

# Extra-Congress Submission

## 15.5 INCUBATING DEATH: WORKING WITH ASBESTOS IN CLYDESIDE SHIPBUILDING AND ENGINEERING, 1945-1990

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As time went on Jimmy became breathless on less exertion and was almost entirely bedridden, an oxygen cylinder always by his bed. During those months she began to appreciate that he really was a brave man; he knew what the future held, knew there was no future, and he accepted it without crumbling<sup>1</sup>

1999 is an historic year in the long campaign by occupational health and environmental pressure groups in Britain against asbestos. In November 1999 the British government finally extended the ban on blue / brown asbestos (crocidolite and amosite) to cover white asbestos (chrysotile), thus outlawing the import and manufacture of all types of asbestos in the UK.<sup>2</sup> This came a century from the first 'official' discovery of the dangers to health of asbestos by a government factory inspector in 1898 and the first medical diagnosis of a fatal case of asbestosis (1899), and almost 70 years after the first government regulations were implemented to regulate the asbestos dust hazard at work in 1931.<sup>3</sup> The legacy of asbestos is a long and grim one, with disablement and deaths due to rise over the next decade or so as a result of past exposure to this highly dangerous material. Clydeside is a particular black spot. This article provides a case study of the asbestos tragedy on the Clyde, investigating why asbestos-related disease rates were so high and how they came to be incubated in the shipyards and engineering factories of this region since 1945. It draws upon a Nuffield Foundation funded project that examines – through oral history interviewing - the causes and social impact of asbestos-related illness. The project utilises the client database of Clydeside Action on Asbestos - the principal support agency for asbestos victims in the west of Scotland. 21 individuals who have had direct experience of dangerous working practices were interviewed. A questionnaire format was deployed to give some consistency to the interviews and to avoid leading questions. However, wherever possible the interviewer let the respondents set the agenda. The end result is an eye-witness perspective on workplace health and safety in one of Britain's major industrial regions.<sup>4</sup>

### **The context: occupational health and asbestos**

Asbestos is the major cause of work-related deaths in Britain today, responsible for over 3,000 deaths each year.<sup>5</sup> This amounts to ten times the total number of fatalities through work-related injuries.<sup>6</sup> Asbestos deaths are primarily caused by occupational exposure, where deadly carcinogenic fibres are inhaled whilst at work. Recent estimates indicate that asbestos will have claimed between half a million and 1 million lives across Western Europe by 2025.<sup>7</sup> Relatively little is known, however, about the history of the asbestos tragedy in Scotland, whilst the history of occupational health and safety remains curiously under-researched.<sup>8</sup> Despite alarming recent statistics regarding asbestosis, asbestos related cancer and coal dust-related disease - and notwithstanding the public and media concern

over a persistently high industrial death rate - the history of occupational health in Britain has suffered relative neglect.<sup>9</sup> Up until now the focus has been upon socio-legal studies; and the history of occupational health in Scotland during the era of the Welfare State remains particularly neglected. The extent of this neglect is apparent in the fact that a recent book documenting 50 years of the NHS makes no mention of occupational health, while an edited volume by Steckel and Floud examining *Health and Welfare During Industrialisation* neglects to acknowledge the centrality of occupational health to the standard of living debate.<sup>10</sup> This disregard for occupational health has only been partially addressed by important research on the asbestos industry. However, much of this work (with the notable exception of Woolfson and Beck), in line with the bulk of research on occupational health history in general, has been largely confined to engaging with narrow aspects of the work/health interaction: such as the general attitude of the asbestos industry to health and safety, the relative danger of asbestosis in relation to other industrial diseases, or to legal implications or compensation issues.<sup>11</sup> There has been a general failure to place the interactions between work and health in historical perspective, and no consistent attempt has been made to use oral testimony to examine patterns of exposure at work, victims' attitudes, and the effects of industrial disability and death upon individuals, families and communities. Using such an approach, we hope to add a different dimension to the growing literature on the history of occupational health and thus increase our understanding of what it meant for ordinary working people to contract a life-threatening industrial disease.

The British State has been reluctant to become fully involved with occupational health, and despite protest from the trade union movement and the medical profession, no occupational health service was established as part of the NHS in 1948. Since the mid-1970s health and safety at the British workplace has been policed by the Health and Safety Executive (HSE), the Health and Safety Commission, and the Employment Medical Advisory Service. This superseded the Factory and Mines Inspectorate (FMI). However, some commentators have noted that the emphasis has tended to be more on worker *safety* than on workers' health, and that the FMI and HSE failed to protect the labour force from long-term health risks.<sup>12</sup> Further, it has been argued that the institutional separation of occupational health from general health provision meant that occupational health has been given much less priority within the NHS.<sup>13</sup>

Scotland has a long association with the asbestos industry. Scottish entrepreneurs were amongst the pioneers in developing the manufacture of asbestos products, with the first companies appearing in the 1870s. One account suggests that it was two Scottish businessmen who first introduced the mineral to the UK, establishing a company in Glasgow to manufacture asbestos in 1871.<sup>14</sup> Later that same year an engineer read a paper in Glasgow to the Institute of Engineers and Shipbuilders in Scotland on the uses of asbestos in steam engines.<sup>15</sup> By 1885 there were at least 20 asbestos manufacturers in Glasgow.<sup>16</sup> The importance of the industry in Clydeside in this early period is suggested by the fact that of 18 asbestos companies (undoubtedly the largest) listed in a UK Trade Directory in 1884, 6 were located in Glasgow.<sup>17</sup> The industry developed rapidly thereafter, especially on Clydeside. A Glasgow Directory listed 52 asbestos manufacturers, warehouses and agents and 26 boiler coverers in the city in 1900.<sup>18</sup> The shipyards and engineering companies were the major users of the product in West Scotland, with boiler and pipe covering companies emerging which specialised in thermal insulation. These companies had their own employers' organisation by the 1920s. One of the largest and most active of member companies was Newall's Insulation, a subsidiary of the major UK asbestos producer, Turner and Newall which had its base in Northern England.

### **Major thermal insulating companies operating in Glasgow , 1945-50**

Newall's Insulation Co.  
 Anderson's Insulation Co  
 Bell's Asbestos and Engineering Ltd.  
 R.S. Brown and Co.  
 The Scottish Insulation Co.  
 Drumoyne Asbestos Covering Co.  
 McAndrew Wormald and Co.  
 Cork Insulation and Asbestos Co.  
 Clyde Insulation Co.  
 Cape Asbestos Co.  
 James Walker (Insulators) Ltd  
 The Chemical and Insulating Co.  
 W. Beaton and Sons  
 Kitsons Insulators Ltd  
 Reid Parker and Co.  
 Neils Insulation Co.  
 Darlington Insulation Co.  
 Scottish Asbestos and Rubber Co.  
 J.D. Taylor and Co.  
 J. Muir and Son Ltd.  
 Donald-Bean Insulators and Engineers Ltd.

Source: Glasgow Master Boilermakers and Pipe Coverers' Association, *Minutes*, 16 April 1946 (Glasgow University Business Records Archive, UGD 339/2/41); *Post Office Directory of Glasgow, 1950-51*.

Asbestos imports into Scotland are not known, but some indication of the expansion of the industry can be gathered from the UK figures. Asbestos imports into the UK grew from the early years of the twentieth century, increasing from 21,000 long tons in 1924 to 54,000 by 1946, 142,000 by 1955 and to 173,000 long tons by 1965. This reflects the widespread use of the product in construction, the household, in shipbuilding and engineering for insulation and fireproofing. Amongst the main exposure points in Scotland were the shipyards, marine engineering, locomotive construction, motor engineering, maintenance and repair (friction products such as clutch and brake linings), heat engineering (including storage heater construction) and electrical engineering.<sup>19</sup> The shipyards were amongst the heaviest users of asbestos, which was used to insulate boilers and pipes and throughout ships to satisfy fire prevention regulations. The extent of the occupational exposure can be gauged from the fact that between Glasgow and Greenock on the Clyde there were 32 shipbuilding and repairing yards in operation in 1960. The *Queen Elizabeth 2*, built at John Brown's in Clydebank between 1965 and 1967 provides an example. Asbestos was used throughout the *QE2*, including all the ceiling panels and bulkhead linings, which were manufactured from Marinite, a fire-proof product manufactured by Cape Asbestos in Glasgow consisting of almost one-third asbestos.<sup>20</sup> More than 3,000 workers were employed in the construction of the *QE2* and many of these, across a whole range of trades (including ladders, joiners, plumbers, french polishers, plasterers and electricians), were exposed to asbestos dust.

Scotland appears to have a particularly poor occupational health record. Scottish workers are 79% more likely to take time off for bad health than the rest of the UK; general health standards are worse, especially on Clydeside, whilst HSE Reports indicate significantly higher rates of injuries and some industrial diseases in Scotland than England.<sup>21</sup> The most serious illnesses caused by exposure to asbestos are asbestosis, pleural plaques, pleural thickening, lung cancer, and mesothelioma. Asbestosis is scarring of the lungs by asbestos fibres and can take 15-30 years before any symptoms become apparent. The disease is progressive and incurable, causes pain and disablement, and may lead to heart or lung failure. Thickening of the pleura - the membrane between the lungs and the rib cage - is also caused by the inhalation of asbestos dust, and causes progressive breathlessness. Pleural plaques are isolated thickened areas on the pleura and can be painful and debilitating, especially where another asbestos-related disease is present. Mesothelioma was, until fairly recently, a rare form of cancer, and is almost wholly related to asbestos - 85% of sufferers having been in contact with asbestos. Mesothelioma can present up to 40 years after the victim's first exposure to asbestos. It results in a high degree of pain, and normally kills the sufferer within a year of diagnosis. Between 1968 and 1991, 1,020 Scots are known to have died of this condition. Lung cancer caused through working with asbestos is now thought to be the most significant work-related cancer in the world. The main difficulty is differentiating between cancer caused through cigarette smoking, and that due to asbestos. This is compounded by the fact that fatalities due to cancer are currently running 10% above the national average.<sup>22</sup> Moreover, it has been estimated that cigarette smokers who have also been exposed to asbestos have 92 times more likelihood of contracting lung cancer than non-smokers.<sup>23</sup>

Legal measures to protect workers from asbestos have been slow in evolving. The first recognition of the connection between asbestos and lung disease was made in 1898 by a factory inspector, Lucy Deane. However, asbestos in this early period, as Bartrip has argued, 'was not seen to be uniquely dangerous' and regulations to control the hazard were only introduced in 1931 after the Merewether and Price Report.<sup>24</sup> These were based on medical monitoring of workers, protection with masks and respirators and suppressing high levels of dust generation in workplaces through exhaust ventilation. These measures had an impact in containing asbestos related disease up to the 1960s, but there were critical flaws in the system. As Tweedale and Hansen have shown, the Medical Panels were far too conservative, suspending only the very worst cases, whilst allowing many partially disabled workers with impaired lung capacity to continue working where they would be further exposed to airborne asbestos fibres.<sup>25</sup> The asbestos manufacturing and insulation companies and those using the product – including the shipyards - continued to condone hazardous practices and the workplace exposure regulations subsequently proved to be inadequate because they failed to cover workers who were *indirectly* exposed to asbestos dust (for example, those working in the vicinity of asbestos ladders and sprayers). This is clearly evident in the oral testimony of Clydeside shipbuilding workers.

The discovery of cancer and mesothelioma linked to asbestos exposure in the 1950s and 1960s also led to further and tighter regulation, especially over the use of the more dangerous brown and blue asbestos.<sup>26</sup> The 1979 Asbestos Regulations – designed to protect those involved with the manufacture of asbestos - were superseded in 1983 by new measures that stipulated that any worker involved with asbestos insulation or coating be medically examined before commencing employment with a firm, and at a maximum of two year intervals thereafter. However, it was not until 1987 that the Control of Asbestos at Work Regulations finally acknowledged the full extent of the problem by ensuring that *all* workers exposed to asbestos (not just those in prescribed occupations) be subjected to

regular medical inspections. White asbestos, considered less insidious (partly because of its longer average fibre length), continued to be imported until 1999. This fatal delay in appreciating the extent of the danger was also reflected in the policy of the Health and Safety Executive (HSE). In the early 1980s a HSE mortality study of workers *thought most at risk* from asbestos revealed that 183 people in the survey group had died of mesothelioma. However, over the same period, the NHS had given almost 11,000 people palliative care for this type of cancer.<sup>27</sup> The focus, then, had been far too narrow, and the HSE had failed to pick up the wider health implications of industrial exposure to asbestos - amongst such diverse trades as plumbers, electricians, joiners, plasterers, welders, insulation engineers, dockers, lorry drivers and cleaners. Amongst those who have died of asbestos-related disease have been women whose only contact was washing their husband's asbestos-fibre impregnated work clothes. Others have died from environmental exposure, due to the widespread use of asbestos in buildings, including schoolteachers and cleaners. The closure of the asbestos companies also left a legacy which was a danger to public health. Turners Asbestos Cement factory at Clydebank closed in 1970, but left an asbestos waste pile six feet high and 20 yards long which continued to contaminate the community for more than a decade thereafter.<sup>28</sup> Widespread evasion of the health and safety regulations is indicated in the oral interviews with Clydeside shipbuilding and engineering workers that form the foundation of this study.

Moreover, the main asbestos companies were well aware of the dangers of asbestos, at least from the 1950s.<sup>29</sup> Turner and Newall pursued a policy of denial and minimisation of the risk, misinforming government regulators, trying to suppress research findings and paying out minimal levels of financial compensation whilst creaming off massive profits and paying bumper dividends to shareholders.<sup>30</sup> When in 1951 the Transport and General Workers Union claimed a wage rise for asbestos sprayers on the grounds of the 'uncongenial nature of the work' and 'because of danger to health', the Scottish Insulation Engineers' Association refused the claim, argued that 'there was no danger to health' and continued to employ inexperienced labourers on such work, giving them only one week's training.<sup>31</sup> This organisation continued to obstruct the passage of ameliorative legislation, co-ordinating activities with the English Thermal Insulation Engineers' Association and the asbestos manufacturers to oppose the extension of the Shipbuilding Regulations.<sup>32</sup> This successfully delayed statutory controls over asbestos use in the yards for more than a decade between 1945 and 1957. By 1957, at least 6 Clydeside asbestos sprayers employed by Newall's Insulation had contracted asbestosis.<sup>33</sup> Ten years later the number had risen to 53, and 14 had died.<sup>34</sup> As a consequence of this, in June 1967, 500 of Scotland's 700 insulating engineers went on strike over fears for their health. The strike was unofficial, and the men's union (TGWU) tried to get the men to go back to work so that formal negotiations could begin with the employers.<sup>35</sup> However, the dispute quickly spread, and most of Scotland's insulating engineers were eventually involved. Two weeks later, though, the men went back after accepting a wage increase to compensate for the dangers they faced - they also demanded that their jobs be upgraded from semi-skilled to skilled status.<sup>36</sup>

This is illustrative of a common thread that runs through this article: From 1945 to the 1980s, profits and wages took priority over workers' health and safety. This inevitably left a grim legacy. In 1991 alone, it was reported that the ladders branch of the TGWU on Clydeside had 46 fatalities linked to asbestos-related diseases.<sup>37</sup> In the 1980s, there were around 700 officially recorded mesothelioma cases in west Scotland alone, a situation which earned Glasgow the title of 'asbestos cancer capital of the UK'.<sup>38</sup> Cancer Surveillance reports and the research of Clyde Action on Asbestos clearly identified

significant geographical clustering of cases in the shipyard districts of Glasgow (especially Govan and Clydebank). Clydebank (a shipbuilding *and* an asbestos manufacturing centre) was a particular blackspot, having 512 times the UK average of mesothelioma cases in 1990 and more than six times the death rate from mesothelioma than the average across West Scotland.<sup>39</sup> Direct exposure of workers employed in Turner's Asbestos Cement Company in Dalmuir, Clydebank, contributed to this. The local community were also more at risk as a result of the asbestos waste tips around this works, as were the wives of asbestos and shipyard workers who came into contact with asbestos fibres from washing work clothes. A key factor, however, was that the more evidently carcinogenic blue asbestos was commonly used in the shipyards, including John Browns, because of its superior thermal insulating properties. White asbestos was a poorer insulator when exposed to sea water and was much more extensively used on land-based thermal insulation than in marine engineering and shipbuilding.<sup>40</sup>

### **Workers' testimonies: 'It fell like snow'**

Many of our interviewees were first exposed to asbestos in the shipyards and engineering factories of the Clyde. Working conditions in the shipyards were notoriously hard. A marine engineer who worked in Ailsa shipyard in Troon in the mid-1960s remembered quite clearly what it was like:

In the shipyards there was no health facilities there when I was there. There was nothing. If it was raining you worked out in it or did your best, you know. There wisnae even any toilets aboard the boats that you could use. But eh, oh, it was something awful. You just didnae think oh it. You just worked on.<sup>41</sup>

This reminds us that it is important to keep the asbestos problem firmly located within the context of what was already an unhealthy working environment, located in a relatively unhealthy, socially deprived region. The effects on workers' health and well-being were cumulative.

Most of the asbestos in the yards was used for insulation, and it was the insulation engineers - the ladders - generally employed by outside contractors, who were most closely involved with its use. Moreover, because of the nature of their work they were frequently required to work alongside other trades. One interviewee - now with pleural plaques - remembers his first days as an apprentice insulation engineer in Harland and Woolf's shipyard in 1970. One of his tasks was to mix asbestos paste known as 'monkey dung':

Sometimes they'd spray that on the bulkhead of a boat. And the sprayer would have a wee drum. So you'd just mix it up and stick it in the drum. Eh, you got a half pint of milk for that. It was a good bonus you know. A half pint of milk... That's what you were allowed, because they said that you would... Well, you would be a bit thirsty. So you were allowed a half pint of milk. I'll always mind of that. It was a half pint o milk and you got a paper mask. You know one of these wee paper masks. Eh, everybody's working alongside... You know, you've got a burner, you've got a welder, but *you* were fortunate 'cause you've got a wee paper mask on.<sup>42</sup>

Another ladder also remembers how his job put other tradesmen in danger:

We used tae insulate the boilers actually on the boat, and the place was covered in asbestos when we were dain that. And the same in the engine room... There were pipes everywhere... You used to saw the stuff. Well the, the, teased up stuff and the dust just a' floated. It floated round and everybody got their share.<sup>43</sup>

A ship's plumber now suffering from pleural thickening remembered how he was exposed to asbestos every day:

I was working in amongst it. Engine rooms, boiler rooms. And when they – you called them staggers then, it would be like scaffolders now – when they were erecting the scaffolding inside the ship, they would turn the batons. The batons would be full of it, and they would reverse them for, you know, for safety, anyone walking on them, and it used to come down like snow.<sup>44</sup>

This image of asbestos cuttings, dust, and dried-out 'monkey dung', coming 'down like snow' was a recurrent one amongst the interviewees who worked in the yards. For example, a boilermaker described his experiences thus:

I'm no exaggerating when I say this: it was like snow coming down, and there were nobody there to supervise them, and nobody there to say it.... And they were on staging the whole way up there... Now as you put the pipes up the insulators were following you. And the staging.... There was asbestos all over that an all, and it was all coming down on top of you.<sup>45</sup>

And a rigger who worked in Fairfields remembered clouds of asbestos dust caused by cranes lifting asbestos-coated pipes:

Now they were all covered in this 'monkey dung' as they called it. It was just asbestos. And when you were taking them down... I mean they were heavy big big pipes and you had to put wire strops on them to sling them, to move. When you put the wire strops on them, and the weight came on the wire strop, it bit into the 'monkey dung' and it all just crumbled, and it was like snow flying all over the place.<sup>46</sup>

Inevitably, in this work environment from the 1930s to the 1960s a wide range of shipyard workers inhaled the debilitating and potentially deadly asbestos fibres. The workplace was frequently recalled as enveloped in a 'fog' or 'haze'. For example, a retired marine engineer remarked:

You did all the engine room work. And then the asbestos men would be lagging them [pipes] up above you. And you could see it in the summer time. If you looked up before they put the engine room skylights in you could see this haze. And this was asbestos dust.<sup>47</sup>

A 74 year-old retired fitter - whose asbestos-damaged lungs only became apparent two years ago - described asbestos dust in the 1950s in this way:

I've seen times when you couldnae see the other side of the boat. That's only what? 40 or 50 feet away. You couldnae see it for the dust. The dust in the air. It was just like dust... Anyway, we had planks... We had planks all round the engine room... And they'd be covered in it too.<sup>48</sup>

Another marine engineer recounted how he became aware of the danger of the dusty surroundings when working at Upper Clyde Shipbuilders (UCS) in the late 1960s:

This one particular day sticks in my mind. I was working in a machinery compartment with this mate of mine. A shaft of sunlight came into the compartment, and we were working beside these ladders. And I remember seeing the air literally foggy. Thick with this asbestos dust. And it passed through my mind then, I thought 'this *cannot* be good for us.'<sup>49</sup>

In this period there was a widespread lack of understanding amongst the workforce regarding the extreme health risks inherent in the material they were handling.

Consequently, it was a common sight in the shipyards to see young workers playing with asbestos cuttings. One man, who was a labourer in the yards for several years in the mid-late 1960s, recalled this quite clearly:

They were throwing this ‘monkey dung’ about and that, and hitting folk in the passing just for a game you know. Nobody knew how dangerous it was. These blokes were lagged in it head-tae-foot and they made sure that everybody else was as well.<sup>50</sup>

The ship’s plumber also remembered playing with asbestos as an apprentice in the yards; and the marine engineer who worked at Ailsa shipyard - now suffering from pleural plaques – related this account:

They cut it above you, and the bit that they cut off sometimes it would drop. We used to throw that at each other. There was an old charge hand there, and he could hardly see. His eyes were nearly shut and his mouth was always open. And everybody called him skipper, that was his nickname. And we used to shout as boys ‘ho skipper its snowing’ and belt him with this stuff. Well he never bothered. He was the most docile old character. As long as you were working he didnae mind a bit of fun.<sup>51</sup>

Activity such as this was also remembered by a retired fitter who recalled shipyard workers ‘breaking it up and tossing it at one another.’<sup>52</sup>

Bearing in mind that the asbestos companies knew of the dangers at this time, it is sad to reflect that so little was done to minimise risk. The marine engineer who worked in UCS - and is now suffering from pleural thickening and heart problems – reflected on the role of safety officers in the shipyards in the late 1970s and early 1980s:

There were safety officers in the shipyards. Frankly, what they basically did I don’t know, ‘cause I never paid any attention to what a safety officer did. I mean, I suppose, straightforward things like if you were doing something silly the safety officer might come up and say to you ‘hey don’t do that that’s dangerous.’ But certainly, as far as asbestos went, no safety officer ever approached me and told me that asbestos was a dangerous substance. So I’m pretty certain they never knew either. I’m fairly certain that all the workers, including the foremen and managers never knew – ‘cause I’ve known foremen and managers who had asbestosis. No one was warned at all in the shipyards. The directors of the companies most certainly must have known, but eh, they didn’t inform anybody.<sup>53</sup>

Another shipyard lagger with asbestosis commented on this lack of knowledge and training:

I came into the lagging industry as a boy in 1952. I’ve worked for most of them – Capes, Newalls, Anderson Insulation. All the time I got no training whatsoever. We didn’t know to ask about the asbestos we were spraying. And the employers, well, they didn’t tell us.<sup>54</sup>

Several of the interviews provide hard evidence that even when safety procedures were put in place, they were not always adhered to. A retired sheet metal worker worked in various shipyards in the late 1960s:

I remember I went tae a ship, a City Line ship, and the fan had rotted away. The ventilation had rotted away but it was covered with asbestos. And I said - Captain Bailey was the man - and I said ‘I’m sorry captain I cannae touch that, it’s dangerous.’ So away I went back tae the shop tae report this. And by the time I got back they had been on to [his boss]. He never said a word tae me, but they had a couple of men who drank heavily, and he’d take them away, and the next thing you’d be told you could take that job. He’d just gave them a tenner and they stripped it. That was a system that was worked in that wee firm.<sup>55</sup>

A retired joiner remembers suddenly becoming aware in 1969 or 1970 - in Scotts shipyard in Greenock - that he had been endangering his life for years:



Well it a' started coming tae the front...And then they started talking about it, and brought out all these hoovers and face masks and everything else. Goggles, face masks...It started coming out that certain squads were put on the asbestos stuff, and they worked away from anybody else. This was when it first started really. And you were saying to yourself 'what the hell were we dain all these years?'<sup>56</sup>

However, as noted earlier, the time-lag between protecting workers who were actually handling the material, and those who happened to be working alongside them was lengthy. This was made clear by one respondent:

They never gave you a mask. Even in the late '80s, some of they car ferries that came in from the Clyde Dock Engineering. You'd go down and get a staging up and get a couple of men to remove deckhead plates, and you'd find blue asbestos or asbestos. And you'd go tae the manager and say to him 'this'll need tae be sealed off.' 'Aye OK, right, fine. Just leave it the now, I'll contact you.' And you'd get a call the next morning at nine o'clock: 'That area's safe. Come down.' They'd got guys in - scalers they were called. They just took it away and put it in bags, and that was it. And that was going on in about 1988 I think. And eventually somebody got a Factory Inspector in and they'd seal off the areas. But, eh, it didn't happen a lot. They'd seal off the areas and put the exhaust fans in with all the pucker cleansing stations and what have you. But when you walked about the ship, no one ever said 'wear a mask.'<sup>57</sup>

This was also the case in the Upper Clyde Shipbuilders as the marine engineer recalls:

They didn't even tell you to wear a scarf around your mouth. And. It must be stressed I know now - not so much back in the '50s when I served my time with Barclay Curle, 'cause I'm not sure that they knew then that asbestos was a deadly substance. But bye God they knew when I worked in Fairfields. It was known then to these people that asbestos was a deadly substance, and still they never gave us masks to wear and we were exposed to that stuff. Not even the ladders wore masks. So everybody that worked close to these guys, no matter what they were - be they electricians, marine engineers, ladders, or whatever - were exposed to that.<sup>58</sup>

Real improvements in asbestos safety only became apparent in the mid-1980s after media attention became focussed on the problem.

The perceptions of our interviewees on the role played by trade unions are interesting. All of our respondents who worked in the shipyards testified that the trade unions did little before the 1980s to protect workers from asbestos. Our ships' plumber was asked to comment on the trade unions and health and safety: 'The nearest thing was the shop steward. And as regards safety, all that was ever mentioned was getting rises or bonus. But safety? No'.<sup>59</sup> The retired fitter took an even more jaundiced attitude: 'They never done anything. They just kept their mouth shut. Must have been silenced by the companies'.<sup>60</sup> However, one interviewee - who later became shop steward convenor for the Clydeside region - noted that the asbestos problem had to be kept in perspective:

Its all right in hindsight. But, you know, we were that busy at that particular time trying to fight for survival of the yards entirely, cos we knew that heavy industry was slowly crumbling.<sup>61</sup>

With few exceptions, the interviewees reported a general disgruntlement with trade unions and health and safety. At the end of the day, though, only concerted action would have been effective. A boilermaker plater remembers being involved as a trade union safety representative, and he recalled the difficulty he had in mustering support for the asbestos issue:

I was in Barclay Curles there, and they brought out a new system and they had to have a safety man. ... And I was recommended to be the safety man on the ship there, and they had a meeting every month...I was the only man that was in the ship. And when we got up there, there was an insurance man and everybody gave their opinion of what was dangerous. And I brought up asbestos. But at the same time the men that were in the engine shop, they werenae involved with asbestos...and you couldnae get the backing of them.<sup>62</sup>

As noted earlier, the asbestos tragedy on the Clyde must be seen against the perspective of a hostile working environment in which occupational health was marginalised for the sake of profit. The trade unions that operated in the yards - according to our interviewees - did not pay much attention to occupational health risks. To some extent, and especially in the earlier part of the period (c1945-70) this was the product of ignorance of the deleterious effects of asbestos, a machismo work culture and the relative weakness of unions operating in a wider context of de-industrialisation and a multiplicity of workplace hazards. A Clyde shipyard convenor summed this up quite succinctly:

Nobody attached great importance to asbestos. They knew it wisnae good for your health, but there was so many things in shipbuilding that were bad for your health. I mean if you've got a guy in a double bottom welding. He's only got about two feet, and he's crawling in between, right in the double bottom of the ship, and he's in a wee confined space no bigger than that settee you're sitting on, and welding, and burning you know, and all those fumes and everything you know. So there's so many, that it [asbestos] was only one - what would you say - obstacle you've got to overcome when you're in shipbuilding. When you saw the conditions on the Clyde it was like fighting an atomic war with a bow and arrow. You didnae have a chance.<sup>63</sup>

Given this context, it is perhaps not surprising that the unions tended to prioritise financial compensations over really effective preventative measures. The aim was to get maximum rewards for putting up with notoriously poor working conditions. Several of the ladders who spoke to us told us that their firms gave health and safety a low priority, and that rules were frequently broken in the name of profit. A heating engineer recalled the slip-shod procedures in the mid-1970s:

If we went down tae strip a boiler we just took it [the asbestos] off with a hammer and chisel, you know. There was nae masks or anything at that time, you know. If you came out for a breather they were asking you what you were dain sitting outside, you know. You were spitting up black for maybe a week, you know, when you came out.

He noted that it was not until the mid-1990s that his firm began taking asbestos safety seriously; and he recalled his first lecture by a trade union safety representative on the subject:

I finished work when?...a year past in May. Just about a year before that they came up and gave us a lecture on asbestos. I said you're a wee bit late in the day. I mean that's 1996, 1995. 'Oh' [they said] 'but this is just tae bring it up.' I said 'health and safety? We're kidding ourselves on here aren't we?'<sup>64</sup>

One of the sad things about this occupational health tragedy is that as asbestos became utilised more frequently on Clydeside, many derived a good living from working with it. A ladder remembered how in the immediate post-war period the joiners began to jump on this lucrative band wagon:

They wanted our work. When we started using cleaner looking stuff, they said 'well, we've been doing this and doing that.' So they were starting to use Marinite

[manufactured by Cape Asbestos]. It was nice. It was formica on the outside, but inside it was solid asbestos. So when they were sawing that with...What dae you call it? Rip saws and that. You couldnae see them for dust. So I know for a fact that a lot of the joiners...I worked with quite a lot of them. They kept encroaching and encroaching and they wanted intae this asbestos as it looked a bit clean. But the unfortunate thing is that it done a lot of them in.<sup>65</sup>

Some rank and file union activists did attempt to get the asbestos hazard addressed. The Glasgow ladders branch of the TGWU (branch 7/162) first raised the issue during World War Two. In 1944-5 the trade unions and the Shipbuilding Employers' Federation accepted new *voluntary* and *precautionary* recommendations, which included the provision of respirators and non-employment of juveniles (under 18) on asbestos work, including spraying.<sup>66</sup> However, efforts by the TGWU to obtain extended training for asbestos workers and effective *statutory* protection were met with refusals to negotiate an industry-wide scheme by the Scottish insulating employers in the 1950s, who persistently reminded the union that ladders and sprayers were not covered by the 1931 Asbestos Regulations.<sup>67</sup> The TGWU also proposed a scheme of regular medical inspection for asbestos ladders to the employers in 1962, but this does not appear to have been acted upon for several years. In 1967 the ladders branch took matters into their own hands and struck work, demanding wage rises, protective clothing and regular medical examination (detailed above). This prompted some reforms, including a medical examination and the creation of a joint health committee. The branch continued to agitate for more effective action, but found their campaign undermined by lack of interest in the 1960s and 1970s within the higher echelons of the STUC. Despite an active interest in health, welfare and the environment, a systematic trawl of the STUC *Annual Reports* indicate that there were no initiatives taken on asbestos at this level before the 1980s. E. Kelly, a Clydebank Trades Council delegate to the 1984 STUC Congress, commented on an incident which signifies much about prevailing attitudes within the trade union movement:

Several years ago at an STUC Congress in Perth a trade union branch, due to a misunderstanding, was allowed to distribute a circular to Congress on the hazards of asbestos and how it affected our members, 22 of whom at that time had died of asbestos-related diseases. When the error was discovered we were told, quite correctly, to dispose of them. What happened next was symptomatic of my experience of working in the building and the shipbuilding industry, of the different levels of acceptance of information regarding the dangers of asbestos. Many of the delegates put the circular into their folders or pockets; other crumpled them up and dropped them on the floor. Some tore them up and one, who is now a Shadow Government spokesman, rather slowly stood up, raised the circular above his head, then tore it and let the pieces fall like confetti to the floor. There you have acceptance, indifference and antagonism.<sup>68</sup>

This made it easier for the employers to subvert their own agreed 1967 voluntary code. There were no follow-ups of the initial medical examination for more than a decade and the joint health committee fell into abeyance, meeting infrequently through the 1970s.<sup>69</sup>

So, economic imperatives, the desire to maximise profits, employer negligence and supervisory bullying - combined with the offer of tempting financial incentives - all operated to subvert safety standards and expose workers to life-threatening levels of inhalation of asbestos, long after the dangers of working with this highly toxic substance were known. Whilst there was some workplace action and activist pressure, notably amongst the well-organised ladders, the union movement prioritised job security and wages over occupational health.<sup>70</sup> Without a strong trade union lead, workers were

relatively powerless to resist managerial pressure to cut corners. Moreover, the insecure labour markets characteristic of Clydeside during de-industrialisation after World War Two made it more difficult for the workers to object to unsafe practices, whilst a deeply ingrained machismo work culture contributed to workers' own neglect – tragically some workers refused medicals. A 51 year-old interviewee (involved with spraying asbestos in the 1960s) told us that safety procedures were occasionally set aside for the sake of speed. For example, although the spray machinery incorporated two dampening operations to cut down asbestos dust – first by immersion in a tub, and secondly by soaking at the spray nozzle itself – to save time when on bonus work the first operation was frequently missed out. This respondent also told us that although sprayers were told to wear masks, they were heavy and uncomfortable to wear in a hot environment and were sometimes discarded.<sup>71</sup>

Therefore, when a choice had to be made between money on the one hand and health and safety on the other, the oral testimony suggests that it was normally the latter that lost out. Perhaps the health risks appeared deceptively distant and the need for cash in hand more immediate and pressing. An insulation engineer remembered stripping asbestos from a mine shaft in a Fife colliery. In this case the asbestos was too far down the shaft to render it less dangerous by soaking, and the men were asked to dry strip it. However, they were also told not to let the miners know what they were doing:

That was one thing we kept quite. Obviously you couldnae have what you would call a wet strip... We didnae have eh, strips of hoses tae run as far as that. So we were told 'just take it aff. Just stick it.' You were supposed tae put it in a black bag; then another bag; then a red bag with asbestos on it. But obviously we were told 'just miss out the red asbestos bag.' We would wait till they [the miners] were away down the shaft.

He went on to recount a conversation he had at this pit with an old miner regarding the relative dangers of their jobs:

By this time they'd introduced the regalia, you know you put the red suit and the mask and that on. But we werenae letting the miners know what we were dain. And I'll always mind a comment that an old guy made tae me. He says tae me 'you must be hard up for a job son.' I said 'how do you make that out Pop?' He says 'I see you with a' that stuff on.' ... They had a tonnage thing, and that was the bonus for that week. And eh, I says 'what does that represent?' And he says 'we've earned a good bonus.' And I says 'how much will you get out of that?' And I think he says it was about 75 quid. I didnae have the heart tae say 'by the way, I get that in expenses.' I was just comparing it, you know? That he was down there in the shit that he was, and he thought that *I* had a dangerous job.<sup>72</sup>

It needs to be emphasised, however, that it was invariably a combination of labour market pressure, employers' disregard for workers' health, weak and ineffective safety regulations (much of it voluntary) and policing systems, the prevailing wage system and long-term acculturation to dangerous work practices which were responsible for the health and safety of asbestos workers being compromised. The small scale of much insulation work and the itinerant nature of the employment made matters worse.<sup>73</sup> The failure of the trade unions to prioritise occupational health prior to the 1980s also contributed, though this perhaps needs to be understood in relation to the prevailing economic environment.

Although visits from HSE personnel would have been noticed more by the employers than the workers, we nevertheless asked all our interviewees to comment on their experiences with the principal government agency concerned with work place safety. Hardly any of them had ever seen or been aware of a workplace visit by the HSE. A retired

heating engineer first expressed his disappointment at his trade union's emphasis on hours and wages, then had this to say regarding HSE inspections of building sites:

We got a visit now and again but to me they were forewarned. I think so, because eh, when the site was getting tidied up, and all of a sudden the hard hats had tae be worn you know? So you knew there was somebody coming.<sup>74</sup>

The shipyard shop steward convenor also noted the limited role played by the HSE, and especially in relation to safety rather than health:

It was more accidents, you know, is the staging safe? Are you using proper ropes? Proper wires? They would check periodically, but you never heard anything about internal breathing or anything like that you know?<sup>75</sup>

And our marine engineer from Ailsa shipyard could not remember a visit from the HSE in all his time there. Only when he moved on to an engineering shop away from shipbuilding did he come across the HSE.<sup>76</sup>

## Conclusion

Some caveats have to be made before drawing tentative conclusions from this study. The research is incomplete, including the oral interviews. More work on the surviving documentary evidence and more interviews are the aims of the next phase of the project. Almost all the pilot study interviewees were drawn from the database of the main Clydeside asbestos sufferers' support group. Thus the respondent's views – for example on the role played by the trade unions - may not be entirely representative of the Clydeside workers in shipbuilding and engineering in general.

However, despite these caveats, the interviews give us an insight into several important issues. Firstly, the testimonies suggest that the principle of shared responsibility, enshrined in the 1974 Health and Safety at Work, Act failed to protect Clydeside shipyard and engineering workers from a considerable risk to their health and well-being. The assumption that employers and workers would work together to ensure workplace health and safety was naive - especially when the system was only loosely policed by the government through the HSE and, previously, the Factory Inspectorate. Most of the interviewees reported that workplace health was marginalised by the trade unions and the employers; and some reported how the workers themselves sometimes disregarded health and safety procedures. This is connected with an intensely masculine work culture, which merits more attention in itself. Consequently, more rigorous compulsion by the government on the employers to maintain higher standards of workplace health was required. Only through compulsion would the prioritisation of profits over workers' health by Clydeside shipbuilding and insulation employers and the prioritising of wages and job security by the unions (and some workers) over health, be broken down

There were also serious flaws in state policies, leading directly to the dual problems of inadequate financial recompense for injuries through either the legal process or the benefit system. This, combined with physical impairment, meant that industrial disability was liable to throw victims and their families into social exclusion.<sup>77</sup> There was also a deeper flaw running through the whole system of workplace health provision. For, had occupational health been given a higher priority within the NHS, it is likely that the time-lag between the growth of medical knowledge of the dangers of asbestos, the passing of protective regulations, and the subsequent implementation of these regulations at the work place, would not have been so long.<sup>78</sup> Consequently, the asbestos death toll would probably not have been as high.

However, the main conclusion to be drawn from this pilot study is that an oral history methodology is especially useful for gaining insight into and an understanding of workplace health issues, and of workplace culture in general. The testimonies help us place the asbestos issue within its workplace context: Before the danger was realised asbestos 'fell like snow' from above, hung like a fog in shafts of sunlight, and was something to be fooled around with. Clydeside shipyard workers were hardened by the volatility and insecurity of their industry and socialised into acceptance of a high degree of risk. Indeed this was internalised in a machismo work culture in the shipyards where complaints were frowned upon as an expression of weakness. Sadly, moreover, the impact of the knowledge of the health risks of asbestos was tempered by it being only one hazard amongst many: 'It was like fighting an atomic war with a bow and arrow.' Oral testimony brings forth clear evidence that life-threatening practices continued within the workplaces on Clydeside long after the dangers of asbestos were known and safety regulations introduced. Indeed, such evidence casts serious doubt on the effectiveness of voluntary industry regulation and state intervention to control exposure to asbestos in the workplace from the original measures of 1931 right through to the end of the 1980s. Such experiential testimony also provides evidence of varying attitudes, emotions and behaviour on the part of workers in reaction to the asbestos threat, ranging from outright resistance, to cynical bitterness and stoical acceptance of such hostile working conditions, mediated at times through the black humour characteristic of Clydeside workers.

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## References

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<sup>1</sup> Meg Henderson, *The Holy City* (Flamingo, 1997), p 267.

<sup>2</sup> A voluntary ban on the import of blue asbestos imposed by the industry in 1970-2 was followed in 1984-5 by a statutory ban on the import of blue and brown asbestos, manufactures containing such asbestos and any work with such asbestos. This was in response to European Community Directives. There are some exceptions to the 1999 ban that still allow restricted use of white asbestos, for e.g. the nuclear industry.

<sup>3</sup> G. Tweedale and D.J. Jeremy, 'Compensating the Workers: Industrial Injury and Compensation in the British Asbestos Industry, 1930s-1960s', *Business History*, 41, no. 2, April 1999, pp. 101-2.

<sup>4</sup> The next phase of the oral history project focuses on Scottish coal miners and pneumoconiosis.

<sup>5</sup> G. Tweedale and P. Hansen, 'Protecting the Workers: The Medical Board and the Asbestos Industry, 1930s-1960s', *Medical History* 42, 1998, p. 439.

<sup>6</sup> Health and Safety Commission, *Health and Safety Statistics, 1997-8* (1998), table 1.1

<sup>7</sup> *Hazards*, 65, Jan-March 1999, p.2.

<sup>8</sup> Studies include C. Woolfson, J. Foster and M. Beck, *Paying for the Piper: Capital and Labour in Britain's Offshore Oil Industry* (1996); A.J. McIvor, 'Work and Health, 1880-1914', *Scottish Labour History Society Journal*, 24, 1989

<sup>9</sup> P. Bartrip, *Workmen's Compensation in 20<sup>th</sup> Century Britain* (1987); A. McIvor, 'Manual Work, Technology and Health, 1918-1939', *Medical History* 31, 1987; A. Wohl, *Endangered Lives* (1983); P Weindling (ed.), *A Social History of Occupational Health* (1985).

<sup>10</sup> G. Rivett, *From Cradle to Grave 50 Years of the National Health Service* (1998); R. H. Steckel and R. Floud (eds.), *Health and Welfare During Industrialisation* (Chicago, 1997).

<sup>11</sup> M Greenberg, 'Knowledge of the Health Hazards of Asbestos', *Social History of Medicine*, 7, 1994; D. Jeremy, 'Corporate Responses to the Emergent Recognition of a Health Hazard in the UK Asbestos Industry.' *Business and Economic History*, 24, 1995; G. R. Wagner, 'Asbestosis and Silicosis', *The Lancet*, 10, 61, 1997; N. Wikely, 'Turner and Newall: Early Organisational Responses to Litigious Risk', *Journal of Law and Society*, 24, 1997, pp. 252-275; T. Gorman, A Case Study of the Settlement Process, in *Sourcebook of Asbestos Diseases*. See also C. Woolfson and M. Beck, 'Fatal and Major Injuries to Employees: The Scottish Anomaly', unpublished paper to the Scottish Trade Union Research Network Conference, July 1999.

<sup>12</sup> H. Jones, *Health and Safety in 20<sup>th</sup> Century Britain* (1994); D. Eva, and R. Oswald, *Health and Safety at Work* (1981); S. Harvey, *Just an Occupational Hazard?* (1988); K. Bunt, *Occupational Health Provision at Work* (1993).

<sup>13</sup> S. Harvey, *Just an Occupational Hazard?* (1980), p. 22; J. McEwan *et al*, 'The interface between the occupational health service and the National Health Service.' *Public Health*, 96 (1982), pp. 156-163

<sup>14</sup> A.L. Summers, *Asbestos and the Asbestos Industry* (1919), p.10.

<sup>15</sup> St-J. Vincent Day, 'On Asbestos', Institution of Engineers and Shipbuilders in Scotland, 5 December, 1871 (Glasgow, 1872).

<sup>16</sup> *Post Office Directory of Glasgow, 1884-5*, p. 888.

<sup>17</sup> *Kelly's Directory of Merchants, Manufacturers and Shippers (England, Scotland and Wales), 1884*, p 185.

<sup>18</sup> *Post Office Directory of Glasgow, 1900-01*. An additional 11 asbestos manufacturers were listed in pre-1914 directories for Aberdeen (7) and Edinburgh (4).

<sup>19</sup> One Clydebank respondent recalled working with asbestos in Singers in the late 1960s. It was used to insulate the electric motors.

<sup>20</sup> Testimony of Robert Dickie, QE2 joiner, cited in I. Jack, *The Sea* (1998), p. 208; see also, *Glasgow Herald*, 21 May 1994 for details of a successful case made for compensation for a QE2 french polisher who

died of asbestos-related cancer. See Clydebank Library Press Cuttings files. We are indebted to Pat Malcolm of Clydebank Library for these references.

<sup>21</sup> M. Beck, Unpublished paper given at Hidden Hazards of Work Conference, Western Infirmary Glasgow, April 1999; Woolfson and Beck, 'Major and Fatal Injuries'

<sup>22</sup> M. Beck, Unpublished paper given at Hidden Hazards of Work Conference, Western Infirmary Glasgow, April 1999.

<sup>23</sup> H. De Vos Irvine, Unpublished paper, *ibid.*

<sup>24</sup> P. Bartrip, 'Too little, too late? The Home Office and the Asbestos Industry Regulations, 1931', *Medical History*, 42, 1998, pp. 421-38. For an alternative and much more critical perspective on the early regulations see N. Wikeley, 'The Asbestos Regulations, 1931: A Licence to Kill', *Journal of the Law Society*, 19, 1992, pp. 365-78, and Tweedale and Hansen, *op. cit.*

<sup>25</sup> Tweedale and Hansen, *op. cit.*

<sup>26</sup> Mesothelioma was added to the list of compensatable occupational diseases in 1966 and asbestos-related lung cancer in 1985. Asbestosis was a prescribed disease from 1931, though compensation remained inadequate, as Tweedale and Jeremy (*ibid.*) have shown, throughout the 1930s to the 1960s.

<sup>27</sup> HSE, *Occupational Health Decennial Supplement* (1997), p. 2.

<sup>28</sup> *Scotsman*, 4 June 1980

<sup>29</sup> See G. Tweedale, *Magic Mineral to Killer Dust: Turner and Newall and the Asbestos Hazard* (Oxford, 2000)

<sup>30</sup> Tweedale and Jeremy, *op. cit.*, 116-117; *Scotsman*, 15 July 1993

<sup>31</sup> Scottish Insulating Engineers' Association (SIEA), *Minutes*, 28 March 1951; 11 April 1951

<sup>32</sup> SIEA, *Minutes*, 2 November 1950; 11 June 1958

<sup>33</sup> Chase Manhattan Papers, Newall Insulation Company Ltd., Asbestos Cases 1930-1957 (Clydeside Action on Asbestos Archive).

<sup>34</sup> *Glasgow Herald*, 24 Feb., 1967, p. 24.

<sup>35</sup> *Glasgow Herald*, 13 June 1967, p. 11.

<sup>36</sup> *Glasgow Herald*, 19 June, 1967, p. 16.

<sup>37</sup> *Sunday Mail*, 1 March 1992

<sup>38</sup> A.J.P. Dalton, unpublished paper, 'The UK Campaign to Ban Asbestos' (1999). See also A.J.P. Dalton, *Asbestos, Killer Dust* (1979)

<sup>39</sup> *Scotland on Sunday*, 7 August 1994. In reality, the figures were much higher because of mis-diagnosis and under-reporting. See

<sup>40</sup> K. Constantinidis, 'Asbestos Exposure', *British Journal of Clinical Practice*, June-Aug 1977, no. 7, p. 90.

<sup>41</sup> Scottish Oral History Centre, Strathclyde University, Asbestos Archive, Interviewee A15

<sup>42</sup> Interviewee A16. Speakers' own emphasis.

<sup>43</sup> Interviewee A14.

<sup>44</sup> Interviewee A2.

<sup>45</sup> Interviewee A3.

<sup>46</sup> Interviewee A18

<sup>47</sup> Interviewee A15.

<sup>48</sup> Interviewee A14

<sup>49</sup> Interviewee A12

<sup>50</sup> Interviewee A19.

<sup>51</sup> Interviewee A15.

<sup>52</sup> Interviewee A14

<sup>53</sup> Interviewee A12.

<sup>54</sup> Arthur Rhodie, certified 30% disabled by asbestosis, cited in A.J.P. Dalton, *Asbestos, Killer Dust* (1979), p 98.

<sup>55</sup> Interviewee A9

<sup>56</sup> Interviewee A4.

<sup>57</sup> Interviewee A9

<sup>58</sup> Interviewee A12.

<sup>59</sup> Interviewee A2.

<sup>60</sup> Interviewee A14

<sup>61</sup> Interviewee A18

<sup>62</sup> Interviewee A3.

<sup>63</sup> Interviewee A18

<sup>64</sup> Interviewee A7.



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<sup>65</sup> Interviewee A14

<sup>66</sup> Letter A.W. Garnett, Chief Inspector of Factories, to J.W. Roberts (asbestos manufacturers), Leeds, August 1945 (Turner and Newall Archive)

<sup>67</sup> SIEA, *Minutes*, 28 Mar 1951; 11 April 1951; 14 June 1957; A.J.P. Dalton, *Asbestos, Killer Dust* (1979), pp. 98-9, citing the testimony of John Todd, Glasgow TGWU local activist.

<sup>68</sup> STUC, *87<sup>th</sup> Annual Report*, 1984, p. 659.

<sup>69</sup> Dalton, *ibid.*, pp. 99-100. One lagger commented in 1978 that the joint committee had not met for 4 years.

<sup>70</sup> In 1955, the TGWU claimed to represent 90% of all workers in thermal insulation in Scotland. See SIEA, *Minutes*, 1 Dec. 1955

<sup>71</sup> Interviewee A10.

<sup>72</sup> Interviewee A16.

<sup>73</sup> The employment history of one Clydeside lagger, John Todd, indicates engagement with 23 separate insulating companies and one shipyard (UCBS) between 1954 and 1975 on 53 separate contracts. Todd Papers (Clyde Action on Asbestos).

<sup>74</sup> Interviewee A6

<sup>75</sup> Interviewee A18.

<sup>76</sup> Interviewee A15.

<sup>77</sup> This is discussed in more detail in R. Johnston and A. McIvor, 'Pushed into social exclusion', *Scottish Affairs*, forthcoming, 2000.

<sup>78</sup> See R. Johnston and A. McIvor, 'Whatever happened to the Occupational Health Service', in Nottingham, ed., *Fifty Years of the NHS in Scotland* (forthcoming, 2000).