease under the Workmen's Compensation Act was medical disagreements over whether and to what extent this was a different and distinct disease from tuberculosis. It was also widely believed that improvements in ventilation in coal mines from mid-nineteenth century had eliminated fibrosis of the lung. The coal owners marshalled medical evidence from their company physicians to support this optimistic prognosis and some prominent occupational health specialists such as Thomas Oliver endorsed it. Business interests were mobilised in a policy of containment. In metal mining, nonetheless, the key role of research on silicosis being carried out in South Africa was acknowledged in Britain in the Royal Commission on Metalliferous Mines and Quarries in 1913-14 [1914, pp. 138-139], not least by Edgar Collis. There was also awareness of important research deriving from Australia and New Zealand [Morrison, pp.134-135].

So, the flow of migrant labour back and forth from the UK to South Africa stimulated research into silicosis in the early twentieth century. This reciprocal knowledge exchange led to some limited regulation, including the pioneering South Africa legislation of 1912 which recognised silicosis amongst metal miners for compensation. The need to suppress dust also found its way in to the UK Mines Act of 1911, though this was a vague recommendation and not enforced. It was the First World War that was critical in shifting the balance of power in the

UK necessary to provide a conducive environment for the recognition of silicosis as an industrial disease. Silicosis was first added as a prescribed disease to the UK Workmen's Compensation Act in 1918. Whilst an important watershed, this legislation was extremely limited in reality, with coverage only of certain factory-based trades such as tool grinders and pottery workers. Miners were excluded.

In the 1920s, as Bufton and Melling [2005b] have shown, growing concerns about the silicosis risk amongst miners was fuelled by new medical evidence and a campaign by workers' advocates, led by the South Wales Miners' Federation. In the anthracite coal mines of South Wales rates of respiratory disease were particularly high. In 1925 Hans Pirow (then an Inspector of Mines in South Africa) was appointed by the UK Health Advisory Committee of the Mines Department to investigate work conditions of rock drillers in coal mining districts in the UK [Mines Department, 1926, pp.38-39]. After returning to South Africa, Pirow was an influential South African delegate to the 1930 Johannesburg conference. This demonstrates the regard that South African expertise in this area was held at the time and growing concerns about the silicosis risk amongst the coal miners [Fisher, 1935]. Indeed the accumulating evidence around a cluster of health issues, including the miners' eye disease nystagmus, 'beat' hand, knee and elbow conditions and respiratory disease, led to the appointment by the British state of the first Medical Inspector of Mines (Sydney W. Fisher in 1927). This appointment was on the advice of the Government's Health Advisory Committee in recognition that '90 per cent of the claims paid

for occupational diseases are paid to men employed in mines and quarries' [Ministry of Power, 1927]. Significantly, in the discussions around this appointment in the archived Ministry of Power papers the cost to the industry of this loss (or 'inefficiency') was part of the discourse, as well as 'suffering'. There were calls for 'medical examination of all persons who seek employment in mines and the eradication of all unfit persons who have entered them' [Ministry of Power, 1927]. After substantial trade union lobbying and further accumulation of medical evidence Workmen's Compensation legislation relating to silicosis in Britain was amended in 1928 to include some provision for miners – though in its first iteration in the 1928 Workmen's Compensation Various Industries Scheme this was extremely restrictive (limited to miners drilling in stone and in rock with at least 50% silica content). Compensation was only given on death or permanent respiratory disability deemed as sufficient to prevent ever working again. This re-focus on the silicosis risk in mining in the later 1920s mirrored a wider preoccupation with the threat of workplace dust inhalation in the UK. The Merewether and Price enquiry on asbestosis was published several months before the Johannesburg Silicosis Conference and led directly to the first UK Government Regulations on Asbestos (in 1931).

Medical orthodoxies and the containment of risk at the 1930 Johannesburg Conference on silicosis

The British contribution to the 1930 Johannesburg Conference was significant, with the largest number of delegates (four) of the non-host countries. These were the afore-mentioned Dr Sydney W. Fisher, Medical Inspector of Mines, Dr Edward L. Middleton, Medical Inspector of Factories, Prof. Arthur J. Hall, University Professor and Chair of the Medical Research Council's Industrial Pulmonary Diseases' Committee and Prof. E.H. Kettle, a pathologist and silicosis specialist (responsible for important work testing the impact of dust inhalation on animals in laboratory experiments) based at the Medical School, University of London. As Rosental has noted in his contribution to this collection, the 1930 conference organisers requested Edgar Collis (1870-1957), but this recommendation was rejected by the British government in favour of its own civil servants and government committee members [Rosental, 2015]. Collis was amongst the best known of UK medical specialists on silicosis at the time, and was amongst those who were sceptical about the prevailing idea (supported by John S. Haldane) that coal dust was innocuous in miners' respiratory disease [Collis, 1919; Collis and Gilchrist, 1928]. Collis also had radical ideas about what he called 'the reclamation of the disabled' [Collis and Greenwood, 1921]. His absence was significant.

The 'core' knowledge being discussed at the 1930 Johannesburg Conference was that of the 20 years or so of experience in the South African gold mines with silicosis and the epidemiology, regulatory and

compensation responses. However, the considerable knowledge of silicosis research in the UK (and elsewhere) was also fed into the discussions and had an impact on the outcomes. The contributions of the British delegates are revealing as they exhibited a conservative and bureaucratic approach, reflecting the prevailing 'scientism' of the day. The notion that dominated was that something had to be proven, verified and irrefutably corroborated with epidemiological evidence before any remedial action could be taken. *Probabilities* based on actual lay evidence and experience within mining communities stood for little. The 1930 conference thus probably did little to affect the *practical politics* of the struggle to get silicosis properly recognised as an issue in mining in the UK in the 1930s. However, it does tell us a lot about prevailing discourses, beliefs and contested medical knowledge, whilst the exchange of information at the scientific and epidemiological level and the publicity the conference generated undoubtedly had *some* effect in raising the profile of the disease in the UK.

Amongst the points British delegate Edward L. Middleton made in his opening remarks to the conference was that serious disability and death could come after very short exposures to dust inhalation at work. One example he gave was of a silicotic with only two and half years' work experience in a dusty trade [ILO, 1930, pp. 26-27]. He declared he was not able to definitively determine a standard of air dustiness that was dangerous and welcomed discussion on this (significantly there was no recommended standard of airborne dustiness adopted at the conference). On two points he appears to have embraced prevailing

medical orthodoxies: Firstly, that other dusts (e.g., coal/carbon) acted as ‘restraining agents’ or ‘antidotes’ to silicosis and tuberculosis (following J.S. Haldane) and, secondly, that tuberculosis was the critical issue, postulating that ‘silicosis was not developed in a healthy lung’. The idea that inhaling coal dust had any prophylactic effect was immediately rejected by Dr Bohme, based on research amongst miners in Germany [ILO, 1930, pp. 38-39]. The final conference resolution on this firmly rejected Haldane’s theory of coal dust as an ‘antidote’ to tuberculosis, whilst calling for further investigative research [ILO, 1930, p. 95]. The conference defined silicosis clearly as a distinct occupational disease (and not as a type of TB) with discrete stages and a synergistic relationship to TB. As Rosental [2015] has noted, this was a major step forward and a key contribution of the 1930 Johannesburg conference.

Middleton’s submitted written report on Britain also underlines his conservatism. This was extensive at 96 pages [ILO, 1930, pp. 384-480] but of this, only eight pages dealt with mining. Middleton embraced the existing orthodoxy in emphasising that silicosis was prevalent in certain factories and in metal mining, but that where a respiratory health risk *existed* in coal mining it was only in specific operations involving working with silica-rich rock as distinct from an exposure risk across the entire underground mining labour force. Middleton’s paper identified the risks inherent in dry rock drilling and narrowly defined those exposed to risk in the ‘processes’ of ripping, blasting of roof, driving through rock

and drifts [ILO, 1930, p. 427]. This conservative strategy of containment was evident when he commented:

> Certain workers employed below ground in coal mines contract a disabling and even fatal fibrosis of the lungs… These cases, although at first sight they seem so varied, when reduced to main factors show that all the men worked for a certain time in rock [ILO, 1930, p. 429].

He continued with a cautionary note: 'It is impossible as yet to arrive at the true incidence of silicosis in the coalfields'.

The statistical data Middleton presented to the 1930 conference revealingly indicated the limited extent of preventative measures in operation (water and dust traps) which were supposed to be compulsory under the Mines Act of 1911 where mechanical drills were being used. What stands out is the blatant flouting of this legislation as in 60% of the mines surveyed no dust control measures were in place [ILO, 1930, p. 428]. This chimes with McIvor and Johnston's argument in *Miners' Lung* that statutory regulations and mines inspection systems were systematically disregarded – and much oral (and other) evidence supports this flouting of the law [McIvor and Johnston, 2007, pp. 246-259].This was partly a product of managerial power and authority to impose the will of employers – facilitated in the interwar Depression when mass unemployment prevailed in mining communities. This was also the consequence of a prevailing productionist workplace culture where high levels of risk were tolerated, through socialisation, policed

by peer pressure to act as ‘real men’ in a culture where ‘Stakhanovites’, or ‘big earners’ were exalted within mining communities. What is conspicuously absent from the discussions at the 1930 Johannesburg conference is any comment on power and workplace cultures; on workers’ agency and the constraints upon choice linked to the control exerted by mine owners and expressed through mine management. Irvine, Mavrogordato and Pirow’s comments that companies could find the costs of preventative measures prohibitive was about as far as any critique of company irresponsibility and misuse of power went [ILO, 1930, pp. 178-208]. The contributions of Britain’s contingent to the 1930 Johannesburg conference invariably define the dust risk narrowly, rather than inviting debate on the breadth and depth of risk – for example within the coalfields. They also did not dissent from what Rosental [2015] has termed the ‘truncating’ definition of silicosis which excluded the early stages of the disease from compensation (following the established pattern in South Africa). They also failed, as McCulloch has noted, to challenge medical orthodoxies and swallowed hook, line and sinker the South African public relations rhetoric of healthy and well regulated gold mines after two decades of state intervention [McCulloch, 2012, p. 77]. This was designed explicitly to ease their labour recruitment problems. The discussions were all about the experience of the minority of white miners in South Africa. Neither the lack of data on the more numerous black workforce (c200,000), nor the discourse that black workers were not affected because of the transient nature of their employment with high labour turnover, were effectively

challenged. Hall raised a question about this at the 1930 conference and Orenstein (Superintendent of Sanitation for the Rand Mines Ltd) responded that 'the incidence of silicosis… on natives was relatively low' and 'it could be assumed that intermittent employment gave considerable protection' [ILO, 1930, p.78]. A Medical Officer of the Rand Mutual Insurance Company (Dr Andrew Watt) added that: 'the natives do not breathe through their mouths and, therefore, were protected by a better filter than Europeans' [ILO, 1930, p. 78]. Contradicting this, the expert on the aetiology of silicosis in African mines (Mavrogordato) had made the point earlier in the conference that 'natives who were employed continuously developed silicosis more rapidly than Europeans' [ILO, 1930, p. 45]. As Ehrlich has shown, racialization in workmen's compensation law in South African mining persisted until almost the end of the twentieth century [Ehrlich, 2012].

After 1930, silicosis certifications rocketed massively in the UK amongst coal mining workers, notably in South Wales [Bufton and Melling, 2005a; 2005b]. Within a few years, moreover, it was recognised that apart from classic silicosis, coal miners were also suffering from a fibrosis of the lungs connected solely to inhaling coal dust. In an echo of the 1930 Johannesburg conference, all four British delegates – Fisher, Middleton, Hall and Kettle – were on the Industrial Pulmonary Disease Committee (IPDC) of the UK Medical Research Council from 1936 that investigated 'disease x' – a 'new' pneumoconiosis (or rather a re-discovered version of anthracosis or 'black lung'). Similar delays to accumulate irrefutable 'scientific' evidence followed and the outbreak of

Second World War intervened. Coal workers' pneumoconiosis (CWP) was officially recognised and scheduled under the Workmen's Compensation Act in the UK in 1942. This was the outcome of a combination of factors, including sustained campaigning by the mining trade unions, involving the accruing of an alternative body of 'lay' epidemiological knowledge [McIvor and Johnston, 2007, pp. 185-236; Bloor, 2000].

'Outcasts': Addressing the problem of disabled silicotics

In the 1930 Johannesburg Conference the voices of organised labour as advocates for diseased workers are marked by their absence, despite the fact that the International Labour Office and the International Stoneworkers' Federation were instrumental in setting the 1930 conference up. This was in marked contrast to the British CWP investigation from 1936 when from the outset the views of the miners' trade unions (as well as community doctors and physicians) were sought and fed in to the process of accumulating knowledge and evidence-gathering [Medical Research Council, 1936].

As in South Africa, to address what was perceived as the 'problem' of the silicotics, those certified with the disease by medical panels set up from 1919 in the UK were dismissed from their employment. This sacking policy appears to have divided the 1930 Johannesburg conference. On the one hand were those that supported sackings on the grounds that this removed silicotics from dusty atmospheres that would worsen their health further. To leave them in the job sucking in

the dust would equate, one delegate (Du Toit) argued, to ‘slow suicide’ [ILO, 1930, p. 82]. Others saw dismissal as justified on the grounds that the TB cross-infection risk had to be minimised. On the other hand were arguments that in the interwar Depression there were few alternative job opportunities for miners, especially older men, so unemployment and the deleterious physical and mental impacts of loss of work and income worsened their situation. Work could be bad for you, but unemployment was undeniably worse for health and well-being before the era of the Welfare State. Fisher made this point in relation to British coalfields, where unemployment levels were unprecedentedly high during the Depression [ILO, 1930, p. 83]. The 1930 conference decided on a compromise recommendation on this which supported dismissal where any TB was detected and with just silicosis (without TB) a policy where sackings of younger, less experienced workers was encouraged, with some flexibility to retain older workers – over 45 – in employment [ILO, 1930, p. 101]. The opportunity to declare an *obligation* upon industry based on social responsibility to provide alternative employment in dust-free occupations or full pensions was passed by, despite an Australian delegate (W.E. George) to the 1930 conference commenting that this was the prevailing policy in the mining community in Broken Hill where he was a medical officer [ILO, 1930, p. 83].

The increased medical surveillance upon workers which went along with the emerging silicosis compensation schemes in South Africa, Britain and elsewhere meant that workers’ bodies were now under unprecedented levels of scrutiny. The importance of pre-emptive

medical selection of the fittest workers was validated at the 1930 conference which adopted the resolution:

> The physique of the worker is a factor of primary importance. An initial medical examination to ensure a certain standard of physique should be generally adopted in those industries in which the risk of exposure to silica dust is great. Periodic medical examination of such workers is also essential [ILO, 1930, p. 101].

This was both intrusive and facilitated mine owners' efforts to maximise their output by cherry-picking the strongest workers and those least liable to be a compensation burden. Cost-cutting, profit-oriented efficiency lay behind this identification through medical examinations of the fittest and the weeding out of physically weaker workers as well as the disabled silicotics. The 1930 conference also picked up on the fact that there was much uncertainty and contestation over the impact that further dust exposure in employment could have on the progression of the disease [ILO, 1930, pp. 100-101]. There was also recognition at the conference that re-employment and rehabilitation schemes were uneven across industry and had been largely 'unsuccessful'.

In Britain, the policies endorsed in the 1930 Johannesburg Conference did little if anything to improve the predicament of disabled workers and particularly those with respiratory disease, including silicotics, pneumoconiotics and the tuberculous, who were routinely sacked from their jobs throughout the 1920s and 1930s. Stigma and prejudice faced

these ‘lungers’, as well as dire economic deprivation. As a consequence there was a real fear of medical examinations and a tendency to hide and work on through encroaching respiratory disability. As a Swansea doctor (H.R. Stubbins) who wrote his thesis on silicosis reported in 1936: ‘Most of the men are reluctant to be examined because if the Medical Board turns them down they lose their jobs and the amount of compensation is low’ [Medical Research Council, 1936, p. 191]. Where job opportunities existed and mine owners were of the welfarist persuasion (as for example with the Fife Coal Company in Scotland) alternative job opportunities could sometimes be found. Shifting such disabled men to ‘light work’ and to work on the surface (screening, grading and washing coal) was not uncommon. Such work commanded significantly lower wages, however, and was regarded by hewers as demeaning and a slight on their masculinity. Other silicotic miners found work in labouring jobs outside of the industry, generally poorly paid. What characterised this experience was a transition invariably from skilled to unskilled and more insecure, worse paid and less intrinsically rewarding work [Fletcher, 1948, pp. 1066-1067]. There is no evidence, however, that delegates to the 1930 Johannesburg conference recognised these emasculating mutations in identities. Moreover, in the 1930s Depression alternative work became much scarcer and the plight of the disabled worsened. The first Pneumoconiosis Research Unit (PRU) studies in the mid-late 1940s were devoted to sociological investigations of the lived experience of such disabled miners, described by PRU Director Charles Fletcher as ‘outcasts’. Numbering

more than 20,000 by 1945 in South Wales alone, the position of this disabled community across the South Wales mining villages was desperate. The PRU studies were influential in getting the dismissal policy reversed and silicotics and pneumoconiotics largely reabsorbed into the mining workforce by the early 1950s [Fletcher, 1948; National Joint Pneumoconiosis Committee, 1950]. State ownership of the industry from 1947 and improved rights for disabled people (enshrined in the Disabled Persons Act, 1944) facilitated this.

CONCLUSION

What is evident from this story around the interplay of research, advocacy and policy on silicosis between South Africa and Britain is that there was a significant exchange of knowledge across national boundaries on silicosis from the 1900s through to the 1930s (and beyond).This contributed to the recognition of silicosis as an industrial disease and the compensation systems and practices that ensued. Ultimately, however, the attempt to use the South African experience as a lever to cajole interwar British government's into action was unsuccessful, failing to penetrate the traditional defences of the state to wait until scientific evidence had accrued to prove the case beyond all doubt. The mine owners benefitted from this commitment to the status quo, from an outdated 'scientism' and from disagreements within medicine (that the mine owners fostered) about the etiology of work-induced respiratory disease amongst miners. For all its achievements in defining silicosis, the 1930 Johannesburg Conference on silicosis legitimised the status quo rather than fundamentally

challenging it. Moreover, by failing to tackle rehabilitation or support the idea of corporate responsibility for those disabled in the course of their employment the ongoing desperate plight of the dismissed disabled silicotics was ignored and perhaps even exacerbated. This cautionary and conservative approach was to characterise silicosis and other occupational diseases (including asbestos) through the 1930s and beyond. Workmen's Compensation schemes remained restrictive, excluding vast swathes of disabled mine workers in the 1920s and 1930s, including most coal miners, whilst an opportunity to identify and condemn the generic problem of dust generation in employment was spurned. A legacy of this was the accumulation of crippling and deadly respiratory diseases which contributed to making coalfields in the UK (and elsewhere) the most unhealthy and disability prone of all working class communities in the twentieth century.

ACKNOWLEDGEMENTS

This article has been written as part of the Wellcome Trust Programme Award (2011-16) ‘Disability and Industrial Society: A Comparative Cultural History of British Coalfields, 1780-1948’. It draws on the work of the research team: Anne Borsay, David Turner, Kirsti Bohata, Daniel Blackie, Mike Mantin and Alex Rees (Swansea University); Steven Thompson and Ben Curtis (Aberystwyth University); Vicky Long and Victoria Brown (Glasgow Caledonian University); Arthur McIvor and Angela Turner (Strathclyde University). I am particularly indebted to Angela Turner for her assistance in locating material.

REFERENCES

Bloor M. 2000. The South Wales Miners Federation, Miners' Lung and the instrumental use of expertise, 1900–1950. Soc Stud Sci 30 (1): 125–140.

Bufton M, Melling J. 2005a. Coming up for air: experts, employers and workers in campaigns to compensate silicosis sufferers in Britain, 1918–1939. Soc Hist Med 18(1):63–86.

Bufton M, Melling, J. 2005b. A mere matter of rock: organized labour, scientific evidence and British government schemes for compensation of silicosis and pneumoconiosis among coalminers, 1926–1940. Med Hist 49(2):155–178.

Burke G. 1985. Disease, labour migration and technological change: the case of the Cornish miners. In: Weindling P, editor. The social history of occupational health. London: Routledge.

Collis, EL. 1914-1915. Milroy lectures 1915. Industrial pneumoconiosis with special reference to dust-phthisis. Public Health, London 28:252-64, 292–305

Collis EL, Gilchrist JC. 1928. The effects of coal dust upon coal trimmers. Journal of Industrial Hygiene, 10: 101-110.

Collis EL, Greenwood M. 1921. The health of the industrial worker. London: Churchill.

Davies JH. Undated. Methods of preventing silicosis. In The prevention of silicosis and anthracosis. Cardiff: South Wales Miners' Federation.

Dembe A. 1996. Occupation and disease: how social factors affect the conception of work–related disorders. New Haven: Yale University Press.

Derickson A. 1988. Industrial refugees: The migration of silicotics from the mines of North America and South Africa in the early twentieth century. Labor Hist 29 (1): 66-89.

Ehrlich R. 2012. A century of miners' compensation in South Africa. Am J Ind Med 55: 560-569.

Fisher SW. 1934-5. Silicosis in British coal mines. Transactions of the Institution of Mining Engineers LXXXVIII.

Fisher SW. 1935. Silicosis in British coal mines. Colliery Guardian 150, 8 February: 251-253.

Fletcher CM. 1948. Pneumoconiosis of coal miners. BMJ, 1 (4561): 1065-1074.

Haldane JS, Martin J, Thomas RA. 1904. Report on the health of Cornish miners. London: Her Majesty's Stationary Office. Cmd 2091.

Hall A. 1930. Silicosis. The Lancet, 216 (5586): 655-658.

Hansard (Parliamentary Debates) HC Deb 06 February 1934 vol 285 cc959-60959 §60 and 61.

http://hansard.millbanksystems.com/commons/1934/mar/29/industrial-diseases-silicosis#S5CV0287P0_19340329_HOC_106. Accessed 20 November, 2014.

International Labour Office. 1930. Silicosis. Records of the International Conference held at Johannesburg 13-27 August 1930. (Studies and Reports Series F Industrial Hygiene No. 13). United Kingdom: International Labour Office (Geneva), 1930.

http://www.ilo.org/public/libdoc/ilo/ILO-SR/ILO-SR_F13_engl.pdf. Accessed 25 June, 2015.

Louis H. 1902. Mining. In: Oliver T, editor. The dangerous trades. London: Murray. p 530-532.

Lyddon D. 2014. Trade unions and the history of health and safety in British mining. Historical Studies in Industrial Relations 35:157-179.

McCulloch J. 2012. South Africa's gold mines and the politics of silicosis. Johannesburg: James Currey.

McIvor A, Johnston R. 2007. Miners' lung: A history of dust disease in British coal mining. Aldershot: Ashgate.

Medical Research Council. 1936. Committee on Industrial Pulmonary Disease. Minutes of Meeting in Cardiff, 17 June 1936. National Archives London, FD1/2884.

Medical Research Council. 1942. Chronic pulmonary disease in South Wales coalminers, Medical Studies. London: HMSO.

Mills C. 2010. Regulating health and safety in the British mining industries, 1800-1914. Aldershot: Ashgate.

Minister of Pensions and National Insurance. 1955. Report of the departmental committee appointed to review the disease provision of the National Insurance (Industrial Injuries) Act (Cmd 9548).

Ministry of Power Establishments Division. 1927. Correspondence and papers. 7. Mines Inspectorate, 1927-1937. National Archives, POWE 10/82: 26 January 1927; 9 February 1927; 15 June 1927.

Morrison S. 2010. The silicosis experience in Scotland. Saarbrucken: Lambert Publishing.

National Joint Pneumoconiosis Committee. 1950. Employment of pneumoconiosis cases. Paper 29. National Archives London, PIN20/118.

Oliver T. 1925. Some achievements of industrial legislation and hygiene. BMJ 2 (3377): 530-532.

Rosental PA. 2015. Truncating a disease. The reduction of silica hazards to silicosis at the 1930 Johannesburg Conference. Am J Ind Med (in press).

Rosner A, Markowitz G. 1994. Deadly dust: silicosis and the politics of occupational disease in twentieth century America. Princeton: Princeton University Press.

Royal Commission on Metalliferous Mines and Quarries. 1914. Volume II. Cmd 7477.

Mines Department. 1926. Report of the Safety in Mines Research Board.

Shufflebotham F. 1914. The hygienic aspect of the coal mining industry in the United Kingdom. BMJ 1 (2776): 588-591.

Trades Union Congress. 1958. Report of the Proceedings of the 90th Annual Trades Union Congress. London: Co-operative Printing Society.