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Case No: 2286/04

RECORD OF INVESTIGATION INTO DEATH

Introduction - home renovation related asbestos exposure

During the 1970's and early 1980's Mr. Christian Armand worked in Victoria as a self employed carpenter and builder renovating houses and working internally in bathrooms or on external cladding with asbestos cement sheet. It appears that this is where Armand had significant exposure to asbestos dust (by way of working with asbestos cement sheet, etc.), which eventually led to his contracting mesothelioma and subsequent premature death, aged 56, on 1st July 2004.

Mr. Armand's death is but one of a number of deaths associated with asbestos exposure that have recently been investigated by the State Coroner's Office. Since January 2004 asbestos exposure caused deaths have been required to be reported to the Victorian Coroner as they have occurred from an "*accident or injury*" or are from "*unnatural*" causes.[1] Armand's death and the extent of asbestos related products lying dormant in Australian homes, which were built before the mid 1980s, highlights the hazards associated with home renovation for the increasing number of do-it-yourself renovators. Contract builders and allied trades working on maintaining and in renovating homes also need to be considered. Hence this Finding (along with the Recommendations and Comments) is designed to help raise an important current and future issue for the health and safety of the general public as well as some sectors of the building industry. It is indeed troubling that in the recent much publicised Inquiry in New South Wales, the *"Special Commission of Inquiry into the Medical Research and Compensation Foundation",* Commissioner Daryl Jackson notes:

> *" The exposure to asbestos may not even yet have occurred... "*

As a cure to asbestos related cancers has not yet been found, preventing the exposure that may result in long-term development of the disease is vital.[2]

As asbestos products in Australian homes do not have attached warning labels, it may be difficult for many renovating home owners to identify, let alone understand the full nature of the risks and how to manage those risks, there is a need for significant and ongoing preventative activity by

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[1] The Victorian Coroners Act 1985 (Section 3) requires deaths occuring directly or indirectly from "*accident or injury"* or appears to have been "*unnatural*" to be reported to the Coroner. In the case of asbestos the term "*accident or injury*" relates to the initial exposure to the fibres which are lodged in the lungs and eventually over a considerable time leads to the fatal disease. "*Unnatural*" relates to the man-made nature of the product creating the hazard.

[2] Although it is noted that work on a cure is being undertaken at the Charles Gairdner Hospital , Perth, Western Australia.

governments, industry, research and community groups and the former manufacturers of this potentially dangerous (if disturbed or degraded) product.[3]

The investigation of the death of Mr. Armand was completed by a finding on the documented material collected by police and a forensic pathologist on behalf of the Coroner (called a *"Chambers Finding"*). This material identified the James Hardie Group of Companies, the major manufacturer of asbestos building materials in Australia, as an interested party.

To date, the investigations of all of the reported cases relating to asbestos have been completed by way of chambers finding rather than the public inquest hearing method. In the case of Mr. Armand, on 5th October 2004, following completion of a *"Draft Finding"* by the Coroner a copy of the document was forwarded, in accordance with a legal procedure called the *Erebus Rules* [4], to the Solicitors for the family of Mr. Armand and the Chair of the Board of Directors of the James Hardie Group for input and comment.

Submissions were received from both parties and considered in finalising the Findings, Recommendations and Comments.[5] Also following a request from the Coroner some limited documentary information supporting its submission was received from James Hardie.[6] James Hardie did not supply the balance of the information requested as it was said to be in the control of another company, namely Amaca Pty. Ltd.

In relation to the recommendations on public health and safety (particularly Recommendations 1 and 2 in the Draft Finding), the solicitor for James Hardie noted in her letter of submission:

> *"Let me begin by saying that James Hardie is prepared to consider supporting initiative like those described in Recommendation 1 and Recommendation 2 of your draft report. We believe asbestos awareness programs such as those recommended have an important role to play in informing people about the potential dangers of asbestos. However we would like to consider the most effective way of implementing such programs. It is our hope that other former asbestos manufacturers, members of the construction industry and State and Federal governments will support these initiatives too."*

In spite of some of the caveats in James Hardies' general letter of submission to the Coroner, provided structured preventative action occurs promptly and the James Hardie Group, as the major manufacturer of this hazardous building product [7] in Australia for many years, contributes in **a timely, significant and long-term** way to programs aimed at the future health and safety of the community, one could not disagree with its initial position as indicated above. However, whilst delays in development and implementation of programs occur, Commissioner Jackson's warning is apposite and individuals will, unknowingly and unnecessarily, be exposed. Time is of the essence in this regard. Thus, by choosing to commit resources and playing a positive role in moving the

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[3] Consideration needs to be given to product life in the domestic situation. See for example discussion in the *"Asbestos - An Inquiry: Usage in Victoria, Substitutes and Alternatives,"* October 1990, Victorian Occupational Health and Safety Commission, p.34 and at p.57 where there is some discussion about the fact that *"most AC sheet roofs will be approaching the end of their useful life and will have to be replaced regardless of government policy on asbestos.."*

[4] The *Erebus Rules* include a provision that if any person represented at an inquiry is at risk of adverse finding they should not be deprived of an ability to adduce additional material (see ***Mahon v Air New Zealand*** [1984] UKPC 808).

[5] See **Appendix *"D"*** to the Armand Finding.

[6] See **Appendix *"D"***. The details of the request are contained in a letter from the State Coroner to James Hardie which is dated 5th November 2004. The limited information in response to that letter is contained in the Facsmilie from James Hardie, dated 17th November 2004. It was not considered appropriate to delay completion of this investigation any further by seeking from Amaca Pty. Ltd., the remaining information for this case.

[7] Note: There are other asbestos products that were produced by James Hardie like those used in the motor vehicle industry - issues associated with this range of products has not been considered.

debate forward, the James Hardie Group (its successors or assigns) potentially has a very important part to play in the future health and safety of the Australian public in the immediate, medium and longer term.

Obviously, for an effective prevention program governments, other former asbestos manufacturers, sectors of the building and construction industry, health, safety and research agencies and the community will also need to be involved now, and for many years in the future. A ***whole of government*** approach will need to be taken, key government agencies will be required to develop prevention programs and a lead agency will need to be selected for longer term management and audit purposes.

Throughout this completed Finding, Recommendations and Comments reference will be made to the original draft document. If comparisons are required (of the finding before and after submissions) it can be obtained from the State Coroner's Office.

FINDINGS

The death of CHRISTIAN ARMAND occurred on 1st July, 2004 at the Bethlehem Hospital, Victoria from 1(a) Malignant Pleural Mesothelioma.

Summary of circumstances

Mr. Armand, aged 56, was born in Lyon, France and emigrated to Australia in January 1970. When he first arrived in Australia he worked in the construction industry. By about the mid 1970s he had commenced working for himself as a carpenter and builder renovating houses and working internally in bathrooms or on external cladding with asbestos cement sheet. It appears that this is where Armand had significant exposure to asbestos (by way of asbestos cement sheet, etc.), which probably eventually led to his contracting mesothelioma and death.

Detail of Mr. Armand's work history and exposure to asbestos

According to Mr. Michael Kottek, an Occupational and Environmental Health Consultant (in a report dated 22nd January 2004 addressed to Armand's Solicitors), Armand's Occupational History (and likely exposure to asbestos)[8] was as follows:

> *"On leaving school Mr Armand commenced work with a large company that was constructing high-rise buildings; he was to remain in his position for around 18-24 months. His work was restricted to marking out steel and the like for other tradesmen. He is unable to recall whether any asbestos containing materials were used on this building site. Based on Mr Armand's recollections, it is my opinion that it is possible that Mr Armand experienced some bystander exposure to asbestos while in this position. I am unaware how widely friable asbestos was used in high-rise construction in France. Further research into the extent to which asbestos was used in high-rise construction in France may provide some insight into how likely such exposure may have been.*
>
> *Mr. Armand then spent around 18 months national service in the Army. This work involved teaching in French Guyana. He does not recall any exposure to asbestos in this position. Based*

[8] Mr. Kottek interviewed Armand over the telephone for his report.

on Mr. Armand's recollections, in my opinion significant exposure to asbestos during his national service is unlikely.

On completing his national service in 1968, Mr Armand worked on the construction of underground shelters in Switzerland. He was engaged in this position for around one year. Mr Armand recalled that the shelters were constructed with concrete and steel, and he did not believe that asbestos was used in their construction. Based on Mr Armand's recollections, in my opinion significant bystander exposure is unlikely to have occurred in this position. This opinion is made after conducting only a brief amount of research on the internet into the extent to which asbestos may have been used in Swiss underground shelters. Additional research may provide further confidence in excluding this as a possible source of exposure."

On finishing work in Switzerland, Mr Armand had a short holiday before emigrating to Australia in January 1970. According to Kottek, his work history and exposure to asbestos in Australia was:

"He initially spent a short time (less than 2 months) cleaning at the Smorgon Meat Works in Brooklyn. He then spent around 3 years working for Sabar Constructions. He recalls working on a high rise building on St Kilda Road opposite the Shrine and on a shopping centre in Dandenong which I believe would be the Hub Arcade. It is possible that sprayed asbestos was used at these construction sites. However, these sites do not appear on Dr Kilpatrick's register of buildings with sprayed asbestos. Furthermore, Mr Armand does not recall asbestos spraying when working for Sabar Constructions, although his recollection of work in this period is not strong. On the available information I believe it is reasonable to assume that sprayed asbestos was not used on these sites.

Mr Armand recalled leaving Sabar during a three month strike in the construction industry. He then commenced work as a subcontractor carrying out framing work in the Springvale area. For some time after 1976, he also carried out external cladding work using asbestos cement sheeting, as wall as the framing work. For the last 25 years, Mr Armand's work has mainly been house renovations, including many bathroom renovations.

Since beginning to work for himself Mr Armand used asbestos cement sheet regularly, the main use being as a wall and floor lining in wet areas, and in his earlier years as an external wall lining. He recalled that the main tools he used for cutting the asbestos cement sheet were fibro cutters and a grinder, and he recalled using the grinder indoors on at least some occasions. He also recalled using 1 cm thick compressed asbestos sheet as flooring in wet areas and that this had to be cut using power tools. Mr Armand's work also required occasional demolition of in place cement sheet, including corrugated asbestos cement roofing, Until the 1980s Mr Armand did not take any precautions when using or removing asbestos cement products. Sometime in the 1980s he became aware of the hazards of asbestos from information supplied by the Master Builders Association."

On the *"significance of exposure"* Mr. Kottek opines that:

"Mr Armand has been exposed to asbestos to such a degree that it is far more likely than not that his exposure to asbestos is the cause of his mesothelioma. This opinion is based on the AWARD criteria, where the absence of a threshold exposure free from the risk of mesothelioma, means intermittent and low dose exposure to asbestos are appropriate for the attribution of mesothelioma to asbestos exposure.

It is not possible to attempt to quantify Mr Armand's cumulative exposure to asbestos. In my opinion it is clear that he would frequently have been exposed to at low levels of airborne asbestos fibres during the course of his work with asbestos cement sheet, and occasionally he

would have experienced intense exposure when using a grinder indoors. This opinion is based on Mr Armand's description of his work history, my review of the available literature and my own experiments carried out in a small test that was generally ventilated at between 15-50 air changes an hour ."

Significantly, Mr. Kottek commented that, *"throughout the period of Mr Armand's exposure to asbestos in Australia"* there were reports in:

"... the medical, industrial hygiene and other literature that indicated that the uncontrolled disturbance or handling of asbestos containing materials could generate airborne asbestos fibres, and that this carried with it the risk of serious lung diseases including mesothelioma.

I base this opinion on an extensive review of the literature where I am aware of more than 740 articles referring to the hazards of asbestos published before 1970. By 1980 I have records for more than 2,500 articles. These articles indicate that throughout the period of exposure, it was recognised that occupational exposure to asbestos carried the risk of serious lung disease including mesothelioma. Virtually all of these articles were available in Australia during the period of Mr Armand's exposure, and I am confident that all the items referred to below were available in Australia during the period of his exposure."

On an historical note, according to Mr. Kottek:

"In 1900, the 1898 Annual Report of the British Chief Inspector of Factories and Workshops was published. This contained an observation by the lady inspectors that,

'The evil effects of asbestos dust have also attracted my attention, a microscopic examination of this mineral dust which was made by HM Medical Inspector clearly revealed the sharp glass-like jagged nature of the particles, and where they are allowed to rise and remain suspended in the air of a room, in any quantity, the effects have been found to be injurious, as might have been expected.'

This is probably the first modern reference in English to the hazards posed by the use of asbestos in industrial society. Nevertheless, by the time of Mr Armand's exposure, this observation would have been regarded as little more than an historical anecdote in the development of knowledge regarding asbestos hazards."

That knowledge has been extensive.[9]

And that, in Mr. Armand's case, Kottek was of the view his exposure to asbestos had been:

"... a significant contributing factor to his contracting mesothelioma. Throughout the period in which he was exposed it was recognised that the use of asbestos caused some risk of mesothelioma. Mr Armand's exposure (and risk of contracting mesothelioma) could have been significantly reduced had any of the following control measures been implemented:

1. *Provision of information to users of asbestos cement regarding the hazards of asbestos and practical means of controlling exposure;*

2. *The use of hand tools or dust exhausted power tools to minimise exposure to dust generated by cutting asbestos containing materials;*

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[9] See also discussion under the heading *"Recommendations and Comments"* in this Finding and Commissioner D.F. Jackson's Report, Annexure J, pp. 115-123 (see **Appendix *"A"*** to the Armand Findings).

3. *Taking measurements of airborne asbestos dust to ensure compliance with recognised occupational exposure standards."*

This did not happen until it was too late.[10]

The roles of the James Hardie Group of companies and other asbestos manufacturers

The involvement of the James Hardie Group of companies in the manufacturing and marketing of asbestos products (and for building) in Australia was extensive. The recent report of Commissioner D.F. Jackson Q.C. in New South Wales *"Special Commission of Inquiry into the Medical Research and Compensation Foundation"* (September 2004) states:

> *"Companies in the James Hardie Group were major participants in the manufacturer and distribution of asbestos products. For a time the Group also mined asbestos ore. There have been many changes in the identity and names of the James Hardie companies but three companies are principally involved.*
>
> *The first is James Hardie Industries Ltd., now ABN 60 Pty. Limited. I describe it either as "JHIL" or as "ABN 60."*
>
> *At first JHIL was an importer of asbestos products, but it became a manufacturer in the 1920s. It continued as such until 1937 when manufacturing was carried on instead by the second principal company, its new subsidiary James Hardie & Coy Pty Ltd ("Coy"). Coy was a very substantial producer. It had plants in New South Wales, Victoria, Queensland, South Australia and Western Australia. In the 1980s, however, it ceased manufacturing asbestos products, the last production being at Welshpool in Western Australia and Meeandah in Queensland in March 1987."* [11]

Commissioner Jackson describes an extensive production activity by the James Hardie Group in *"Annexure J"* to his report. [12] In her submission to the Coroner the Solicitor for James Hardie Australasia Pty Ltd noted the company's main concern is that:

> *"The conclusions and recommendations in the draft report focus singularly on James Hardie, to the exclusion of other former asbestos manufacturers and others involved in the construction industry. This, in our view, is unreasonable given that James Hardie was one of a number of asbestos manufacturers in Australia. We have enclosed with this letter a graph which appeared in evidence before the recent Special Commission of Inquiry into the Medical Research & Compensation Foundation in New South Wales. As you will see from the graph, James Hardie was not the only manufacturer of asbestos cement products. In particular, other manufacturers' products accounted for approximately 25% of products sold in Australia."*

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[10] See **Appendix *"D"*** to the Armand Findings, letter from James Hardie, 3rd November 2004 about *"warnings"* and discussion under the heading *"Recommendations and Comments"* to the Finding.

[11] D.F. Jackson, Q.C. ***"Report of the Special Commission of Inquiry into the Medical Research and Compensation Foundation,"*** September 2004, at pp.17-18. See also **Appendix *"D"*** to the Armand Finding and the James Hardie letter dated 3rd November 2004 where the writer (Ms. Joanne Marchione) notes: *"Page 4 of your draft report quotes ... refers to James Hardie ceasing production of asbestos products in March 1987. That date relates to James Hardie ceasing to produce asbestos cement pipes. James Hardie's production of flat sheet asbestos cement, which appears to be the product to which Mr Armand was most likely to have been exposed, ceased several years earlier. In particular, James Hardie ceased production of flat sheet asbestos cement at its Brooklyn and Sunshine plants in Victoria in 1981 and had ceased all production of flat sheet asbestos cement in Australia by the end of 1983."*

[12] D.F. Jackson Q.C., Report, Annexure J - *Asbestos and James Hardie*, pp.115-126 and especially at pp.121-123 (**Appendix *"A"*** to the Armand Finding). See especially the *"Berry Admissions"* referred to in Annexure J of Commissioner Jackson's Report.

And while:

> *"you have concluded ... that it is likely that James Hardie products were involved in Mr Armand's exposure to asbestos, given the length of time over which Mr Armand worked with asbestos products and the nature of his work, it is highly unlikely that products of other asbestos manufacturers were not also involved."* [13]

The Facsimile from James Hardie (dated 17th November 2004) sets out a list of other asbestos cement sheet manufacturers. The brief email submission from Mr. Armand's solicitors (Slater and Gordon) also dated the same day, to a certain extent, contests James Hardies' assertions about the existence of other manufacturers. [14] Ultimately, whilst there are two conflicting views about the identity and number of other manufacturers of asbestos cement sheet at the relevant time, because of the conclusion reached it is not necessary to finally resolve this issue. In the longer term, because of the Recommendations and Comments in this Finding, it may be necessary for the appropriate government authority to reach a more concluded view (after investigation).

It is noted that the *"Draft Finding - Conclusion"* (available for inspection in the Armand File) did not refer to products from other former manufacturers.[15]

Conclusion

It appears likely that Mr. Armand was exposed to asbestos and acquired mesothelioma whilst working renovating houses in the 1970s. Kottek states by way of conclusion:

> *"Based on Mr. Armand's history, it is my opinion there is nothing to suggest that non-occupational asbestos exposure has significantly contributed to his contracting mesothelioma."*

In view of the extent of the involvement of the James Hardie Group of companies in the manufacture and distribution of asbestos cement sheet related products for consumption in the home building and renovation markets in Victoria, it is likely that the company's products were involved. The Hardie Group submission points out that involvement of products of other former asbestos manufacturers should not be excluded. Conversely, it is also not possible to state that these other manufacturers' products were involved. With the exception of James Hardie, it is not possible to determine, to the appropriate standard, which particular manufacturer's products were involved or when, let alone the fact of actual involvement. Thus one is left with the main producer of asbestos cement sheet products for the building industry, namely the James Hardie group (its successors or assigns), as being far more likely to have been involved in producing the material that ultimately resulted in Mr. Armand's death.

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[13] See **Appendix *"D"*** - Letter dated 3rd November 2004 from Ms. Joanne Marchione, Legal Counsel Australasia, James Hardie Australia Pty. Ltd. It is also noted that the Report ***"Asbestos - An Inquiry: Usage in Victoria, Substitutes and Alternatives,"*** October 1990, Victorian Occupational Health and Safety Commission, generally discusses sources of asbestos products in Chapter 3.

[14] See letter and email in **Appendix *"D"*** Commissioner Jackosn's Report (Annexure J at p. 122) suggests that James Hardie took over Wunderlich in 1960. Slater and Gordon's email suggests it was in 1977.

[15] Although in the *"Draft Recommendations and Comments"* reference was made to other other asbestos product manufacturers.

RECOMMENDATIONS AND COMMENTS

Introduction - asbestos and the do-it-yourself home renovator

As Mr. Armand's exposure to asbestos related to his work renovating homes and, in particular bathrooms, his death raises the issue of home renovation and asbestos exposure. Generally, asbestos building products in an undisturbed and stable state are relatively safe, but once disturbed without strict controls, potential health problems arise. This Court could not help but become aware, through the extensive amount of television marketing and other programs aimed at home renovation and the do-it-yourself market, and through some of the cases recently under Coroner's investigation (and other public information), about the potential for home renovation acquired exposure. In at least three of the cases under recent investigation, home-related exposure during renovation was an issue.[16] In one of these cases, Mr **John Krigsman** (Coroner's Case No: 2632/04) the deceased was exposed to asbestos dust while buiding a fence at his home in the late 1960s. This is an example of a single, limited, short-term exposure. Hence, the need to formally comment on this significant emerging public safety and health issue. It is important to note that the extensive use of asbestos products in other circumstances such as commercial building construction or the automotive and machinery industries has not been canvassed in this finding.

The recent report and media surrounding the New South Wales *"Special Commission of Inquiry into the Medical Research and Compensation Foundation"* has also highlighted the tragic individual, social and long-term economic cost of the use of asbestos in our community.[17] Clearly, there was long-term knowledge within this industry of the risk of asbestos exposure and its consequences and the James Hardie Group (in its many guises) was one of the main manufacturers/suppliers of this product.[18] There were others.[19] Commissioner Jackson notes:

> *"Australia was a very heavy consumer of asbestos products and their production appears to have reached its peak in the 1970s. The propensity of asbestos to cause diseases had been well known for years, however, and there was a search to develop satisfactory products which could be substitutes. "* [20]

And, in a related footnote:

> *"Asbestos was common in the 1920s and 1930s. The connection between asbestos exposure and mesothelioma was established in 1960; see the briefing paper "James Hardie and Asbestos" prepared by Wayne Attrill, JHIL's Litigation Counsel, for the meeting of proposed directors of the Foundation on 15 January 2001."* [21]

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[16] See **Donald Rawson** (Coroner's Case No. 1598/03 [**Appendix *"B"*** to the Armand Finding] especially pages 24-28). Also see general comments about asbestos and the Coroner's jurisdiction in Alban Attwood (Coroner's Case No: 2153/99 - an attachment to Rawson). See also **Douglas Hucket** (Coroner's Case No. 2616/04) has an issue of work as well as home renovation acquired exposure. There is another case (**Robert Miller** [Coroner's Case No. 3301/04]) where the exposure occurred when the deceased was building dog kennels for greyhounds using asbestos cement sheeting. He built the kennels over a 2-3 year period some 35 years ago. Mr. **John Krigsman** (Coroner's Case No: 2632/04) was exposed to asbestos dust while buiding a fence at his home in the late 1960s or early 1970s. D.F. Jackson notes (Annexure J, p.118) that exposure usually *"occurred at work, though cases of domestic exposure (a wife washing her husband's work clothes for example) are not uncommon."* Also see cases referred to in Footnote 14 of this Finding. ***"Asbestos - An Inquiry: Usage in Victoria, Substitutes and Alternatives,"*** October 1990, Victorian Occupational Health and Safety Commission, also referenced as part of this investigation. This 1990 OHSC Report contains a useful list of asbestos products and uses (see Appendicies 4 and 7 of the Report. Appendix 7 sets out under seperate headings the *"Major Uses"* and *"Minor Uses"*).

[17] D.F.Jackson, Q.C. Commissioner, September 2004

[18] D.F. Jackson, Q.C. Report at pp. 17-18 and Annexure J (which contains a detailed history).

[19] See **Appendix *"D"*** to the Armand Finding and the James Hardie letter dated 3rd November 2004. See attached *"Distribution of Consumption of Asbestos Products in Australia"* table

[20] D.F. Jackson, Q.C. p.18

[21] D.F. Jackson, Q.C. p. 18 Footnote 4 (JHIL is James Hardie Industries Ltd.).

Also in Annexure J to the Report, Commissioner Jackson notes:

> *"The asbestos dust levels generated in asbestos cement manufacturing factories was generally lower in comparison with other manufacturing processes involving asbestos. Progressive introduction of control measures from the late-1950s helped reduce dust levels in factories. A medical surveillance scheme for James Hardie workers was established in the 1960s and a full-time doctor was employed from 1967 to advise on all aspects of asbestos health related issues ... However flat and corrugated asbestos cement sheets and asbestos cement pipes were cut, drilled or processed on site and these processes could release asbestos fibres and dust which were then inhaled by workers or bystanders. From 1978 Coy's asbestos cement products carried warning labels. Prior to this Coy provided use instructions which recommended that users take steps to keep dust down (such as wetting the product while cutting it)."* [22]

Significantly, in 1967 the James Hardie Group hired a full-time doctor to advise its workers of the asbestos-related health issues. Thus the company knew of and responded to the risks to its own people but did not provide that timely, very necessary warning and advice to its customers and users in the building industry or to the general community. The James Hardie submission to the Coroner notes its products:

> *"... carried warnings from 1978 onwards. The warnings differed from time to time and from product to product, but were generally along the following lines:*
>
> > *CAUTION: This product contains asbestos. Breathing asbestos dust can damage health. Keep dust down. This product contains a small amount of asbestos bound firmly to it by cement and other materials. Asbestos dust can damage health. Keep dust down by following these simple rules:*
> >
> > *When sawing, drilling, etc. work in a well ventilated place, preferably outdoors.*
> >
> > *Use hand tools designed for cutting asbestos cement sheets such as fibro cutters or a score and snap knife or use an old handsaw. If cutting by power saw, use one which has a dust suppression attachment.*
> >
> > *Avoid drilling overhead where possible by pre-drilling before fixing.*
> >
> > *Damp down waste and dispose of it in a sealed bag."*[23]

And that:

> *"Prior to that, handling instructions had been included in the brochures accompanying all James Hardie's asbestos cement building products from June 1976. Those instructions were along the following lines:*
>
> > *All Hardie's asbestos cement building products may be readily cut on-site. The methods are "score-and-snap", hand guillotine, power and hand sawing. The process should always be carried out in open air situations or in well ventilated areas."*

For a long known risk of death from asbestos related cancers the 1978 *"warning"* is clearly inadequate. The 1976 *"Handling Instructions"* are vague and non-specific.

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[22] D.F.Jackson Q.C., Annexure J, pp. 118-119. James Hardie's involvement is more particularly described in Annexure J, paragraph F, pp. 121-123. See also *"The Berry Admissions"* and the decision in ***State Rail Authority (NSW) v Wallaby Grip Ltd*** (1999) 18 NSWCCR 193 (cited in D.F. Jackson Q.C., Annexure J - in **Appendix *"A"*** to the Armand Finding).

[23] See **Appendix *"D"*** to the Armand Finding and the James Hardie letter dated 3rd November 2004.

The Commissioner also says (in his remarks about the James Hardie Group):

> *"The negligence of the James Hardie companies occurred in the past, but the liabilities flowing from that negligence only arise day by day, now and in the future, as the diseases are acquired or manifest themselves.* ***The exposure to asbestos may not even yet have occurred.*** *The position in February 2001 was, as it remains, that members of the public will contract asbestos-related diseases over many years because of the negligence of Amaca and Amaba."*[24] (emphasis and underlining by Coroner)

There is a debate about the extent of exposure necessary for disease acquisition.[25] Obviously, the shorter the duration and intensity of exposure the lesser the risk. However, sensible management of this risk would indicate that it is necessary to put controls into place to significantly minimise or, preferably completely eliminate the exposure risk. The case of Mr. **John Krigsman** tends to demonstrate that short term exposure is a risk.

It should also be clearly noted, that although the James Hardie Group of Companies was one of the principal manufacturers and distributors of asbestos products for the Australian building industry in more recent times, historically there were others. At least one of those companies, CSR Limited, is still operating, although for a long time it has not manufactured or distributed asbestos products.[26]

Asbestos products have been extensively used in Australian homes up to the early 1980s and hence will continue to present a potential health problem when it is disturbed for the foreseeable future without appropriate controls for safe handling and disposal. Most of these products **do not** have any **attached** warning label.[27] Commissioner Jackson says:

> *"Asbestos was used in Australia during a large part of the last century in the manufacture of building products (particularly sheeting and roofing), pipes, insulation materials, brake linings and other friction products and other materials. Its fibres can give rise to lung cancer, asbestos-related pleural diseases and mesothelioma. Asbestos related diseases may take many years after exposure to manifest themselves. Mesothelioma is especially insidious: very slight exposure to asbestos may cause it, the disease may not manifest itself until 40 years or more after the exposure but when it does the course of the disease is most often short, very painful and fatal."* [28]

As indicated earlier, since commencing to systematically investigate the issue of asbestos acquired disease[29], this Court has become aware of an emerging, but previously relatively unaddressed asbestos problem related to home renovation.

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[24] D.F. Jackson Q.C., p.13. *Amaca* and *Amaba* are two former entities in the James Hardie Group of companies and are now controlled by the *Medical Research and Compensation Foundation* (which was set up by the James Hardie Group in 2001 (Jackson, p.7). Jackson also describes the various asbestos related diseases and the types of exposures in Annexure J, paragraph E, pp. 119-121. The diseases are Mesothelioma, Asbestosis, Lung Cancer, Asbestos-related Pleural disease. By way of example, on Mesothelioma, he notes that *" those exposed at younger ages are at a higher lifetime risk, however, mesothelioma is associated with a wide range of exposure duration and pulmonary asbestos burdens, including* ***sometimes seemingly small exposures****"* (emphasis added by Coroner). Occupational and environmental exposure is also discussed.

[25] See **Appendix *"D"*** to the Armand Finding and the James Hardie Facsimile (17th November 2004) where the solicitor refers to ***Rentz v Seltsam*** NSWDDT 15 2004 (this decision is included as an attachment to **Appendix *"D"***). In ***Rentz*** there is a discussion about the amount and nature of exposure neccessary for disease acquisition.

[26] D.F. Jackson Q.C. , Report, Annexure J at p. 118 and 122. See also **Appendix *"D"*** to the Armand Finding and the James Hardie letter dated 3rd November 2004, and *"Distribution"* table.

[27] In Western Australia some homes and out-buildings have warning stickers attached.

[28] D.F. Jackson Q.C., p.17

[29] From January 2004 Asbestos related deaths were required to be reported to the Victorian Coroner (formalised by general letter in March 2004). Recent cases being investigated in Victoria include acquisition of mesothelioma by a laundry operator and a dog kennel builder. However, generally most of the current group of cases under investigation are related to work exposure in the area of building and construction. Acquisition from working with cars has not yet been detected.

Mr. Kottek, in his report on Armand, provided a lengthy history on the knowledge of the dangers of asbestos. In that history is the following telling story:

> *"In 1962 McNulty reported the first Australian case of mesothelioma associated with asbestos exposure ..."*

And:

> *"In 1965 Elmes et al considered that transient exposure to asbestos could be an important factory in causing mesothelioma and that the increasing use of asbestos was a cause for concern.*
>
> *In 1965, Newhouse and Thompson report a case of peritoneal mesothelioma in a woman whose husband was a railway carriage builder, lining compartments with asbestos sheeting, with work clothes washed by her at home.*
>
> *In 1966, Hourihane et al noted a woman with calcified pleural plaques who had been exposed to asbestos 25 years before when she had held asbestos sheets intermittently over a period of six weeks' while her husband sawed them to make rabbit hutches.*
>
> *In 1966 Elmes et al reported a case of asbestosis in a woman who had helped her husband build two asbestos bungalows in 1947/48, holding the sheets while her husband sawed them."*

Do-it-yourself renovators and their families may be unknowingly exposed to asbestos related products to the long-term detriment of their health. It is understood that the appropriate authorities in the Victorian Government are aware of the potential problem and are currently working on ways to address the issue. In New South Wales the issue of asbestos in the home has been raised during Commissioner Jackson's inquiry. Some Local Councils (in Sydney) are also looking at some form of asbestos clearance certificate when a residential building permit is issued.

As Commissioner Jackson has explained, asbestos was contained in a number of building products regularly used in Australian homes (asbestos cement sheet [*AC* sheet or also called *"fibro cement sheet"*, *"cement sheet"*], cement sheet flooring for bathrooms and wet areas, pipe insulation, cladding, lining and roofs for houses, sheds, fences, etc.) until the early 1980s. As many of these homes are now being renovated, there is a real risk that do-it-yourself renovators are working with these products with little or no understanding of the risks, let alone methods of removal (there may be individuals who have already been involved in home renovation who have received significant exposure). In addition, some of the asbestos products in domestic dwellings may have reached the end of their useful life, and of necessity, for both practical and safety reasons, require replacement.[30]

Currently, asbestos can be removed by licensed contractors under government regulation. However, if a *harm minimisation* approach is to be taken (rather than a strict regulatory approach to removal) as a method to reduce the exposure risk, do-it-yourself renovators need not only to be able to identify the product but also to understand how to remove and dispose of it safely themselves. Some renovators may decide not to use licensed asbestos removal contractors and to do it themselves. Hence the need to take a *harm minimisation* approach. No doubt, a regulatory approach may be necessary for industry, but where the problem of removal is likely to be widespread and applying to the broader community, assumptions that everyone will comply with the regulatory approach and use licensed contractors may not be realistic. Accordingly, different methods of approaching the removal problem may need to be considered as a broad community level to

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[30] On product life see discussion in ***"Asbestos - An Inquiry: Usage in Victoria, Substitutes and Alternatives,"*** October 1990, Victorian Occupational Health and Safety Commission, pp. 34 and 57.

reducing this health risk. A *harm minimisation* methodology may be an appropriate, and additional way, of managing the home renovation asbestos risk problem. In this area of injury prevention, the community needs ongoing support and assistance.

The Victorian Department of Human Services, in conjunction with WorkSafe, Local Councils, Environment Protection Authority and the Building Commission, have recently produced a booklet for the home renovation industry called *"Asbestos in the Home - Health and Safety in the Home,"* 2003.[31] Whilst this booklet is a useful first step (and takes a *harm minimisation* approach), there may be a need to re-examine distribution methods and extent of the community knowledge of the problem. Also there may be some potential difficulties (and a possible practical barrier) for the do-it-yourself renovator and this issue may need to be re-examined for the next edition of the booklet.[32] In this investigation the level of work of government agencies in other States and Territories has not been examined in detail. Although similar booklets are available in South Australia and distributed through home hardware stores like Bunnings and also in New South Wales the booklets are sent out to home owners via local councils during the building permit application process.[33] The Northern Territory is about to launch a *whole of government* website (www.asbestos.nt.gov.au). Tasmania has a website and Australian Capital Territory also has a booklet *"Asbestos and the Home Renovator"*. Apparently, New South Wales and South Australia worked collaboratively on some of the information in their booklets. Importantly, the New South Wales booklet says, under the heading **"What are the health risks for renovators?"**:

> *"Most people are exposed to very small amounts of asbestos as they go about their daily lives and do not develop asbestos-related health problems. Finding that your home or workplace is made from fibro products does not mean your health is at risk. Studies have shown that these products, if in sound condition and left undisturbed, are not a significant health risk. If the asbestos fibres remain firmly bound in cement, generally you do not need to remove the fibro or even coat it.*
>
> *Health problems can occur when people are unaware of the hazards of working with fibro and do not take appropriate precautions. The important point is to always work to avoid or minimise the release of dust or small particles from asbestos material. If you use commonsense and follow basic safety guidelines, working with fibro products should not be a problem".*

The issue of asbestos removal and the prevention of further deaths from this product is obviously important not only for government safety regulators but also for local councils and shires in country regions, especially were the area has a significant proportion of residential buildings and backyard sheds.[34] Many local councils are also involved with Safe Community Networks. Accordingly, local councils and Safe Community Networks, working together, have an important existing and future role in delivering prevention activities.

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[31] See **Appendix *"C"*** to the Armand Finding.

[32] For example:

(a) Disposal of the equipment (mop) used to wash down the area (to remove asbestos dust residue). Is this an appropriate recommendation? and

(b) Is there general public availability of the appropriate industrial vacuum cleaner (to remove asbestos dust residue)?

[33] *"Asbestos and the Home Renovator"* (South Australia, Workplace Services, Department of Administrative and Information Services) and *"Fibro & Asbestos - a Renovator and Homeowner's Guide"* (New South Wales, WorkCover - distributed through the Department of Environment and Conservation and all local councils). However, not all renovations require a permit and therefore this opportunity to provide information through the auspices of local councils (following an application for a buiding permit) is limited.

[34] The Department of Human Services booklet *"Asbestos in the home - health and safety in the home"* recognises this fact.

Suppliers of materials for home building and renovation work (timber yards, plumbing suppliers, farm produce suppliers, home hardware retailers like Bunnings, Home Hardware, Mitre 10, etc.) may need to be involved in the regular distribution of simple information sheets to customers highlighting how to recognise asbestos products, the risks, controls required and where to seek further information and help. Apparently, some of this work is already underway in South Australia with its Workplace Services' information booklet being distributed through Bunnings.

Recent television renovation programs like: *"Backyard Blitz", "Hot Property", "Renovation Rescue", "Auction Squad", "Better Homes and Gardens", "Gardening Australia", "Landline"*, provide another opportunity to model and deliver regular, useful safety messages to the do-it-yourself community on asbestos and its removal.[35] Where they are working in older homes, this also may be a safety issue for some of the contractors or program staff undertaking renovation work.

Although do-it-yourself home renovation is not necessarily age limited, the younger age groups are more likely to be involved in buying and renovating homes. After the initial purchase, they may not have significant spare cash and thus will enter the do-it-yourself market. Also they may not have grown up with asbestos-related products and therefore do not have a basic knowledge about how to identify the product (there are no warnings attached). How to safely manage asbestos to avoid exposure is the next step.

The manufacturer's role in prevention: a joint process with government, industry and the community

As already indicated, the James Hardie Group of companies was the main producer of asbestos sheet and related products for the building industry in Victoria and its products were used extensively in home building until the early 1980s. The Wunderlich Company (part of CSR) also produced asbestos related products for home building and that company was taken over by James Hardie in about 1960.[36] It is also noted that there were other manufacturers of asbestos building products in Australia.

Tragically, the risk of developing mesothelioma or other asbestos-related lung disease from asbestos products was well known by research agencies, some sectors of the medical profession, the construction industry, governments and the manufacturers of the product for many years before the product was banned and risk controls were put in place. The troubling and long history of the knowledge of the dangers of asbestos starkly illustrates how **not** to manage health and safety issues. In view of the long known health consequences, the commercial focus on a search for suitable practical alternatives to the asbestos product was not a satisfactory reason for delaying early banning of sale of asbestos products and implementation of controls on handling and removal. Had that occurred a lot earlier, when it needed to, many individuals would have been spared.

Clearly, as the long history of this product demonstrates, as well as the asbestos manufacturers like James Hardie, some Government regulatory agencies were also aware of the health and safety dangers before it was drawn to the attention of the unsuspecting individual consumer. Likewise some sectors within the building and construction industry would have become aware at an earlier time.

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[35] It is noted that at least one of these programs (ABC - *"Gardening Austrlralia" - broadcast on 8th October 2004)* has warned viewers about the dangers associated with working with asbestos in the home. The ABC's *"Catalyst"* program which was broadcast on 24th June 2004, also discussed the issue at some length.

[36] The submission to the Coroner from Slater and Gordon (the solicitors for Mr. Armand's family) suggests it was in 1977. James Hardie notes in its submission that CSR had another company manufacturing asbestos - Seltsam. (See **Appendix *"D"***)

James Hardie, in its submission to the Coroner says:

> *"While you have concluded ... that it is likely that James Hardie products were involved in Mr Armand's exposure to asbestos, given the length of time over which Mr Armand worked with asbestos products and the nature of his work, it is highly unlikely that products of other asbestos manufacturers were not also involved. We do not believe that there can be a logical basis for restricting your conclusion and draft Recommendations 1 and 2 to the James Hardie group of companies, as opposed to all companies which historically manufactured asbestos products sold in Australia. It seems possible that the recent publicity surrounding the Special Commission of Inquiry into the Medical Research & Compensation Foundation has focussed attention on James Hardie's role in asbestos manufacture in Australia, to the exclusion of all others. If James Hardie is to consider devoting resources towards a proposal along the lines outlined in your draft Recommendations, it would also be appropriate that other former asbestos manufacturers, and possibly members of the construction industry and State and Federal governments, can reasonably be expected to contribute to such a proposal as well."*

No doubt on one level James Hardie is right. Prevention work needs to be undertaken by Governments (who ultimately have the responsibility to work to protect the public), industry groups, various community agencies and the manufacturers of the deleterious and dangerous product. However, one must not forget that James Hardie was the major manufacturer of the product in this country and this bears, and continues to bear, a potential for a **significant role** in the prevention of future harm. To maximise the potential to reduce harm that would mean substantial and ongoing resourcing, commitment and dedication to the task. As James Hardie points out, other manufacturers may need to join with it. But if this does not occur the major product manufacturer is not excused.

The extent and long-term potential of the risks of disturbing asbestos which is now lying dormant in many established Australian homes (as distinct from the in the working environment) is such that any manufacturer and supplier of the product may need to be involved, in a significant way, in major and ongoing prevention activities (under the direction and control of appropriate governmental safety and regulatory agencies). The important and very practical issue of product life and degradation in the domestic building setting also needs to be considered as part of an overall strategy aimed at improving public safety.

As indicated local councils and Safe Community Networks have an important role to play. Obviously, in this regard, practical support by way of advice and help with disposal is required. The manufacturer could be involved in supporting regional positions of a *"Community Asbestos Safety Advisory and Support Officer"* who could serve in the area of general community advice and support through the local councils and Safe Community Networks. The officer could visit sites, give general advice and provide assistance where required. From a practical and resourcing perspective, the position may need to straddle a number of council areas. There would also need to be a central management and resource structure with a data collecting and audit role. In the event that more work is needed in the area of occupational health and safety (i.e.: for farmers, small businesses (building and related contractors), etc.) then WorkSafe would also need to be involved (see comments below under the heading in this Finding - ***'Work-related death - the need to avoid "exposure to asbestos" that "may not even yet have occurred" ')***

This Court has seen some examples of where community minded and safety conscious manufacturers have been involved in working with their customers and government to ensure that repeats of injury and death incidents associated with their products do not continue. This should occur in the case of the James Hardie Group (and/or its successors) as it has a duty to the

community.[37] Other former manufacturers may also need to consider their duty in this regard. This type of response needs to be ongoing - the community deserves nothing less. Commissioner Jackson's troubling prediction, but timely warning, needs to be addressed and avoided:

" The exposure to asbestos may not even yet have occurred ..."

As a cure to asbestos related cancers has not yet been found, preventing the exposure that may result in long-term development of the disease is vital.

Recommendation 1

That the James Hardie group of companies (and/or its successors) consider working with appropriate government safety agencies (Health, WorkCover, Local Government, Consumer Affairs, Primary Industry, Environment Protection, etc) in major, ongoing and long-term programs to ensure that all potential home renovators are regularly advised of how to identify asbestos related products and helped in managing the risk when working with these potentially dangerous products.

No doubt, the James Hardie Group (and/or its successors) would need to consider committing considerable and ongoing resources to this important community prevention activity. The Medical Research and Compensation Foundation (established by the James Hardie Group) may also need to be involved.

Other former manufacturers of asbestos products for building and construction may also need to consider contributing.

The management of any program (and, ultimately, its structure and direction) needs to be in the hands of an appropriately selected, lead government agency. Ideally any program project/s would be developed in cooperation with all players.

Other agencies that need to be considered as important players in this type of project would be:

- *Medical Colleges (i.e.: Royal College of Surgeons and College of General Practitioners);*
- *Anti-Cancer Council;*
- *Major employers in the construction, timber and allied industries;*
- *Principal Unions;*
- *Principal Asbestos Support Groups;*
- *Timber, plumbing, farm produce and hardware and garden suppliers like Home Hardware, Bunnings, Mitre 10, etc.;*
- *Community Safety Networks;*
- *Major Injury Research Groups and allied University Departments (i.e: Strategic Injury Prevention Partnership (SIPP), Monash University Accident Research Centre, the National Injury Surveillance Unit at Flinders University, the James Goldstone School of Engineering and Physical Systems, Rockhampton and VIOSH at Ballarat University);*
- *The Media.*

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[37] It is noted that the James Hardie Group through the *"Medical Research and Compensation Foundation"* has already funded some medical research, see generally D.F. Jackson Q.C. report, Annexure K.

Recommendation 2

That the James Hardie Group of companies (and/or its successors) and other former asbestos manufacturers consider supporting a position like "Community Asbestos Safety Advisory and Support Officer" in a general advice and support role for regional areas. Such a process would need to be managed by an appropriate government lead agency to ensure a standard of training for the position, continuity, broad information collection and audit.

In the event that the James Hardie Group, and/or other former asbestos manufacturers, do not join with government, industry groups and the community in major, ongoing prevention work, the activity still needs to occur. With this in mind the following recommendation is made.

Recommendation 3 (in the alternative)

The appropriate government agencies concerned about public health and safety (like: Health, WorkCover, Local Government, Consumer Affairs, Primary Industry, Environment) need to work co-operatively and continue countermeasures such as (but not limited to) public education and risk management in the area of home renovation acquired asbestos disease to ensure that public knowledge of how to identify and manage the product is widespread. No doubt, with the ongoing and continuing nature of home renovation within the community, this process too, will need to keep pace to avoid the potential longer-term community health consequences.

Work-related death - the need to avoid *"exposure to asbestos"* that *"may not even yet have occurred"*

Whilst this finding and the comments have extended to the issue of do-it yourself home renovation, the general knowledge, extent and quality of risk management in the working community may also need to be regularly revisited by governments. In this area too, Commissioner Jackson's telling prediction, the *" exposure to asbestos may not even yet have occurred "* needs to be constantly borne in mind. Some contractors working in the area of home renovation also may need further attention. The farming community (who may work with buildings that have been constructed with asbestos products) may also need information and advice.

To avoid unnecessary duplication, any program structured to apply to the home renovation and the do-it-yourself market could be also modified and developed to cover the work-related area (provided the distinction between the two areas is made clear, as different considerations may apply between community and workplace prevention activities). Likewise, the James Hardie Group (and/or its successors) would need to be involved at a significant level. Other former manufacturers of asbestos products intended for use within the home building and related construction industry may also need to be involved.

Recommendation 4

The appropriate government agency concerned with occupational health and safety, like WorkCover in Victoria, may also need to work with the manufacturers (James Hardie, et al) and the building and construction industry (peak employer groups and unions) on developing and delivering programs aimed at ensuring all those working in the building and allied trades are appropriately managing the asbestos hazard in the home renovation and related industries.

Although targeted prevention activity may be needed for industry, programs designed to assist in safe management of asbestos in the general area of building and construction, might usefully be run side-by-side with, and compliment some of the broader community based prevention programs.

A *"Whole of Government"* approach - the National implications

These recommendations (1-4 above) are structured, initially to apply to Victoria. However, as the product use was extensive and knows no State boundary, there is no reason why the same comments and recommendations should not apply **broadly to the Australian community**. Unless well managed, the asbestos product lying dormant in many homes, has potential to effect the long-term health of many Australians and create a significant, ongoing, additional economic and social burden.

Accordingly, a whole of government approach may be needed. If it is considered appropriate to apply a uniform approach across Australia agencies like the National Occupational Health and Safety Commission, each State and Territory's Justice, WorkCover, Consumer Affairs, Local Government and Environment Protection departments might consider taking the lead and select an appropriate management agency for the short and longer term. It is noted that a number of other States are already working separately on the problem.

At the appropriate level, the Federal Government may also need to be involved.

Distribution of the Finding

A copy of this finding will be forwarded to the:

- Attorney General, Victoria (and for distribution to the Standing Committee of Attorneys General),
- Minister for WorkCover, Victoria,
- Minister for Health, Victoria
- Minister for Consumer Affairs, Victoria,
- Minister for Local Government, Victoria,
- Minister for Environment, Victoria,
- State and Chief Coroners,
- Chief Commissioner of Victoria Police,
- Secretary, Department of Justice, New South Wales,
- Chairman, National Occupational Health and Safety Commission,
- Chief Executive Officer, WorkSafe,
- Director, Consumer Affairs Victoria,
- Chairman, Environment Protection Authority,
- Commissioner, Victorian Building Commission,
- Chair of the Board of Directors, James Hardie Industries,
- Managing Director, CSR Limited,
- Managing Director, Amaca Pty. Ltd.,
- Chair, Medical Research and Compensation Foundation,
- Chair, Committee of the Presidents of the Medical Colleges (for distribution to relevant colleges like the Royal College of Surgeons, College of General Practitioners, etc),
- Chairman, Anti-Cancer Council,
- Secretary, Australian Council of Trade Unions,
- Secretary, Australian Workers Union,

- Secretary, Gippsland Asbestos Related Diseases Support Inc. (for distribution to other peak asbestos support groups),
- Secretary, Construction, Forestry, Mining and Energy Union,
- Chief Executive, Victorian Congress of Employer Associations,
- Victorian Manager, Australian Institute of Company Directors,
- Chief Executive Officer, Master Builders Association,
- Chief Executive Officer, Seven Network Limited,
- Managing Director, Channel Nine,
- Chief Operations Officer, Network Ten,
- Chairman, Board of Directors, Australian Broadcasting Commission,
- Chair, Farmsafe Alliance,
- President (Victoria), Safety Institute of Australia,
- Chair, Strategic Injury Prevention Partnership (SIPP),
- Chief Executive Officer, Victorian Institute of Occupational Safety and Health (VIOSH, Ballarat University),
- President, Australian Safe Communities Foundation (for distribution to all Safe Community Networks),
- Dean, James Goldstone School of Engineering and Physical Systems, Central Queensland University, Rockhampton, Queensland,
- Director, National Injury Surveillance Unit, Flinders University, Adelaide, South Australia,
- Head, Department of Epidemiology and Preventative Medicine, Monash University, and
- The Director, Monash University Accident Research Centre.

Graeme Johnstone
State Coroner
18th November 2004

APPENDIX "A"

ANNEXURE J
Asbestos and James Hardie

Asbestos-Related Liabilities [1]

A. Asbestos Mineralogy

Asbestos is a family of crystalline hydrated silicates with a fibrous geometry and unique physical and chemical properties. Asbestos fibre is classified into two groups, serpentine and amphibole. Chrysotile (or white asbestos) is the only member of the serpentine group. Crocidolite (blue asbestos), amosite (brown asbestos), tremolite, anthophyllite and actinolite are amphiboles. The amphiboles are characterised by long rigid fibres. Chrysotile fibres are curly and tend to break into smaller fragments. The general medical view was that white asbestos was of a lesser toxicity than blue and brown asbestos, although that has been recently questioned in light of an increasing experience of claims associated with exposure to chrysotile in the United States.[2]

B. Industrial Use Of Asbestos

Asbestos has been used widely throughout history because of its strength, flexibility, durability and its resistance to heat, acids and alkalies. The majority of asbestos used in Australia was incorporated into asbestos cement, i.e. cement reinforced with asbestos fibres. There were two main categories of asbestos cement product, building materials and pressure and sewerage pipes. The building materials included corrugated sheeting, flat sheeting, roof tiles and moulded products such as gutters and telecom pits. High density asbestos cement was used for thermal and electrical insulation, such as in furnaces, bench tops, fume cupboard linings and switch gear. Asbestos cement poses fewer health risks than certain other types of asbestos-containing products because the asbestos fibres are firmly bound into a cement matrix.

The second largest category of asbestos use was as a filler or reinforcement. The main products within this category included asbestos-containing paper and millboard which were used in the manufacture of products such as roofing felts, clutch facings, brakes and gaskets. Asbestos fibres were added to paint to give various textured finishes, strength, heat resistance and opaqueness. Many plastic sheets and tile flooring products contained asbestos. Asbestos packings and seats were

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[1] Except where otherwise indicated, the material contained in this Annexure is in significant measure derived from a document prepared by Mr Attrill, then Litigation Manager for the James Hardie Group, which was provided to the incoming directors of the MRCF on 15 January 2001: Ex 2, Vol 3, pp. 456, 457. The note gives some content to the expression asbestos related liabilities and what is comprehended by that concept. Mr Attrill himself adapted the work of A.R. Johnson, An Analysis of the Cases of Malignant Mesothelioma Compensated by the Workers Compensation (Dust Diseases) Board of New South Wales, thesis for the degree of Master of Occupational Health and Safety, University of Sydney (1997), pp. 3–31. The Annexure has been prepared with reference to the expert evidence of Mr Whitehead (Ex 251) and Mr Wilkinson (Ex 256).

[2] Wilkinson T 3340.15-22, 28-39

used in a wide range of products, for example, gaskets. Asbestos reinforced plastics were incorporated in automotive components, small machine parts, road signs and bearings.

Asbestos is an excellent insulation material. Fire resistant insulation boards were similar to asbestos cement products but had a much higher asbestos content, 25% to 40% versus 10% to 15% by weight. They were widely used for partitions and suspended ceilings as a barrier to fire or to protect structural steelwork. Asbestos lagging for thermal insulation was made in the form of rigid pipes, slabs, pre-formed sections or sprayed coatings. Sprayed on asbestos insulation was easier to apply, particularly on uneven or hard to get at surfaces. Pipe and boiler lagging was commonly used in ships, engineering works, power stations, factories, hospitals and other large buildings. Woven asbestos was used to manufacture asbestos quilts, mattresses, and blankets for thermal insulation. These were often used on ships. Asbestos cloths were made into protective clothing and safety curtains. Asbestos cord or rope was used for thermal insulation on small domestic and industrial pipe work. Asbestos yarns and fabrics had a high asbestos content, up to 100%.

Currently world usage of asbestos is confined to chrysotile and to four principal product categories; asbestos cement, friction materials, roof coatings and cements, and gaskets. Approximately 85% of chrysotile used worldwide is for production of asbestos-cement products (pipes and sheets), mainly in developing countries. In 1992, approximately 28 million tonnes of asbestos-cement products were produced in about 100 countries. About 10,000 tonnes of chrysotile asbestos is imported in Australia annually for use in friction products. The use of asbestos is being progressively phased out across the world.

C. The Australian Asbestos Industry

Mining

For much of the 20th Century, with the exception of the early 1980s, most of the asbestos fibre used in Australia was imported. [3] Until the re-opening of the Woodsreef mine at Barraba in 1970, the only mine of note was the Wittenoom mine in Western Australia which produced blue asbestos from about 1937 until 1967. The Woodsreef mine produced white asbestos and approximately half of its production was exported. Asbestos mines were operating around 1918 in Tasmania and at Baryulgil in NSW. Small mines produced crocidolite in South Australia from as early as 1916 until the 1950s but never in large amounts. Australian Blue Asbestos Pty Limited (a subsidiary of CSR)

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[3] Whitehead Ex 251, para. 3.5.14, Figure 3.3: Volume of Asbestos Mined in Australia and Imported

started production at Wittenoom in the Pilbara region of Western Australia in 1938. The mine ceased production in 1966 as it was unprofitable. In 1997 to 1983, Woodsreef operated at Barraba, NSW, the largest chrysotile mine in Australia. Australia was never a large producer of asbestos fibre; in 1952 it produced only 0.2% of world production.

Asbestos Fibre Production and Use in Australia

The bulk of asbestos used in Australia during the 20th Century (perhaps over 90%) was used to produce asbestos cement. [4] Asbestos cement refers to cement that has been reinforced with asbestos fibres to produce a much stronger and more useful product. The presence of asbestos can also render the product harder and more fire resistant.

Prior to 1916 asbestos cement products were imported from England and Europe. In 1916 the Wunderlich company (later part of CSR) opened a factory in Cabarita, a Sydney suburb. Other factories (including those operated by James Hardie) soon followed. The peak period for the industry was following World War II when demand outstripped supply. For example, it became necessary to order pipe for large civil projects many years in advance and State Governments rationed supply.

Asbestos cement sheeting was liberally used in housing during this time. Between 1945 and 1954 more than 70,000 homes were built using asbestos cement cladding in NSW, 57% of the homes built in the State. In Australia as a whole 25% of new houses were built with asbestos cement. The bulk of asbestos fibre used was chrysotile from Canada. The addition of amphiboles helped speed up the rate of production and strengthen the product. Amosite was the major amphibole used and was imported from South Africa, some crocidolite from the Wittenoom mine (operated by a CSR subsidiary) in Western Australia was also used. Crocidolite's use was limited as it was more expensive and added a blue discolouration to the product.

Consumption

Australia has been one of the largest consumers of asbestos in the world. During the 1950s Australia was the fourth largest consumer of asbestos cement products and the highest per capita user of asbestos in the world (predominantly chrysotile). There was a rapid increase in the use of asbestos in Australia for the 30 years from 1940 to 1970, followed by a relatively stable volume during the 1970s. The decline in usage was even more rapid than the increase, with consumption

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[4] Whitehead Ex 251 para 3.5.19

dropping to relatively small amounts by 1985 and to very small amounts by the end of the 1980s.[5] The use of asbestos in Australia was effectively banned from the end of 2003. [6]

Because industrial and commercial use of asbestos was widespread in Australia to up to the 1980s, recipients of claims have included government bodies (e.g. the Royal Australia Navy, State Rail Authority, Land & Housing Commission, Pacific Power), manufacturers (e.g. JHIL, Coy and Jsekarb, CSR Limited through its subsidiary Seltsam), employers (e.g. major construction companies) and occupiers of sites where asbestos was used (e.g. power station operators).

D. Asbestos Exposure

Asbestos fibres can cause various diseases when inhaled. The risk of disease depends on the type of fibre the concentration of asbestos in the inhaled air and the period of time over which the person was exposed. Long thin fibres (typical of amphiboles like crocidolite) are generally more carcinogenic than shorter thicker ones (typical of chrysotile), possibly because amphibole fibres are not cleared as quickly from the lungs. Fibres less than 5 um in length are mostly removed by the lungs' own clearance mechanism. Fibres longer than 5 um are mostly deposited in the respiratory and terminal bronchioles and it is these fibres that may subsequently cause disease.

Occupational Asbestos Exposure

Exposed to asbestos fibres from products or manufacturing processes is said to occur in various ways.[7] Exposure usually occurred at work, although cases of domestic exposure (a wife washing her husband's work clothes, for example) are not uncommon. Claims have also been received from waterside workers who allege exposure to raw asbestos while unloading or handling bags of asbestos fibre which has been imported or shipped.

Raw asbestos is used in asbestos cement manufacture. The asbestos dust levels generated in asbestos cement manufacturing factories was generally lower in comparison with other manufacturing processes involving asbestos. Progressive introduction of control measures from the late-1950s helped reduce dust levels in factories. A medical surveillance scheme for James Hardie workers was established in the 1960s and a full-time doctor was employed from 1967 to advise on all aspects of asbestos health related issues.

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[5] Whitehead Ex 251 Figure 3.2: Annual Average Decadal Usage of Asbestos Fibre in Australia
[6] Whitehead Ex 251 para. 3.5.11
[7] Whitehead Ex 251 Figure 3.4: Relative Consumption of Asbestos by Industry; see also para. 3.5.50–51 (Categories of persons who might have been exposed to asbestos)

Most asbestos products destined for the construction industry did not undergo any further manufacturing operation between the factory and the construction site. However flat and corrugated asbestos cement sheets and asbestos cement pipes were cut, drilled or processed on site and these processes could release asbestos fibres and dust which were then inhaled by workers or bystanders. From 1978 Coy's asbestos cement products carried warning labels. Prior to this Coy provided use instructions which recommended that users take steps to keep dust down (such as wetting the product while cutting it).

Exposure to asbestos in friction products occurred in the manufacture and maintenance of those products, particularly amongst motor mechanics. However, the risk of contracting an asbestos-related disease from exposure to brake linings is not high due to the fact that friction products only contained chrysotile and because of the low and intermittent exposure to asbestos experienced by mechanics.

Environmental Asbestos Exposure

Due to the widespread use of asbestos in industrialised countries some exposure to asbestos is probably universal, particularly in urban areas. Asbestos fibres have been found in water supplies and food products. Asbestos fibres are commonly found in the lungs of city dwellers. Whether asbestos exposure in the general population at these low levels causes disease is contentious and, on present scientific evidence, is most unlikely. That is, exposure to a greater than background level of asbestos is necessary to develop disease.

E. Diseases Associated With Asbestos Exposure

There are four principal asbestos-related diseases:

(a) **Mesothelioma** – a disease in which cancer (malignant) cells are found in the sac lining the chest (the pleura) or abdomen (the peritoneum);

(b) **Asbestosis** – a progressive scarring of the lungs which is potentially fatal;

(c) **Lung Cancer** – which may in certain circumstances be caused by exposure to asbestos; and

(d) **Asbestos-related Pleural Disease** – a range of non-malignant conditions similar to asbestosis which are caused by inhalation of asbestos fibres. ARPD can range from asymptomatic pleural plaques to extensive pleural fibrosis causing severe breathlessness.

Malignant Mesothelioma. Malignant mesothelioma is the most serious asbestos-related disease. The typical life expectancy from diagnosis is six to nine months. It is a diffuse malignant tumour usually of the pleura or peritoneum. Although it can take 30 years or more to manifest itself from the person's first exposure to asbestos, once the tumour starts growing it is unusually aggressive.

The connection between asbestos exposure (crocidolite) and mesothelioma was first established by Wagner in South Africa in 1960. The relative risk for developing mesothelioma is dependant on fibre type, dose and time since first exposed. Thus, those exposed at younger ages are at higher lifetime risk. However, mesothelioma is associated with a wide range of exposure duration and pulmonary asbestos burdens, including sometimes seemingly small exposures.

Families of asbestos workers exposed to asbestos on hair and clothing have been found to be at risk, as are employees who worked in the same vicinity as asbestos workers. The risk of mesothelioma in workers exposed to chrysotile is much lower than the risk in workers exposed to amphiboles (especially crocidolite) or to mixtures of fibres containing amphiboles.

Asbestosis. Asbestosis refers to interstitial pulmonary fibrosis resulting from asbestos exposure. The more intense the dose, the earlier and ultimately more severe the fibrosis. During the 1920s and 1930s asbestosis was common and often took as little as seven to eight years to develop in a worker. Regulation of the industry and voluntary dust suppression measures lowered exposure levels and decreased the incidence of the disease. The diagnosis of asbestosis requires sufficient past exposure to asbestos to place the individual at substantial risk. Asbestosis is unlikely to occur unless there has been exposure to at least moderate concentrations of asbestos for more than a few years. Chrysotile can cause asbestosis, and again the disease may take 20 or more years from exposure to manifest.

Lung Cancer. Asbestos is a known carcinogen and the incidence of lung cancer is higher among asbestos workers. All lung cancer types occur in asbestos workers. An estimated 5.7% of all lung cancers in men in the West of Scotland (an area which had a large shipbuilding industry) are asbestos related. The latency from first exposure is in excess of 20 years.

The relative risk for developing lung cancer depends on a number of factors, dose, fibre type, job type, smoking history and presence of pulmonary fibrosis. The general view is that there is approximately a multiplicative effect of smoking and asbestos exposure. That is, although both asbestos and smoking in their own right increase the risk of lung cancer, asbestos and smoking together increase that risk many-fold. At present, the Courts require evidence of asbestosis, or of exposure to asbestosis sufficient to cause asbestosis, before attributing a lung cancer to asbestos exposure.

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Asbestos-related Pleural Disease – Pleural Plaques. Pleural plaques are the most common manifestation of asbestos exposure. Macroscopically, pleural plaques appear as shiny, white, slightly raised areas on the parietal thoracic wall and diaphragmatic pleura. Microscopically they consist of fibrous tissue. Asbestos fibres are rarely found in pleural plaques. Pleural plaques are probably not, *per s*e, associated with an increased risk of lung cancer or any other disease. Rather, they are a marker of asbestos exposure. They occur some 15 years after exposure, and are associated with the duration and amount of exposure. Generally pleural plaques are asymptomatic (and are therefore non-compensable), but occasionally a person with plaques will claim damages for pain or for the fear of contracting a more serious disease.

Asbestos-related Pleural Disease – Benign Pleural Effusions. Benign pleural effusions occur in a small percentage of asbestos workers, usually less than 20 years after initial exposure to high concentrations of asbestos.

Asbestos-related Pleural Disease – Diffuse Pleural Thickening. Diffuse pleural thickening can severely impair ventilation and cause significant restrictions on lung function. Restricted lung function with a preserved diffusing capacity is the expected pattern.

Asbestos-related Pleural Disease – Rounded Atelectasis. Rounded atelectasis refers to a peculiar infolding of the pleura. These lesions can occur many years after exposure to asbestos and are probably sequelae of benign pleural effusions. The peripheral infolding of the lung is the result of the associated pleural thickening and can be mistaken for a tumour. They have a characteristic appearance on computed tomography of a 'comet tail' of vessels and bronchi leading into the lesion and associated pleural thickening, maximal adjacent to the lesion. Once formed they tend to persist relatively unchanged.

F. James Hardie's Involvement with Asbestos

Coy's was the dominant consumer of asbestos in Australia, averaging approximately 70% (60,000 tonnes) of all asbestos fibre consumed annually.[8] Coy's primary business was the manufacture of asbestos cement products. These came in the form of building products and asbestos cement pipes. Prior to the mid-1980s, Coy manufactured asbestos cement flat and corrugated sheets for internal and external wall cladding in buildings and for roofs, asbestos cement water and sewer pipes. Building products were originally imported from Italy but by the 1920s local production started at

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[8] Whitehead Ex 251 para. 3.5.41, Figure 3.5 Relative Consumption of Asbestos by JHG vs Others; Wilkinson T 3391.26-30

the Camellia factory in NSW. Production started soon after at factories in Victoria (Brooklyn) and at Newstead in Queensland. At a later stage the Rivervale plant in Western Australia was built and a joint operation in association with Wunderlich was established in Adelaide in the 1950s. In 1960 Coy became the sole operator of the South Australian business when it bought out Wunderlich's interest. Prior to 1974 Coy also manufactured asbestos insulation materials in a joint venture with CSR Limited, and also in its own right prior to 1964.

White asbestos (chrysotile) was by far the most common type of asbestos used by Coy, which at the time was thought to pose less risk of inducing mesothelioma than did crocidolite. Recent medical thinking suggests the conclusions about toxicity may not be correct. Chrysotile was mainly sourced its supplies from Canadian mines in Quebec and British Columbia. A James Hardie subsidiary, Asbestos Mines Pty Limited, owned and operated the small chrysotile mine at Baryulgil until its sale in 1975. However the total output of the mine was very limited. The major fibre used in the manufacture of asbestos cement products was chrysotile Brown asbestos (amosite) was not used in Coy products until the 1950s when new sources of the fibre were opened up in South Africa. The use of small quantities of amosite in asbestos cement products continued until about 1980. Coy used blue asbestos (crocidolite) in certain products from the mid-1950s until about 1968. The crocidolite was sourced from the CSR mine at Wittenoom. Because of its colour it was not able to be used for all products; its main use was in pressure pipes and building products that were not able to be seen in detail, such as roofing products. The use of blue asbestos was discontinued on the recommendation of James Hardie's medical officer, Dr S.F. McCullagh, in 1967–68.

The asbestos content of Coy's asbestos cement sheet and pipes ranged from 8% to 15%, and was predominantly chrysotile with small amounts of crocidolite (to 1968) and amosite.

Production of asbestos cement pipes began in 1926 but the use of asbestos cement pressure pipe for water and sewerage use did not become widespread until autoclaving of pipes was introduced in the early 1950s. Asbestos content of pipes was approximately 15% of which about 12% was white asbestos and the remainder amosite. During the period 1956–1968 crocidolite was also used (about 2%).

Asbestos containing insulation products were first manufactured by Coy in the 1930s and by the 1950s Coy had established itself in the market with a product called 85% magnesia. In 1964 Coy formed a joint venture with CSR and Bradford Insulation known as Hardie-BI Company to make

and market insulation products. Major products produced were 85% Magnesia and K-Lite. Both products contained about 15% amosite. The partnership was dissolved in 1974 and Coy ceased production of asbestos thermal insulation products.

Jsekarb manufactured brake linings for motor vehicles, railway wagons and locomotives. Coy had initially entered the brakes and friction products market in the early 1930s and had a well established business by 1950 under the brand name Five Star . In 1963 Coy entered into the Hardie-Ferodo joint venture with Ferodo of the UK. Hardie-Ferodo carried out considerable product development work, particularly with regard to railway rolling stock brakes. With the withdrawal of Ferodo from the partnership in 1978, the business was renamed Better Brakes (later known as Jsekarb) and was ultimately sold to Futuris Corporation Limited in 1987. The only asbestos used in asbestos-containing friction products was chrysotile.

G. Litigation

Coy and Jsekarb, but particularly Coy, have been sued in respect of asbestos-related diseases in many cases in Australia.

The principal venue has been the Dust Diseases Tribunal of New South Wales, but not insignificant numbers of cases have been brought in the courts of other Australian jurisdictions.

In the course of such litigation it has been necessary for James Hardie to make admissions about its knowledge of the damage of asbestos at various times, and for findings to be made by courts on that quarter.

An example of admissions made is:

The Berry Admissions

Berry v Aultas Pty Ltd & Ors [9] where Coy made the following admissions in relation to the period 1949 to 1971:

1. It manufactured Hardie's 85 per cent Magnesia blocks, sections and plastic composition between 1949 and 1964.
2. It manufactured Hardie-BI Company 85 per cent Magnesia blocks, sections and plastic composition in partnership with CSR Ltd and pursuant to an agreement with CSR Ltd and Bradford Insulation Industries Pty Ltd between 1964 and 1971.
3. The composition of Hardie's 85 per cent and Hardie-BI Company 85 per cent Magnesia blocks, sections and plastic composition was approximately 10–15 per cent asbestos and 85–95 per cent basic magnesium carbonate.

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[9] (1997) 14 NSWCCR 266

4. It manufactured Hardie's Caposite blocks and sheets between 1949 and 1964.

5. It manufactured Hardie-BI Company Caposite blocks and sheets in partnership with CSR Ltd and pursuant to an agreement with CSR Ltd and Bradford Insulation Industries Pty Ltd between 1964 and 1971.

6. The composition of Hardie's and Hardie-BI Company Caposite blocks and sheets was approximately 95-98 per cent asbestos bonded with sodium silicate.

7. It manufactured Hardie's High Temperature blocks, sections and plastic composition from 1950 to 1964.

8. It manufactured Hardie-BI Company High Temperature blocks, sections and plastic composition in partnership with CSR Ltd and pursuant to an agreement with CSR Ltd and Bradford Insulation Industries Pty Ltd between 1964 and 1967.

9. The composition of Hardie's High Temperature blocks, sections and plastic composition was approximately 12 per cent asbestos, 44 per cent basic magnesium carbonate and 44 per cent diatomaceous earth.

10. It manufactured Hardie's Asbestos Millboard sheets between 1950 and 1964.

11. It manufactured Hardie-BI Company Asbestos Millboard sheets in partnership with CSR Ltd and pursuant to an agreement with CSR Ltd and Bradford Insulation Industries Pty Ltd between 1964 and 1971.

12. The composition of Hardie's and Hardie-BI Company Asbestos Millboard sheets was approximately 10 to 15 per cent asbestos and 15 to 20 per cent cement mixed with diatomaceous earth and other inorganic fillers.

13. It manufactured Hardie's K-lite blocks, sections and plastic composition from about the mid-1950s to 1964.

14. It manufactured Hardie-BI Company K-lite blocks, sections and plastic composition in partnership with CSR Ltd and pursuant to an agreement with CSR Ltd and Bradford Insulation Industries Pty Ltd between 1964 and 1971.

15. The composition of Hardie's and Hardie-BI Company K-lite blocks, sections and plastic composition was approximately 10 to 15 per cent asbestos and 85 to 90 per cent hydrous calcium silicate.

16. It manufactured Hardie's Super High Temperature blocks, sections and plastic composition from the late 1950s to 1964.

17. It manufactured Hardie-BI Company Super High Temperature blocks, sections and plastic composition in partnership with CSR Ltd and pursuant to an agreement with CSR Ltd and Bradford Insulation Industries Pty Ltd between 1964 and 1971.

18. The composition of Hardie's and Hardie-BI Company Super High Temperature blocks, sections and plastic composition was approximately 12 per cent asbestos, 44 per cent basic magnesium carbonate and 44 per cent diatomaceous earth.

19. The type of asbestos fibre used in the manufacture of Hardie's and Hardie-BI Company 85 per cent Magnesia blocks, sections and plastic composition was amosite and possibly a small amount of chrysotile.

20. The type of asbestos fibre used in the manufacture of Hardie's and Hardie-BI Company Caposite blocks and sheets, High Temperature blocks, sections and plastic composition, Asbestos Millboard sheets, K-lite blocks, sections and plastic composition, and Super High Temperature blocks, sections and plastic composition was amosite.

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21. No warning was printed, inscribed or otherwise attached to Hardie's and Hardie-BI Company 85 per cent Magnesia blocks, sections and plastic composition, Caposite blocks and sheets, High Temperature blocks, sections and plastic composition, Asbestos Millboard sheets, K-lite blocks, sections and plastic composition, and Super High Temperature blocks, sections and plastic composition to the effect that they contained asbestos or that contact with asbestos dust and fibre could cause asbestos-related disease.

22. Hardie's and Hardie-BI Company 85 per cent Magnesia, High Temperature and Super High Temperature blocks and sections were packaged in light brown-coloured cardboard cartons measuring approximately 38" x 18" x 18".

23. Hardie's and Hardie-BI Company 85 per cent Magnesia, High Temperature, Super High Temperature and K-lite plastic composition was packaged in jute bags weighing approximately 40 pounds until the late 1950s when impervious five-ply kraft paper bags stitched at the top and weighing approximately 25 to 30 pounds were introduced.

24. Hardie's and Hardie-BI Company Caposite blocks and sheets were packaged in timber crates measuring approximately 36" x 36" x 24".

25. Hardie's and Hardie-BI Company Asbestos Millboard sheets were packaged in bale-board crates measuring approximately 48" x 40" x 3" to 5" with the names of the product and the names Hardie's or Hardie-BI Company stencilled onto the crates respectively from 1950 to 1964 and 1964 to 1971.

26. Hardie's K-lite blocks and sections were packaged in light brown-coloured corrugated cardboard cartons measuring approximately 38" x 18"x 18" with green printing identifying the name of the product and the names Hardie's or Hardie-BI Company respectively from the mid-1950s to 1964 and 1964 to 1971.

27. It knew that Hardie's and Hardie-BI Company 85 per cent Magnesia blocks and sections, Asbestos Millboard sheets, Caposite blocks and sheets, High Temperature blocks and sections, Super High Temperature blocks and sections may have required occasional cutting with knives or hacksaw blades for the purpose of installation.

28. It knew that Hardie's and Hardie-BI Company 85 per cent Magnesia, High Temperature, K-lite, and Super High Temperature plastic composition required shaping when wet for the purpose of installation.

29. It knew that Hardie's and Hardie-BI Company K-lite blocks and sections may have required occasional skutching or cutting with knives or hacksaw blades for the purpose of installation.

30. It first became alerted during the mid-1940s to the suggestion that the inhalation of asbestos fibres could cause asbestosis, but only in circumstances involving the inhalation over a sufficiently lengthy period of time of considerable quantities of asbestos fibres contained in visible clouds of dust emanating from the handling of raw asbestos in its factory.

31. It first became aware during the mid-1950s that the inhalation of asbestos fibres could cause asbestosis, but only in circumstances involving the inhalation over a sufficiently lengthy period of time of considerable quantities of asbestos fibres contained in visible clouds of dust emanating from the handling of raw asbestos in its factory.

32. It first became aware in the late 1950s of the suggestion that the inhalation of asbestos fibres could cause lung cancer, but only as a rare complication of asbestosis in circumstances involving the inhalation over a sufficiently lengthy period of time of considerable quantities of asbestos fibres contained in visible clouds of dust emanating from the handling of raw asbestos in its factory.

33. It first became aware in the mid-1960s that the inhalation of asbestos fibres could cause lung cancer, but only as a rare complication of asbestosis in circumstances involving the inhalation over a sufficiently lengthy period of time of considerable quantities of asbestos fibres contained in visible clouds of dust emanating from the handling of raw asbestos in its factory.

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34. It first became aware in the mid-1960s that the inhalation of asbestos fibres could cause mesothelioma, but only in circumstances involving the inhalation of crocidolite fibres during processes involving the handling of raw crocidolite in its factory."

An example of a finding, which goes beyond the admissions in *Berry* is:

State Rail Authority (NSW) v Wallaby Grip Ltd [10] where Judge Curtis found that James Hardie had actual knowledge of the dangers of asbestos since 1938. His stated (at para. 108):

> 108 There is no evidence that between 1938 and 1950 the SRA had actual knowledge of the dangers to health posed by visible clouds of asbestos dust. Hardie did know. It is sufficient to refer to one exhibit only. SRA 26 revels that on October 1938 Hardie's asbestos factory at Brooklyn in Victoria was the subject of tests carried out by the Victorian Department of Health to determine the concentration of asbestos particles in the air. The results were sent to Hardie. The report stated that: *"Certain authorities regard 5,000,000 asbestos particles per cubic foot of air as the maximum concentration to which workers should be expose*d" and advised that where workers were exposed to such concentrations, even intermittently, they should wear suitable dust respirators. Any visible cloud of asbestos dust contains a concentration above 5,000,000 particles per cubic foot.

The finding of actual knowledge was not disturbed on appeal.[11]

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[10] (1999) 18 NSWCCR 193

[11] Wallaby Grip Ltd v State Rail Authority of New South Wales & Ors; James Hardie & Coy Pty Limited v State Rail Authority of New South Wales & Ors [2001] NSWCA 105 (24 April 2001)

APPENDIX "B"

18th June 2004
Case No: 1598/03

FINDINGS (WITHOUT INQUEST)

The death of Donald Rawson occurred on 21st May 2003 at the Royal Melbourne Hospital, Parkville, Victoria from 1(a) Malignant Mesothelioma.

Introduction

Mr. Rawson, aged 67 at the time of his death, had a varied working history, which is necessary to trace in order to identify, if possible, the source of his exposure to asbestos.

Work and environmental history

The police officer conducting the investigation for the Coroner, Detective Senior Constable Phillip Haywood, prepared a summary of his investigation which states:

"... 2. Mr. RAWSON began his working career as a motor mechanic apprentice with what appears to be little exposure to asbestos. He then worked for a steel merchant which involved some welding. He has no recollection of asbestos exposure during this time and his jobs varied, including working as a truck driver for another steel merchant.

3. In the early 1960's, Mr RAWSON worked for another steel merchant named Atkins Pty Ltd who were located in Geelong Road, Brooklyn which was not far from the James Hardie factory. It is noted that this time of employment was prior to the 1964 New York Conference where environmental asbestos pollution and mesothelioma were linked. (Refer KILPATRICK report pg.3 par.1).

4. Mr RAWSON continued working for steel merchants in a sales role with no exposure to asbestos. In the 1960's Mr RAWSON worked for a company named Benny Teare Pty Ltd in a sales role again. He left the company for a period to work as a truck driver for Four 'n' Twenty Pies before returning to work with Benny Teare in West Footscray. He had no recollection of seeing or handling asbestos products during that time. However it is assumed the company did sell asbestos products as per their competitor at the time, Blackwood's and McPherson's.

5. Mr RAWSON then worked for a pneumatic and hydraulic system manufacturer in Moonee Ponds between 1978 - 1993 with no apparent exposure to asbestos.

6. Around 1977 Mr RAWSON clad his Henry Street, East Keilor home with Hardie Plank. Contractors performed the cladding, however Mr RAWSON would clean up the debris and dust at the end of the day."

Apparently Mr Rawson was retrenched in 1993 and did not work after that time. Detective Senior Constable Haywood considers that the:

"... reports compiled by KOTTEK and KILPATRICK conclude that Mr RAWSON may have been exposed to asbestos in his workplace and/or at home. Mr RAWSON may have had exposure as an apprentice mechanic through brake lining dust, or when working as a welder, however these two possibilities appear unlikely due to the level of exposure. Mr RAWSON worked for companies that probably handled asbestos products, however he was in the sales department and not involved in servicing or installing. He worked relatively close to the James Hardie Plant

during the early 1960's and his home was clad with Hardie Plank around 1977 where he cleaned up the dust behind the builders. The attached reports raise various possibilities, but are unable to be precise as to the direct cause of the malignant mesothelioma that caused the death of Mr RAWSON."

Expert opinion

As part of the investigation Detective Senior Constable Haywood provided reports from Mr. David Kilpatrick (Hygienist and Ergonomist) and Mr. Michael Kottek (Occupational and Environmental Health Consultant).

Mr. Kilpatrick stated that he could only find two probable asbestos exposure situations of any significance for Mr Rawson. These are:

"Firstly, which will need further inquiries to establish it, was when he worked for an engineering and plumbing supply company known as Benny Teare Pty Ltd in the 1960's. At that time they were in Franklin Street in Melbourne and he worked for them for a few years until the company moved to Springvale and at which time he left this employment and delivered pies for Four 'N Twenty Pies, but rejoined Benny Teare when they moved to West Footscray.

At Benny Teare Pry Ltd he was in a small mezzanine office just above the showroom and engineering goods, pipes, plumbing supplies and industrial hardware was sold across the counter below. He has no recollection of seeing them sell asbestos products such as lagging and millboard, but as Benny Teare Pry Ltd was a competitor to Blackwoods and McPhersons, both of which companies did sell asbestos products over the counter, I think it rather unlikely that they did not handle the same products as those other two major industrial hardware companies. The only former workmate which Don Rawson thinks may be alive has an unfortunately fairly common name, Jack Kelly, and as Mr Rawson does not know where he lived then let alone where he lives now, it may well take a lot of ringing around. I will leave this to you in the first instance.

Both Blackwoods and McPhersons have had mesothelioma cases and it would certainly not be impossible to imagine that Mr Rawson may have had some exposure there. Mr Rawson notes this was not an open-plan mezzanine office but in fact was sealed off from the main showroom by a means of a wall."

And secondly:

"the other exposure, which undoubtedly occurred was when the Rawson's had their home in Henry Street, East Keilor, clad with Hardie Plank in about 1977. Although contractors did the c1adding, each night after work he would come home and clean-up all the dust and debris. He indicates this was quite a messy, dirty and dusty job.

I may be mistaken, but it is my understanding that Hardie Plank would only have contained a few percent of chrysotile by 1977."

On personal and occupational history Mr. Kilpatrick reports that Rawson *"started his working life as a motor mechanic apprentice, but had only very rare contact with brake linings. After a short time in this job the owner of the company died and the business closed."* He then had uneventful short term work leading to work for:

"a steel merchant in Kensington and worked there for a few years, and he started to learn welding at Footscray Tech in the evenings before he lost the sight of one eye when he was involved in an industrial accident. He recalls no asbestos used in this plant where roof trusses

were made, and he also does not recall the quasi-arc welding rods shown to him. As times were hard, this steel merchant would hire out his trucks and Don Rawson often was doing deliveries. Although he went to the Port of Melbourne wharves from time to time, he was never allowed out of the truck and does not ever recall seeing people handling hessian bags.

From time to time he would use asbestos gloves during the welding work he did at Footscray Tech but he does not recall them being particularly dusty."

Next Mr. Rawson worked for another firm of steel merchants, *"Atkins Pty Ltd in Geelong Road, Brooklyn where he worked for a few years as head storeman."* Apparently at that job Rawson recalled no asbestos exposure.

Mr. Fitzpatrick noted that:

"the Gee1ong Road steel merchant plant he worked at was not very far from James Hardie's factory in Hardie Road Brooklyn which is on the south side of the Geelong Road. I note, however, this would have been prior to the 1964 New York Conference where environmental asbestos pollution and mesothelioma were linked."

And Mr. Rawson: *"next joined another steel merchant HA Barnard in Salmon Street, Port Melbourne, where he worked on phone sales for a few years with no asbestos exposure to his knowledge."*

Mr. Rawson then went to work in the office of Stewart & Lloyds in City Road, South Melbourne (steel pylon sales) with no contact in the Latrobe Valley power station construction area. Next he went to work for Benny Teare Pty Ltd and:

"Between leaving Benny Teare in Franklin and rejoining them in West Footscray a few years later, during the period Benny Teare was at Springvale, Don Rawson delivered pies for Four 'N Twenty."

When Benny Teare Pty Ltd ceased operation Mr. Rawson *"joined a pneumatic and hydraulic system manufacturer in Moonee Ponds where he worked from 1978-93 with no asbestos exposure."*

Apparently when he was working for Benny Teare Pty Ltd Mr. Rawson married and purchased a house in Henry Street, East Keilor.

"He took an old hot water service out of the house and as the neighbour wanted the copper drum he and a neighbour delagged it, but he immediately identified a sample of rockwool blanket shown to him picking this out of a number of samples shown to him at the same time."

In a report to Mr. Rawson's solicitors dated 14th August 2002, Mr. Michael Kottek (Occupational and Environment Health Consultant) indicated that he had discussed Rawson's exposure with him and, as a result, Kottek says:

"it is clear that Mr Rawson has had some occupational and some domestic exposure to asbestos..."

Mr. Kottek's report presents a slightly different emphasis on the factual detail and conclusions. He states:

"When Mr Rawson was indentured as a motor mechanic apprentice he had some exposure to asbestos from brake maintenance and repair work and some (probably lesser) exposure from

gasket materials. While Mr Rawson used compressed air to de-dust brake drums, he did not recall grinding friction materials nor did he frequently carry out brake work."

And:

"When working for Dan Nugent over the period 1953-54, Mr Rawson recalled that he would frequently wear asbestos gloves and aprons while welding outdoors in Kensington. After 1954, Mr Rawson continued to weld at Kensington of and on up until 1959. On being shown a Quasi-Arc electrode, Mr Rawson was confident that he had not used such electrodes when welding, but he was unsure if the other welders could have used them."

On his work in the home Mr Rawson recalled:

"a number of instances of asbestos exposure at their house at 22 Henry St, East Keilor. He recalled that he lined a shower with asbestos cement sheet which he cut with Bentley Shears, he did not recall this as being dusty. The house was also extended, with the external lining of the extension being Hardiplank. This extension was mainly the work of a builder, and Mr Rawson's exposure from these two renovations is likely to be quite limited. Mr Rawson related one instance where he helped a next door neighbour recover the copper cylinder from a Braemer hot water service. He recalled this involved stripping internal insulation which may have been asbestos, however Mr Rawson's recollection was not particularly clear and he initially described the insulation as having a pink colour and latter as being more woolly than my samples of asbestos insulation. I am not confident that the insulation removed was asbestos, as the description is consistent with fibreglass. There are two other possible sources of asbestos exposure at East Keilor."

And:

"On being shown asbestos backed sheet vinyl, Mr Rawson recalled that when they first moved into the Henry St house, they installed sheet vinyl with an asbestos backing layer. This was subsequently removed by the Rawsons, after the builder had finished the extension. The removal of the sheeting would probably have been more significant than any exposure from the use of asbestos cement in the building works. I am presently unable to identify the manufacturer of the sheeting, but Mr Rawson recalled the vinyl had a blue leafy pattern. Finally, Mr Rawson recalled that the house at East Keilor had sprayed insulation in the ceiling space. It is unlikely that this would be asbestos, but it may be worthwhile to confirm this at some later time."

Finally Mr. Kottek concludes there are:

"a number of other possible sources of asbestos exposure. Mr Rawson was not especially confident that sprayed asbestos ceiling finishes would not have been present in the various offices in which he had worked, he also recalled that many of the offices were renovated at various times. None of Mr Rawson's workplaces were listed in Dr Kilpatrick's records, however these are not comprehensive of all sprayed asbestos in Melbourne. Similarly, Mr Rawson thought he had seen Asbestolux ceilings installed in some offices, although I am not confident that Mr Rawson is not confusing Asbestolux with rockwool ceiling tiles. In any event, he could not clearly recall locations where he had seen these possible 'Asbestolux' ceilings."

And noted that:

"for three or so years in the early 1960s, Mr Rawson worked as a storeman for William Atkins who were located on Geelong Road, Brooklyn. On the current boundaries of Brooklyn, any address on Geelong Road is between 500m and around 2 km from the James Hardie factory. I

omitted to question Mr Rawson on exactly where on Geelong Road he was located, and I suggest this be confirmed in the Pink Pages or Sands & McDougal Directory. While this is a somewhat speculative source of exposure, I note that the more certain and intense sources of Mr Rawson's exposure (welding paraphernalia at Dan Nugent, friction products in his apprenticeship and removal of vinyl sheeting) are to chrysotile only. In the period 1961-1963 the James Hardie plant will have been using crocidolite, and from what I understand environmental pollution would have been a real possibility in this period. It may be possible to prepare conservative estimates of exposure at William Atkins using records of emissions from the James Hardie plant. I suspect records or estimates of such emissions may have been required when licensing by the EPA commenced in the early 1970s. Presumably emissions a decade earlier will have been even greater."

Conclusion

On the material provided (including the expert reports) other than to say that there were many possible areas at both work and home where Mr. Rawson was exposed to asbestos, it is not possible to be more definitive as to where the source of his disease emanated. It is equally likely that the exposure came from one or other or even both sources.

COMMENTS

The History of Asbestos Exposure - a long term knowledge of risk

The report of David Kilpatrick (Hygienist and Ergonomist) dated 6th January 2003 provided to Mr. Rawson's solicitors sets out in some considerable detail the history of the first identification of a problem and the extent of the knowledge of the risk of exposure to asbestos fibre and its effects on health. It is interesting to note that the problem of asbestos **was first identified in 1898** in the Annual Report of the Chief Inspector of Factories and Workshops in England.

Kilpatrick notes there *"has been extensive documentation on the hazards of asbestos exposure over the decades) commencing around the turn of the century, with particular attention from the mid 1920s."* From his summary document key early dates can be observed from reports and research documents whereby the health and safety issue was recognized and highlighted. These dates are **1898, 1924** (first case in the British Medical Journal), **1927** (Journal of Industrial Hygiene - wearing of masks recommended), **1930** (Merewether and Price report to British Parliament - this report was reviewed in various journals), **1930** (Journal of American Medical Association), Asbestos Industry Regulations (1931) (UK), **1931** (Journal of Safety Engineering), **1933** (Medical Journal of Australia), **1934** (Report of Director General NSW - first case in Australia), **1934** (Monthly Labour Review, UK - review of the Chief Inspector of Factories: 53 deaths from asbestosis), **1934** (Lancet review of 100 cases of Asbestosis), **1936** (Inspector General NSW), **1937** (New England Journal of Medicine), **1938** (Threshold for occupational exposure developed in USA), etc. Kilpatrick's lengthy documentation and history continues almost to the present day.

It is useful to document this entire summary "*history*" section of his report. Clearly, the extent and lead-time of the knowledge and warning of risk in the areas of government regulators, the medical and research community and in industry is indeed, troubling.

"Inspector of Factories and Workshops, for the year 1898, HMSO 1900, in which "The Evil Effects of Asbestos Dust" was reported.

The first case of asbestosis in the English literature was reported by WE Cooke in the British Medical Journal in 1924.

In 1927, in the Journal of Industrial Hygiene, T Oliver discussed pulmonary asbestosis and recommended the wearing of masks, and ventilation, for the dustiest operations.

Merewether and Price, in their 1930 report to the British Parliament, highlighted the hazards attached to asbestos exposure in terms of fibrosis of the lungs. Merewether and Price paid particular attention, in this publication and others subsequent to that, to prevention of inhalation of excessive levels of asbestos dust.

The Merewether and Price report was reviewed in various journals in the early 1930s, including engineering journals.

In the Journal of the American Medical Association in 1930, it was reported that asbestosis victims were now eligible for workers compensation in the United Kingdom.

In the journal "Safety Engineering", Volume 62 (1931), F Wilson, in an article on dust and fume diseases, listed "asbestos and every operation in which it is used" as seriously harmful.

In the United Kingdom, the Asbestos Industry Regulations (1931) were gazetted on December 31, 1931 under section 79 of the Factory and Workshop act of 1901.

W A Edwards in the Medical Journal of Australia in 1933 included asbestos work as an industry which can cause "pneumonoconiosis".

In the report of the Director General of Public Health for New South Wales for 1933, published in 1934, the first recorded case of asbestosis was noted, this being a mill hand in an asbestos works.

In the Journal "Safety Engineering" in 1934, in an article entitled "Asbestos Dusts", it was stated that an asbestosis hazard existed wherever asbestos dust was created.

In the journal "Monthly Labour Review" in 1934, there was a review of the 1933 UK Chief Inspector of Factories report, which listed 53 deaths from asbestosis.

In 1934 in the Lancet, Wood and Gloyne in an article entitled "Pulmonary Asbestosis; A Review of 100 Cases" reported asbestosis in a number of people who used asbestos products, including a van boy aged 18 whose spare time during 2 1/2 years employment had been spent in mixing powdered asbestos in an open yard, a middle aged boiler riveter who had served his apprenticeship as a youth in a shop where asbestos was used for lagging pipes, and a man who had been employed handling asbestos mattresses in the open air at an aerodrome.
The condition of asbestosis was further discussed in the report of the Director General of Public Health for New South Wales for the year 1935 published in 1936.

In 1937, J B Hawes in the New England Journal of Medicine, discussing dangerous dusts, indicated that asbestos was the most dangerous dust.

The first internationally accepted threshold for occupational exposure to airborne asbestos dust came from the work in the United States of America by Dreessen and others in 1938.

This standard was five million particles per cubic foot (mppcf) of total dust including fibres, averaged over a working day. In metric terms, this is equivalent to 177 particles/mL.

Despite obvious scientific flaws in the epidemiological study of Dreessen and others, the standard seems to have been accepted internationally, and within Australia, and in my opinion it was the standard that was included in the 1945 Harmful Gases, Vapours, Fumes, Mists, Smokes and Dusts regulations under the Victorian Health Act.

In 1938, A J Lanza edited a book entitled "Silicosis and Asbestosis", London, Oxford University Press, in which the asbestos hazard was comprehensively discussed.

In the annual report of the Chief Inspector of Factories for the year 1938, London, Her Majesty's Stationary Office 1939, it was noted that of 103 fatal asbestosis cases, 11.6% had cancer of the lung.

In 1939, D O Shiels in the "Health Bulletin", a Victorian Government Journal, asbestos was discussed, and Shiels recommended that workers be informed of the risk, that dust counts should be made, and indicated that asbestos causes asbestosis.

In the next issue of Health Bulletin, D O Shiels expanded the section on asbestos, and noted that asbestosis predisposed the victim to TB.

In 1940, in the Medical Journal of Australia, an Australian case of asbestosis was discussed.

In a book entitled "Outlines of Industrial Medical Practice", London, Edward Arnold (1940), H E Collier noted that whilst the risk in asbestos industries was recognised and under control, the risk was now greater in incidental asbestos use, for example lagging work.

In the report of the Director General of Public Health, NSW, for 1938, which was published in Sydney by the Government Printer in 1940, asbestos was discussed in a section entitled "Dust Diseases of the Lungs". This discussed the asbestos hazard in a factory where insulation and fibro cement were made. Using the Owens dust counter, a dust level of 280 mppcf was recorded between the circular saws cutting magnesite - asbestos sheet.

In 1941 in the journal "Safety Engineering", a claim for total disability for fibrosis of the lungs was discussed, wherein the worker had been involved tipping both silica and asbestos into tanks, and it was stated that both of these powders caused fibrotic condition to develop in the lungs.

In 1942 Dr Warren Cook wrote in the journal "Industrial Medicine":

> *"<u>Criteria for Evaluation of Dust Hazard</u>*
>
> *In the first place, too quick snap-judgements should be guarded against. If an unjustified OK is given, the health of the worker may be jeopardized; if a condemnation, then money may be spent unnecessarily, to say nothing of developing a lack of confidence of management in your judgement.*
>
> *In the case of the asbestos dust condition, our evaluation of the exposure should be based on the knowledge that the present toxic limit for asbestos is five million particles of dust per cubic foot of air. This is a very small concentration, so small in fact that the condition may look good even to a critical eye and still present an exposure greater than this low limit. Some indication of the amount of dust present in the air may be obtained by noting the layer of dust on nearby settling places after learning how long a time has elapsed since they were last cleaned. If only a thin layer of dust has accumulated over six months or a year, and*

there are no visible puffs of dust escaping from the operation, it is probably that the condition is satisfactory.

In the case of asbestos dust, however, and this holds with even more certainty for dusts high in free silica content, the toxic limit is so low that the only safe procedure is to have recourse to actual dust determinations. This is especially important where the injurious condition is not immediately evident but requires years to develop as in the case of asbestosis and silicosis."

My own experiences in terms of measuring dust and observing dust levels is consistent with the comment made by Dr Warren Cook, that is that 5 mppcf of asbestos dust is a level which under most ordinary industrial circumstances is not necessarily going to be visible to the naked eye under normal lighting conditions.

In 1943, in the journal "Industrial Medicine", in an article entitled "Minimum Requirements for Safety and Industrial Health in Contract Shipyards", under the heading "Asbestosis" there was a listing of the sources of asbestos dust, with a general comment "In general, any job in which asbestos dust is breathed", giving examples of handling, sawing, cutting and moulding of asbestos and asbestos mixtures. The article noted that the job could be done safely with segregation of dusty work and either special ventilation or wearing of special respirators.

In the Journal of the American Medical Association in 1944 in an article entitled "Environmental Cancer", asbestos was include in a list of known or suspected occupational carcinogens.

In 1944 in the New England of Medicine, IR Tabershaw noting the asbestosis lung cancer risk, stated that it "seems too significant to be overlooked".

In an article in the journal "National Safety News" in April 1944 entitled "Fume Control in Shipyards", W. E. Lawrence, a safety engineer with a New York ship building corporation ill New Jersey, recommended for the use of asbestos insulation in ship work, to protect against dust or possible asbestosis, that material be dampened wherever possible, and that dust respirators be worn in addition to the provision of special ventilation. He also noted that periodic medical examination of those exposed was also necessary.

In 1945 the "Harmful Gases, Vapours, Fumes, Mists, Smokes and Dusts Regulations" were gazetted in the Victorian Government Gazette, stipulating a 5 mppcf standard for asbestos.

In 1946 in the Journal of Industrial Hygiene and Toxicology, WE Fleisher noted many very high dust counts from asbestos lagging operations on naval vessels, and three cases of asbestosis amongst the laggers.

In the Annual Report of the Chief Inspector of Factories for the year 1947, published in London by HMSO in 1949, it was noted that 13.2% of 235 deaths from asbestosis involved lung cancer.
In 1949, the report of the NH&MRC (27th Session) was published. The report refers to "Blue Asbestos Hazards in Western Australia".

In the Journal of the American Medical Association in 1949, an editorial discussed a link between asbestosis and lung cancer, and noted that many thousands of workers used asbestos.

In the popular science magazine "Scientific American" in 1949, in an article entitled "Cancer and Environment", G Conklin noted the asbestos lung cancer risk and further that carcinogens should be eliminated wherever possible and protective procedures used.

In 1950, the Third International Conference on Pneumoconiosis was held in Sydney, NSW. The asbestos hazard was discussed in various journals, including the Medical Journal of Australia.

G C Smith in the Medical Journal of Australia in 1950 reviewed occupational factors in pulmonary dust disease, and noted that asbestos causes severe pulmonary disease alter a shorter exposure than required for other pneumoconiosis.

In the Annual Report of the Chief Inspector of Factories for the year 1949, HMSO 1951, it was noted that portable asbestos spraying plants were used to an increasing extent by contractors on buildings, ships etc. for insulation purposes. The risk to health unless proper precautions were taken was noted.

In 1952, G C Smith writing in the Commonwealth Department of Health publication "Health" noted that asbestos can cause pneumoconiosis. Smith noted that it was the very small and invisible particles which caused the pneumoconiosis.

In 1953 the "Factory Health Safety and Welfare Encyclopaedia" was published, compiled by C. Conway Plumbe who was formerly superintending inspector of factories in the UK. On page 28 under the heading "Asbestosis" it was noted that "it is to be realised that asbestos dust is one of the most dangerous of all industrial poisons. No degree of care at all stages of handling, machining, mixing, cleaning, packing or unpacking etc of any material consisting of or containing asbestos is wasted effort". In the section entitled "dust" the reader is referred also to the section on asbestosis. In the section on "Regulations in Particular Trades", the 1931 UK asbestos regulations are summarized.

A McLaughlin in 1953 writing in The Lancet in an article entitled "Prevention of Dust Diseases" mentions the asbestos hazard, and notes that the exposure standards may not guarantee prevention and suggests that dust control is the only means of prevention.

CN Davies in 1955 in the book "Dust is Dangerous", London, Faber and Faber noted that there is now little doubt that there is a connection between asbestosis and lung cancer.

In 1955, Richard Doll published his well-known paper "Mortality From Lung Cancer In Asbestos Workers" in the British Journal of Industrial Medicine. I believe that this further established the connection between asbestos and lung cancer.

The report of the Director General of Public Health for New South Wales for 1948, published in 1955) discussed a visit to an asbestos mine in Northern New South Wales, and the use of asbestos as heat insulation in steel moulding.

In the report of the Director General of Public Health for New South Wales for 1950, published in 1956, a report was presented of an inspection made or a factory engaged in the manufacture of asbestos lagging. Dust levels at the breathing zone of a worker were determined at 280 mppcf.
In the report of the Director General of Public Health for New South Wales for 1951, published in 1956, in a section entitled "Asbestosis", the report noted six cases of asbestosis were described including a case developing after five years of spraying an asbestos bituminous cement for refrigeration purchases. It was noted that "there is good evidence to suspect that pneumoconiosis is widespread throughout industries handling or manufacturing asbestos products.

In the report of the Director General of Public Health for New South Wales for 1952, published in 1956, of 109 asbestos workers who were X-rayed, 8 had asbestosis and 18 had increased markings.

On Wednesday July 11th 1956 in the Victorian Government Gazette, under the Health Act, there was a declaration of certain trades to be Dangerous Trades. An extract from the proclamation is as follows:

> *"By virtue of the powers conferred by the Health Acts, I, the Governor of the State of Victoria, in the Commonwealth of Australia, by and with the advice of the Executive Council of the said State, and on the recommendation of the Commission of Public Health, do by this my proclamation, declare the following trades (whether ordinarily carried out on fixed premises or at varying places) being trades which unless preventive measures are adopted may become dangerous to the health of persons employed therein, to be dangerous trades within the meaning of the Health Act 1928.*
>
> *Asbestos lagging or spraying.*
> *Asbestos works or factories in which asbestos is used, manipulated, crushed or pulverized".*

Dr D L G Thomas' paper discussing his study of the "dusty trades" in Victoria, indicated on page 76 of the Medical Journal of Australia, January 19th, 1957:

> *"The following occupations are involved:*
>
> *handling the substance in its raw state; grinding the substance prior to its use in some process; mixing with diatomaceous earth or kaolin to form lagging materials; sawing, cutting and finishing of any product containing asbestos - for example, brake linings, asbestos sheeting and various insulating materials; tearing down old lagging - this is a very dangerous process, even in the open air; spraying asbestos on walls and ceilings as an insulator."*

On January 13th, 1956 in the Melbourne "Age", in an article entitled "Dust Becoming Bigger Hazard in Industry; More Workers Affected", a dusty trades survey carried out by the Victorian Health Department was reported, with 260 workers being X-rayed, 50 having asbestosis and 40 showing early signs. There was a similar article in The Age the next day (Saturday 14/1/56). There was another article in The Age on 5/2/57.

In the Melbourne based journal "Manufacturing and Management", in an article entitled "Dust Hazard in Industry", the Victorian survey was discussed and the asbestosis risk to asbestos workers including laggers was noted.

In 1958, WF Cooper writing in the journal "Australian Factory" noted that asbestos was a "destroyer of lung tissue" and notes the occupational exposure standard. He also noted that the prevention of asbestosis required dust suppression and ventilation.

In 1959 an international pneumoconiosis conference was held in South Africa, and the proceedings were published in 1960. IC Wagner published a paper on the occurrence of mesothelioma cases in the South African crocidolite mining district.

In 1960, IC Wagner and others, writing in the British Journal of Industrial Medicine, noted 33 cases of mesothelioma, all but one having asbestos exposure. Of the 32 cases with asbestos exposure, 13 cases had not been involved in the mining or milling operations but had simply lived in the vicinity of the mines or mills or lived on the wagon route.

In the textbook "Modern Occupational Medicine", edited by Flemming and D'Alonzo, asbestosis, lung cancer, and mesothelioma were discussed, and in respect of asbestosis, the following was noted, "Important features in all cases of asbestosis are the existence of a lag period between the

on-set of the symptoms and the inexorable progression of the disease despite cessation of dust exposure. There is evidence to support the view that the first few years of exposure to asbestos fibres are as important determinants of the final outcome as are most of the remaining years of exposure. Cases are currently cropping up in men and women who have worked as pipe insulators on Liberty ships during the second world war without since having had any further asbestos exposure".

In the report of the Director General of Public Health for 1958, published in 1960, a report was given on the hazards of limpet asbestos spraying. .

Further tests by the New South Wales division of occupational health for limpet spraying were given in the report of the Director General of Public Health for 1959, published in 1961.

In 1960, M Joseph writing in the Medical Journal of Australia, presented brief details on a number of Australian cases of asbestosis including one lagger, and noted the asbestos/lung cancer link.

WC Hueper in 1961 in Archives of Pathology, in an article entitled "Carcinogens in the Human Environment", noted that asbestos was recognised as causing lung cancer, and noted exposures to some product users and neighbourhood exposures.

In the report of the Director General of Public Health for New South Wales for 1960, published in 1962, dust concentrations above the recommended limits were found for the removal of filter bags from a hot air cyclone in an asbestos crushing plant.

In 1962, JC McNulty in the Medical Journal of Australia, noted the first Australian case of mesothelioma from asbestos exposure. This was a worker from the Wittenoom mine.

In the report of the Director General of Public Health for New South Wales covering the period from 1953 to 1957, published in 1962, a report was given of a major survey carried out in 1957 in a large Sydney factory manufacturing a wide range of asbestos products.

As well as the article by Wagner in 1960 on mesotheliomas in blue asbestos mining areas of South Africa, there were other articles published in the early 1960s indicating that exposure to asbestos dust was recognized as having a close association with diffuse mesothelioma and further indicating that in many of the cases of mesothelioma following exposure to airborne asbestos, the exposure was not continuous or prolonged, and in a number of cases the exposure was described as "minimal".

Even leaving out the risk of mesothelioma, when one looks at some of the articles published in Australia in the 195Os, one sees that the condition of asbestosis itself, that is fibrosis of the lungs caused by inhalation of asbestos dust, was known in that period to be a potentially terminal disease.

Referring to the extract from Mr Warren Cook's article in 1942, in respect to airborne asbestos dust and the toxic limit at that time, the only safe procedure in relation to determining the risk was to perform actual dust determinations.

By 1965, when the proceedings of the 1964 New York Conference on the Biological Effects of Asbestos was published, the situation was even more established in terms of risk, from the large number of professionals reporting on hazards of asbestos, including comments about the likely lack of protection offered by the old 5 mppcf exposure standard. In other words the exposure levels to asbestos dust needed to cause mesothelioma were much less than previously had been

thought to be hazardous, examples of causation being environmental exposure, and secondary exposure such as women washing their husband's work clothes.

PC Elmes et al in an article titled "Diffuse Mesothelioma of the Pleura and Asbestos" published in the British Medical Journal in 1965 stated that "it is concluded that there is evidence that exposure to asbestos, even though it may have been transient and many years previous, is an important factor in the aetiology of mesothelioma of the pleura. This conclusion gives cause for anxiety because of the increasing commercial use of asbestos". Also stated was "until recently most asbestos used outside the shipyards was in the form of corrugated roofing. This was imported from England and was usually cut and handled in the open under conditions of good ventilation. The use of asbestos in many industries, and especially in the building trade, is now increasing (for the times 1964), and this gives rise to anxiety that there will be an increased incidence of mesothelioma of the pleura".

Newhouse and Thompson in the British Journal of Industrial Medicine in 1965, volume 22, page 268 indicate a peritoneal mesothelioma for a woman whose husband was a railway carriage builder, lining compartments with asbestos sheeting, with work clothes washed at home. Whilst there is no proof that this was asbestos-cement sheet, one would have thought that this article would have alerted manufacturers to the fact that dust from "asbestos sheeting" could represent a risk to the user.

In 1966, Hourihane et al in an article in the British Medical Journal noted a woman with calcified pleural plaques who had been exposed 25 years previously when she had held asbestos sheets intermittently over a period of six weeks while her husband sawed them to made rabbit hutches.

Elmes in an article in the Post Graduate Medical Journal of 1966, under the heading "Use of Asbestos Goods" noted an asbestosis case of a woman who had helped her husband build two asbestos bungalows in 1947/48, holding the sheets while her husband sawed them up.

Gold and Cuthbert, writing in the journal Public Health (London) in 1966, in an article entitled "Asbestos-A Hazard to the Community" concluded that "in view of the grave hazards to health which even very short period of exposure to asbestos can eventually cause, the increased uses of asbestos must be viewed with disquiet. We feel that the time has come to take a hard look at the possible alternatives to asbestos before an epidemic of serious and irremedial respiratory diseases ensues".

In the newspaper "The Australian" of Tuesday October 28th 1968, an article was published about the concerns of the ACTU about asbestos. Professor Irving Selikov was quoted: "the public should be made aware of the problem. No one, particularly children and young people, should be unduly exposed. To days children are almost certainly inhaling more asbestos than their parents did, and we now know that if a person inhales sufficient amounts of asbestos dust, he carries a burden that will provide a latent potential for the development of cancer for the rest of his life".

In the report of the Director General of Public Health for New South Wales for 1964, published in 1967, it was noted that several processes were investigated including asbestos textile manufacture, laboratory testing, fibre crushing, and blending of various asbestos minerals, and noting some asbestos dust exposures in the range of 6.5 to 38.5 mppcf.

In the report of the Director General of Public Health for New South Wales for 1966, published in 1968, under the heading "Asbestos", it was noted "due to research overseas into carcinogenic effects of asbestos, often with minimal exposure, re-examination of asbestos cases found in

previous asbestos surveys has commenced, Sputum cytological examinations of long term employees are being earned out, It is hoped that these will lead to further information on health hazards of asbestos".

In 1968, the first Australian Pneumoconiosis Conference was held in Sydney and the asbestos hazard was discussed at this conference.

Dr JC McNulty in an article entitled "Asbestos Mining, Wittenoom, Western Australia" noted that the Health Department had first become concerned about dusty conditions in the mine and mill in 1948, although the first diagnosis of asbestosis was not made until 1958. He further noted that by 1968 103 men had developed pneumoconiosis, after excluding another 24 men who had mined elsewhere. He also noted "A particularly bad feature of Wittenoom was the persistent use of mine tailings for road surfacing, which exposed the townspeople and children to loose dust containing varying percentage of blue fibre". He also noted the case of p1eural mesothelioma which he had published earlier in 1962.

G Major in an article entitled "Asbestos Dust Exposure" described to the conference the dusty conditions at the mille and mill. He describes dust concentrations for hand bagging operators around 85 mppcf and 100 f/ml (fibres longer than 5 microns). He also describes a plant operator standing on the platform walking around inspecting parts of the plant equipment with dust exposure of about 85 mppcf including 270 f/ml (fibres long than 5 microns). He described dust concentrations for men on the picking belt of around 5 mppcf.

In 1968 the British Occupational Hygiene Society published a recommended standard for white asbestos (chrysoti1e) in air.

Two of the alternative indices for acceptable occupational exposure were:

> *2 fibres/cc by membrane filter method*
> *10 particles/cc by impinger method.*

It should be noted that 10 particles/cc by the impinger method is approximately equivalent to only 0.3 mppcf. Since 5 mppcf is likely to represent a level which maybe invisible to the naked eye, then certainly this new standard reflected the risk attached to exposing people to visible levels of airborne asbestos dust.

These standards whilst intending to reflect a working lifetime, were also eight hour time weighted averages.

In this BOHS report "Hygiene Standards for Chrysotile Asbestos Dust", published in Annals of Occupational Hygiene, volume 11, pages. 47 to 69, 1968, one reads information such as the following.

> *"As long as there is an appreciable amount of dust in the air, the committee recognises that there maybe some risk to health."*
>
> *"The primary danger of inhaling asbestos dust is asbestosis. It is generally recognised that there is also significant risk of lung cancer associated with asbestosis. A risk of mesothelioma of the pleura and peritoneum exists in connection with the inhalation of crocidolite dust in particular."*

"There can be little doubt that these risks will be at least in the lowest concentration, but the quantitative relationship between asbestos and cancer risk is not known, nor is it known exactly why these two are related nor even whether all kinds of asbestos present a risk.

Consequently it is not possible at this time to specify an air concentration which is known will be free of risk in this respect."

In the report of the Director General of Public Health for New South Wales for 1967, published in 1969, it was noted that the sputum cytology examination of long term employees in asbestos industries in continuing and an asbestos survey has been completed.

In the report of the Director General of Public Health for New South Wales for 1968, published in 1969, limpet asbestos spraying was reported and tests of the air in the breathing zone of the sprayer showed up to 250 mppcf. It was noted that assistants standing some distance away were also exposed to lesser but still hazardous amounts of asbestos.

In the report of the Director General of Public Health for New South Wales for 1969, it was noted that the medical branch had detected 19 new cases of asbestosis. Also, several investigations were made of the use of asbestos as a spray insulation and as a lining board. The hazards were found not only to some unprotected operators, but also because of the presence of other personnel not engaged in the process.

In 1969, in the Medical Journal of Australia, JEH Milne from the Victorian Department of Health, Industrial Hygiene Division, describes fifteen eases of pleural mesothelioma in Victoria, and amongst other occupations, lists mesotheliomata in a lagger, in Naval Dockyard workers, and in a person whose father worked at an asbestos cement factory.

In the proceedings of the International Pneumoconiosis Conference held in Johannesburg in 1969, published in 1970, E Walther noted that "the Asbestosis Research Council in the UK has reached the conclusion, and emphasizes the fact, that there is no hazard in the handling, working and fixing of asbestos cement products, provided certain simple precautions, outlined in their Code of Practice, are followed".

The Asbestosis Research Council in their recommended "Code of Practice for Handling, Working and Fixing of Asbestos and Asbestos Cement Products in the Building and Construction Industries" published in April 1967, recommended that when mechanical cutting or machining takes place in factories or in confined spaces, efficient dust extraction equipment should be installed or respirators of a type which are approved by the factory inspectorate should be worn. They also note that waste dust or rough cuts should not be allowed to accumulate in the working area and should be disposed of in such a way as to avoid escape of dust. Damping or wetting of waste before disposal was recommended. Vacuum cleaning was recommended to keep ledges, floors, trusses etc free from dust accumulation and it was noted that removal of dust by brushing should be avoided. It was also noted that operatives should wear overalls made from nylon or other synthetic material and should be free from open pockets etc. They further state that under site conditions, in general the same recommendations apply as for factory cutting. They further note that operatives should be advised on the precautions to be taken when cutting asbestos and asbestos cement products.

Also in 1969, E O Longley from the Department of Public Health, Sydney, wrote in the Medical Journal of Australia:

"Asbestos is seen as one of the most significant medical problems deriving from industry in the present age. As not only asbestosis but also carcinoma of the lung and mesothelioma of

the lung are accepted by the New South Wales Worker's Compensation (Dust Diseases) Board as compensable injuries provided that adequate industrial exposure to asbestos can be proven, it is important that all physicians should be acquainted with the three conditions and should, when they see conditions resembling carcinoma or mesothelioma of the lung, be alerted to make the fullest possible inquiries into the patient's industrial background and place of residence."

In Britain in 1969, the Asbestos Regulations, were gazetted as UK Statutory Instruments 690, with all asbestos operations to be required to be under extraction ventilation, or respiratory protection instituted.

The National Health and Medical Research Council in Canberra in 1969, in the 68th session of Council, published in 1970 its document "Atmospheric Contaminants. Hygiene Standards for Contaminants of the Air of the Workplace" and stipulated an occupational exposure standard for asbestos of 4 fibres/mL.

Bamber and Butterworth in 1970 in an article entitled "Asbestos Hazard from Protective Clothing" in the Annals of Occupational Hygiene noted hazardous levels of chrysotile even from the wearing of asbestos aprons and the use of asbestos gloves.

In March 1970, the UK Government released Technical Data Note No. 13, "Standards for Asbestos Dust Concentration for Use with the Asbestos Regulations 1969". A copy of this document is appended to this report. In this Technical Data Note, guidance was given on how HM Inspectors of factories would interpret the expression "Dust consisting of or containing asbestos to such an extent as is liable to cause danger to employed persons and how the measurements may be made". The levels regulated were as follows:

0.2 fibres/cc maximum for crocidolite
2 fibres/cc time-weighted-average for other asbestos types
12 fibres/cc maximum peak for other asbestos types

In 1972, R Barnes from the Workers Compensation (Dust Diseases) Board, Sydney, reported in the Medical Journal of Australia a number of cases of patients with asbestosis, including a lagger, a boiler maker who was often engaged in stripping old asbestos lagging from boilers and hot water pipes, and a 57 year old male who had been an asbestos worker for 17 years, mainly cutting asbestos cement sheets. With respect to the last-named patient he indicated that "these power saws are now exhaust-ventilated, but were not so in the early years".

In January 1973 an editorial in the Medical Journal of Australia noted that "workers outside the asbestos processing industry who handle asbestos materials may also be at risk and it is most important to carry out an educational program amongst workers in the house building and ship building industries for example, where the handling of asbestos products is quite common".

In the report of the Director General of Public Health for New South Wales for 1971, published in 1973, a report was presented in respect of asbestos dust exposure to truck drivers whilst picking up asbestos at wharfs and delivering to various importing agents and manufacturers, all involving Canadian shipments of chrysotile. The workers compensation (Dust Diseases) Board noted 30 new cases of asbestosis and further cases of mesothelioma and bronchogenic cancer related to exposure to asbestos dust.

The report of the Health Commission of New South Wales for the year ended 30th June 1974, published in 1975, it was noted that surveys of the handling of asbestos in industrial processes

had been undertaken that year. They also note 28 new cases of asbestosis, 1 case of asbestosis with lung cancer, and 3 cases of asbestosis with mesothelioma.

In 1975 the NH&MRC released its "Model Asbestos Regulations", which discuss hazards and control procedures.

In 1976 the NH&MRC released its "Membrane Filter Method for Estimating Airborne Asbestos Dust".

D O Shiels, in a letter to the Medical Journal of Australia on November 13th 1976, discussed the intended application or the 1945 Harmful Gases, Vapours, Fumes, Mists, Smokes and Dusts Regulations. He wrote:

> *"As long ago as 1945, the Harmful Gases, Vapours, Fumes, Mists, Smokes and Dusts Regulations 1945 of the Health Act specified the maximum permissible dust counts for asbestos particles for any occupation. These "blanket" regulations were designed to cover any circumstances of its use, Secondly, through evidence which was given to the Workers Compensation Board, patients received compensation for pneumoconiosis due to asbestos dust, in the 1950s. Thirdly, I personally carried out a large number of asbestos counts in a variety of occupations using asbestos. These were done many years before my retirement, which was in 1956. Fourthly, asbestosis bodies were first found in the sputum of persons suffering from asbestosis, in this Division in the late 1940s or early 1950s. Incidentally, the university professor to whom a sample was referred had failed to find them. Finally, in lectures to medical students, nurses, and health inspectors, asbestosis was described and illustrated. These lectures included reference to the carcinogenic effects of asbestos, the contrasting x-ray pictures in asbestosis and silicosis the time of exposure intervals and so on."*

In 1977 the NH&MRC produced its Approved Occupational Health guide to Asbestos. The hazards of exposure to asbestos dust and preventive measures were discussed.

In 1978, the Victorian Government introduced the Labour and Industry (Asbestos) Regulations, 1978, under the Labour and Industry Act 1958, these regulations being Statutory Rules 1978 No. 435.

In 1978, the NH&MRC produced the "Code for the Handling of Asbestos by Small Users" which discussed, amongst other things, the disposal of asbestos wastes and the cutting of asbestos-containing boards.

In 1978, the NH&MRC reduced the occupational exposure standard for asbestos to 2 fibres/ml."

As indicated the above summary, by Mr. Kilpatrick, of the history of identification of the risk of asbestos is useful from a coronial perspective.

Coroner's comment

This court has already highlighted the issue of deaths from exposure to asbestos in the case of Alban Atwood (Coroners Case Number 2153/99). Fitzpatrick's summary of the knowledge and history of risk adds to the useful information being collected by the State Coroner's Office on this important issue.

No doubt Mr. Rawson was exposed to the asbestos fibre (from which he subsequently acquired his disease) many years after the risk and consequences of exposure were well identified by governments, industry and the research community.

It should be observed that deaths associated with asbestos exposure are now being reported to the Coroner (see comments in Atwood, p.11).

As a matter of information copy of this finding will be sent to the:

- Attorney General,
- The Minister for WorkCover, and
- The State Coroner's Committee examining the issue of reporting an investigation of occupational disease.

Graeme Johnstone
State Coroner

ATTACHMENT

3rd August 2000
Case No: 2153/99

RECORD OF INVESTIGATION INTO THE DEATH OF ALBAN BASIL ATWOOD (WITHOUT INQUEST)

FINDINGS

The death of Alban Basil Atwood occurred on the 16th July 1999 at the Peninsula Private Hospital from 1(a) Generalised Hypoxia; 1(b) Pulmonary Atelectasis; 1(c) Bilateral pneumothorax with subcutaneous emphysema following biopsy of pleura with drainage of effusion for right pleural effusion due to fibrosis and mesothelioma. Contributing factors - II Ischaemic Heart Disease.

Recent medical history and events leading to death

Mr. Atwood, aged 86, worked as a plumber for various firms prior to his retirement in July 1975. On 10 July 1999 Atwood presented to his general practitioner, Dr. Stewart Bowman with shortness of breath. An x-ray was performed and a large right sided pleural effusion was discovered. He was admitted to the Peninsula Private Hospital where he died shortly after surgery.

Mr. Atwood had a history of shortness of breath with Chronic Obstructive Airways Disease (C.O.A.D.) identified as far back as 1986. In a report dated 16 September 1986, Mr. Malcolm Scott wrote that the:

> *'. . . problem is this dyspnoea on exertion and this tight feeling across his chest which takes away his breath rather than causes pain i.e. he really denied any pain to me even when specifically asked. It eases very quickly when he stops.'*

And on examination (in part):

'There is very significant C.O.A.D. with a peak flow of only 320, but no focal changes...'

Mr. Scott noted that chest x-rays did not disclose any *'significant abnormalities.'*

On presentation to Dr. Bowman various tests were conducted and, as indicated, Atwood was admitted to Hospital. Dr. Peter Cole reported on Atwood's admission to Peninsula. Cole wrote:

'Mr. Atwood was found to have a large right pleural effusion and was arranged to undergo a thoracoscopy, biopsy and talc pleurodesis.

At the thoracoscopy there were plaques over the chest wall characteristic of a malignancy and biopsy proved them to be extensive malignant rnesothelioma. It was thought at the time that if any of the lung could be pleurodesed to the chest wall it would limit the amount of build up of pleural fluid with its subsequent underlying poor lung expansion, and so talc was insufflated and drains inserted.

Following this procedure, he developed an air leak from the lung evident by bubbling in the chest drain, and he subsequently developed extensive subcutaneous emphysema. As the chest X-ray showed that the lung would not fill the lower half of the chest the air leak could not be stopped by waiting for pleural apposition and pleurodesis, and it was felt the drain should be left and that time would seal the lung.'

On the emergency that eventually lead to death, Dr. Cole reported that following surgery, he was:

'called urgently to the High Dependancy Unit because he was hypotensive and sweating and unwell. When I arrived I confirmed the findings and felt he must be having a myocardial infarct. The chest drain was still swinging with breathing and intermittent bubbling was occurring. Because of the incurable nature of the immediate surgical problem of the air leak and the overall incurability of the mesothelioma, no desperate measures were undertaken, apart from giving a dose of adrenaline which he did not respond to, and he passed away quietly from the myocardial infarct.'

It is noted that Dr. Cole reported the death of Atwood to the coroner because it *'occurred within 24 hours after the surgery it had to be reported...'*

Mr. Atwood's work history

- **summary**

Senior Constable King Taylor, from the Coroner's Assistants Office, investigated the circumstances surrounding Atwood's death. Taylor summarised the work history as:

'Mr. Atwood started a plumbing apprenticeship in 1929. He worked for Thomas Walker's Mechanical Services pre war then served in the Second World War from 1939 to 1945, and was employed by Mountain & Fraser (plumbing Co.) from the late 1940's till February 1975.'

As part of the investigation Senior Constable Taylor interviewed Jack Williamson, a practising plumber who has experience of the plumbing industry straddling the time of Atwood's working life.

- **pre-war**

Apparently Mr. Atwood worked for Thomas Walkers:

'... which had it's head office down in the dockland area. Thomas Walker's employees did a lot of work on ships, large buildings in the City, hospitals and blocks of flats.'

- **Second World War**

Mr. Atwood enlisted in the Australian Army in September 1941 and was discharged on 4 December 1945. Taylor indicated that from perusing his Army files it does not appear Atwood came '*into contact with asbestos during his enlisted years'*. During this period he attained various qualifications including mechanic, panel beater, painter and electrician.

In September 1999 Mrs. Eileen Atwood (Atwood's widow) made a claim in relation to his death to the Commonwealth Department of Veterans' Affairs. Initially the claim was rejected as not being '*related to service.'* It was alleged in the claim that death was caused by Atwood's '*smoking and drinking habits*.' The Delegate of the Repatriation Commission (Sandro Cardinali) decided that the cause of death was *'mesothelioma'* and that any exposure to asbestos fibres *'did not occur on operational service'*.

Following that decision Mrs. Atwood lodged an application for review and the decision was reversed on 7 December 1999. The Review Officer (Ron Fergusson) considered that *'Ischaemic Heart Disease contributed to the death. . . '* and that *'Mr. Atwood had a war-caused smoking habit that meets the requirements of the Statement of Principles for Ischaemic Heart Disease.'*

It appears that Mr. Atwood did not come into contact with asbestos during his time overseas at the War.

- **post war**

Mr. Atwood commenced working for Mountain & Fraser Plumbing in 1947 and retired in July 1975. Taylor ascertained from Geoff Peterken (Mountain & Fraser Plumbing) that Atwood initially worked from the head office of the plumbing business which was at 333 Collins Street, Melbourne. Apparently:

'Mr Atwood was employed as a sheet metal worker, cum installer of ventilation air conditioning and heating systems in the metropolitan area. He would have worked on institutional type buildings as well as commercial type buildings. At this time he would have spent 20% of his work time in the factory manufacturing the ducting and 80% of his time on site installing the systems.'

In 1958 the business moved from its Collins Street location to 18 Weston Street, Brunswick. Taylor's investigation indicates that:

'Mr. Atwood's employment changed only slightly after this move. He now spent 80% of his work time at the factory manufacturing the duct work and only 20% on site. This arrangement stayed in place till he retired in 1975, from the Clarke Street, East Brunswick factory.'

Asbestos and its general use in plumbing work

Senior Constable Taylor's investigation indicated that both before and after the Second World War Asbestos was used extensively in the plumbing industry. Asbestos cement (AC) sheeting and Asbestos *'Mill Board'* (compressed Asbestos) was used in the building industry until the 1980s from which time *'Villa Board'* has been used.

Senior Constable Taylor reports that:

‘4. Asbestos was also used in "lagging", a method of covering pipes for insulation Compressed asbestos would be wound around piping then covered with calico. This was not a great problem in itself until the asbestos had to be cut to cover a bend (right angle join) in the pipe. The technique used to cover a bend was called "bster back" joining. During this operation the asbestos would have to be cut many times which would allow the fibres to become air born and inhaled. Lagging was usually done by "laggers", i.e. unregistered plumbers, but was also done by plumbers when necessary.

5. Asbestos was also used to insulate Boilers. The boilers of this era were made of cast iron and needed to be insulated. The only method was for the plumber to place chicken wire over the outside of the boiler then mix water with powdered asbestos then place it over the chicken wire, thus forming a type of cast around the boiler. Packaged Boilers, i.e. already insulated, were not widely available till the 1980’s.

6. Asbestos was also used in fluing for domestic gas heaters, in the form of asbestos sheeting.’

And that the:

‘8. The work done on ships would have entailed lagging boilers and insulating piping. It would also have included work on navy vessels. A specific job on navy vessels was to insulate between decks. This was achieved by bolting sheet metal trays to the deck head above. The trays had asbestos powder layed out in them, they would then he raised to the deck head by the plumbers and held in place using their heads. The plumber would then locate a bolt by tapping the tray. Once the bolt was located the tray was forced upward till the bolt broke through the sheet metal, allowing the plumber to fasten the tray to the deck head. In doing this, asbestos would come away through the hole and drift in the air.

9. The work done by plumbers in hospitals, large buildings and blocks of flats would, apart from regular plumbing, include lagged plumbing for the heating of the flats. The plumbers would be in constant contact with asbestos doing this work, especially insulating boilers and pipes, inserting the flues and any other job that entailed cutting asbestos sheeting.’

The product *‘Mill Board’* was used by plumbers:

‘...during the installation of duct work for the heating and cooling systems. This board was used to line parts of the duct work, where large electric heating elements were situated, and would have to be cut with a ‘‘Stanley’’ type knife to fit. The cutting of the hoard would allow fibres to become air born and thus inhaled. Asbestos Mill Board like other asbestos products was fazed out of use in the early 1980’s.’

Post mortem report and the development of the disease

Dr. John Maynard, Specialist Pathologist, Victorian Institute of Forensic Medicine concluded:

‘1. Death was due to reduced oxygen supply to the blood from the lungs which had collapsed following a pneumothorax following pleural tap and biopsy for drainage of a pleural effusion. This is a recognised complication of the procedure.

2. The pleural effusion had accumulated because of the presence of pleural fibrosis and more particularly mesothelioma.

3. Mesothelioma is a malignant tumour arising from the mesothelial cells of the pleura and is commonly associated with asbestos exposure during life. In this case there was exposure to asbestos in his job as a plumber according to his son.

4. The ischaemic heart disease would have compounded the lack of oxygen and was a contributing factor to the cause of death.'

The extent of time for development of pleural fibrosis is about 10 years and the eventual development of mesothelioma following exposure to asbestos fibres can be variable and is generally long term in the vicinity of about 35 years.[1] Although, Woodford and Ranson also report that there are *'wide variations in this time frame..'* Those variations are considered by Sir Montague Levine in *'Levine on Coroners' Courts.'* Levine and his co-author James Pyke write that the intervals *'have been found to be seldom less than 20 years, usually 30 to 40 years, and sometimes as long as 60 years.'* [2]

It is noted that lung tissue samples have been retained but not tested as to asbestos fibre numbers and type.

Conclusion

Senior Constable Taylor comments that:

'It would appear that Mr. Atwood would have come into contact with Asbestos related products during his entire working life as a plumber. As to which era of his working life is the most likely to have contributed to his later ill health I am unable to say.'

It is reasonable to conclude that, as a plumber, working as he did over a period of about 45 years, Mr. Atwood was exposed to asbestos fibres. Whether the particular exposure (which eventually contributed to his death) was before the Second World War when he was employed by Thomas Walker's Mechanical Services or after the War when he worked for Mountain & Fraser Plumbing (or both) is difficult to identify.

RECOMMENDATION AND COMMENTS

The Findings, Recommendations and Comments will be forwarded to the Attorney General and the respective Ministers for WorkCover and Health for their consideration.

The reporting and coronial investigation of deaths from industrial disease in Victoria (e.g. Mesothelioma)

It is likely that Mr. Atwood eventually contracted mesothelioma as a direct result of his work as a plumber. He had a lengthy work history in the plumbing trade[3], which meant that it has been difficult to determine the precise circumstances and time at which he ingested the asbestos fibres that lead to his death.

The problem of death from mesothelioma will be a more significant and developing issue for our society over the next few years. Woodford and Ranson estimate that *'the annual incidence of*

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[1] Dr. N.Woodford and Associate Professor D. Ranson - Journal of Law and Medicine, Volume 7, Number 4 (May 2000) at pps. 347 and 349.
[2] Sir M. Levine and Jmaes Pyke - *'Levine on Coroners' Courts'*, Sweet & Maxwell, 1999, p.335. para. 33-11.
[3] It is noted that for the period 1994 to 1996 (in Australia) 62 plumbers were by recorded the National Occupational Health & Safety Commission's report on *'The Incidence of Mesothelioma in Australia 1994 to 1996'* as having contracted the disease (Note: this number is incidence and not necessarily deaths).

mesothelioma is not expected to peak until the year 2020.' [4] Whilst this figure relates to a specific occupation in Western Australia it is some indication of the potential for the Australian Health sector and for the Victorian community. The National Occupational Health & Safety Commission's *'Australian Mesothelioma Register Report, 1998 (Executive Summary)'* notes that:

> *'Australia has a long history of asbestos mining and production, as well as a history of importation of raw asbestos and heavy use of manufactured asbestos cement and other products.'*

And that Australia:

> *'has a very high and increasing incidence rate.'*

Over the last three years in Victoria there have only been three cases reported to the Coroner where mesothelioma was a potential cause of death. Dr. Matthew Lynch commented in an article entitled *'Natural Disease and the Coroner'* published in a recent edition of the Journal of Law and Medicine[5] that:

> *'The disease "mesothelioma" would have appeared on several hundred death certificates in Victoria in the last few years. However, between 1996 and 1998 only three deaths involving patients with mesothelioma were reported to the coroner. Two of these deaths occurred unexpectedly during medical procedures and one was a suicide. The reporting of these cases to the coroner was therefore unrelated to the nature of their underlying tumour pathology.'*

It is noted that the death of Mr. Atwood was reported to the Coroner by the treating doctor because it *'occurred within 24 hours after the surgery it had to be reported...'* Whilst the reasoning that it had to be reported because it occurred within 24 hours after surgery is based on a mistaken (but perhaps common) view within the medical profession of the Coroner's jurisdiction it should have been reported on another basis. That basis is either that that the death of Atwood from mesothelioma is *'unnatural'* or that it has occurred as a result of *'accident'* or *'injury'*.[6] The ingestion is presumably by *'accident'* and has resulted in an *'injury'* (albeit a long time ago).

These bases of reporting to the Victorian Coroner are also considered in *'Natural Disease and the Coroner'* by Dr. Lynch.[7] Lynch comments that:

> *'A recent high-profile case reported in the mainstream news media in Australia raises the problem of what constitutes a death that is reportable to the coroner. The circumstances of the case involved the tragic death of a young woman from a malignant tumour (mesothelioma). The case received media coverage because the young woman was allegedly exposed to the cancer-causing agent (asbestos) whilst employed in a government department. It was reported that her lawyers had secured an out-of-court settlement only days prior to her death from the disease. Indeed, it seemed for a time that she might die before her claim could be heard or settled. The Victorian State Coroner accepted jurisdiction to investigate the death, presumably on the basis that it was a death that was or might be a reportable death. The case is fascinating at a medico-legal level with respect to the potential extent of the coronial jurisdiction in the different catagories of reportable deaths.'*[8]

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[4] Dr. N.Woodford and Associate Professor D. Ranson – *'Asbestos-related disease'* in Journal of Law and Medicine, Volume 7, Number 4 (May 2000) , 347. (quoting de Klerk and Armstrong's 1989 research paper on *'Predictions of Future Cases of Asbestos-related Disease Among former Millers of Crocidolite in Western Australia'*).

[5] Dr. M. Lynch - Journal of Law and Medicine, Volume 7, Number 4 (May 2000), 345. Lynch is a Forensic Pathologist working at the Victorian Institute of Forensic Medicine. He also holds the degree of LLB (Hons).

[6] Coroners Act 1985 – Section 3 (*'Definitions'*) *'Reportable Deaths'* (e).

[7] Dr. M. Lynch - Journal of Law and Medicine, Volume 7, Number 4 (May 2000) , 345.

[8] Op cit p.345.

Dr. Lynch also examines the philosophy behind the modern coronial system and the Coroners Act 1985 (Victoria) when he writes:

> *'More importantly perhaps, the Act enables the coroner to make recommendations to the Attorney General on matters of public safety or the administration of justice. This is an addition to the more "traditional" domain of coronial power with respect to death investigation where the coroner must find, if possible, the identity of the deceased, how death occurred, the cause of death, and particulars required to register the death. It is this last mentioned function of the modem coroner, vis-a-vis injury prevention and wider community responsibility with respect to disease surveillance, that touches on the issue of mesothelioma and other is like diseases that arise in the setting of industrial or to environmental exposure to toxic agents.'*[9]

The extent of reporting and coronial investigation of industrial diseases such as mesothelioma is ultimately a matter for the government (as it will need additional resourcing and/or there may be alternative methods of investigating and recording these type of deaths). There is certainly a lack of attention to these cases[10] at many levels with a resultant potential for lack of awareness of specific systems issues and inadequate data on the true nature of the circumstances and death rates across a wide range of industrial disease processes. Dr. Lynch also makes the point that:

> *'The current position is certainly one whereby most such death are signed off by a treating medical practitioner as ''natural'' and thus are not subject to the glare of coronial scrutiny.*
>
> *If the coroner is to investigate unnatural or accidental deaths or those resulting from injury, there certainly needs to be some consistency. The community needs to be reassured that specific categories of death are either reportable and investigated or are not... '*[11]

In the United Kingdom, unlike Australia, coroners regularly investigate deaths from industrial disease. Historically, industrial diseases have been reportable to UK coroners under the category of '*unnatural'* deaths.[12] Also certain classes of '*industrial diseases'* [13] which are related to a specific occupation are '*notifiable'* by the coroner to certain agencies for purposes like Social Security (this procedure also assists in providing a clear line of documentation and information on the extent of the problem) or recording of deaths in mines. However, it must be noted that the list of specified '*industrial diseases'* under the Social Security legislation (or other legislation) is not exclusive for coroners' purposes and coroners may investigate industrial diseases where a particular occupation is not involved.

In 1999, in a publication *'Coroner's Courts – a guide to law and practice',* United Kingdom Coroner Christopher Dorries notes that in some UK coroners' jurisdictions:

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9 Op cit P.345.

10 For example Silicosis/Pneumoconisis in Mine Workers, cancers induced by industrial chemicals (bladder cancer in die workers, skin cancers in petroleum workers, nasal cancer in woodworkers, etc), disease caused by radiation exposure in the workplace, infectious diseases contracted in the workplace (ie. Legionaire's disease).

11 Dr. M. Lynch - Journal of Law and Medicine, Volume 7, Number 4 (May 2000) , 346.

12 See discussion in *'Jervis on Coroners'* (W.B.Purchase and H.W.Wollaston, Eds.), Sweet & Maxwell, Ninth Edition. 1957. at pps. 93-97. Also Dorries (C. Dorries – *'Coroner's Courts, a guide to law and practice'*, John Wiley & Sons, Chichester, 1999, p.45-46, para. 3.13.1) provides his own list for guidance in determining whether a death is reportable. He notes:

> *'The present requirements for reporting deaths to the coroner are a muddle of legislation, common law and varying advice. This is most unsatisfactory and in an effort to provide doctors in his jurisdiction with some clear guidance the author prepared the list...'*

In that list Mr. Dorries states that a death should be reported to the Coroner if *'the death could be due to an industrial disease or related in any way to the deceased's employment.'*

13 Defined under the UK Social Security legislation – *'Social Security (Industrial Injuries) (Prescribed Diseases) Regulations 1985.'*

'...industrial disease cases are by far the largest single verdict recorded. Although there are a vast number of recognised industrial diseases, the great majority arise from exposure to asbestos or coal dust.' [14]

Coroner Dorries also footnotes the comment that:

'...the proportion of verdicts of "industrial disease" returned by coroners has almost doubled in the last 10 years and in 1997 amounted to 1836 verdicts...' [15]

In Victoria, according to research undertaken by Dr. Lynch, over the last few years mesothelioma was recorded as having *'appeared on several hundred death certificates'*. For the three years prior to September 1989 the number reported to the Australian Mesothelioma Register in Sydney was about 109.[16] During that three-year period no deaths from mesothelioma were reported to the Victorian Coroner. Recent information obtained from the National Occupational Health & Safety Commission indicates that Mesothelioma deaths for Victoria are 1994-26; 1995-49; 1996-66.[17]

In 1995 the Industry Commission held an inquiry into Occupational Health and Safety ('*Work, Health and Safety*'). The Commission reported that each year in Australia *'between 650 and 2200 workers die as a result of occupational cancers – the majority from exposure to hazardous materials.'*[18] The Commission commented that:

'An understanding of the level, causes and cost of workplace injury and disease is essential to the development of effective and efficient prevention programs by individual workplaces, industry and government.'

In the process of examining the limits of the available information sources the Commission commented that the data contained in the National Data Set for Compensation-based Statistics is limited because it *'is based on workers' compensation claims...'* and that it *'significantly underestimates the extent of work-related injury and disease.'*[19] The Commission examined other sources of workplace injury and disease data and in particular Worksafe Australia's *'Work-related Traumatic Fatality Study'* of coronial records of *'traumatic accidents'* at work for the period 1982-1984. The Commission commented that the:

'Study excluded deaths from disease, as they are not usually investigated by the coroner.'[20]

The shortcomings and difficulties of the controls and research on both '*old'* and '*new'* hazardous chemicals are also discussed in the Industry Commission's Report - Volume 1, Chapter 13.

Coroners in Australia have potential to independently contribute to health and safety in the area of industrial disease. This is not a new idea. For example, in 1927 Mr. F. Danford Thomas (Ed) in *'Jervis on the Office and Duties of Coroners'*, wrote:

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14 C. Dorries – *'Coroner's Courts, a guide to law and practice'*, John Wiley & Sons, Chichester, 1999, p.106, para. 5.27.
15 C. Dorries, p.49, para. 3.13.10, footnote 52.
16 See also G. Johnstone - *'An Avenue for Death and Injury Prevention'* in *'Aftermath of Death'* Federation Press, Sydney, 1991, especially at pps. 160-161. The figure cited at p.161 (30 for the same three year period) of mesothelioma deaths reported to the Registry appears incorrect. At the time when the chapter was written (1990) that was the figure obtained from the Registry by the author.
17 Letter dated 3rd July 2000. It appears that between 1994 and 1996 5 plumbers died in Victoria as a result of mesothelioma. Generally see also National Occupational Health & Safety Commission's Report *'The Incidence of Mesothelioma in Australia 1994 to 1996 – Australian Mesothelioma Register Report 1999'* It should be noted that the incidence of mesothelioma reported to the Registry (now the National Health & Safety Commission) for the period 1994-96 is far greater than the deaths.
18 The 1995 Industry Commission Report ('Work Health & Safety') - Volume 1, Overview, p.xix.
19 *'Work Health & Safety'*, Vol. 1.p.7.
20 *'Work Health & Safety'*, Vol. 1.p.9.

'...The Secretary of State would take this opportunity of pointing out that in cases where death is due or suspected to be due to an industrial disease...an investigation directed by the coroner may be of great value not only in clearing up any obscurity as to the precise cause of death but also in bringing out all the circumstances contributing to the death, and showing, for example, how far the disease was due to neglect, on the part either of the management or of the worker, to observe the necessary precautions.'[21]

Yet some 70 years later, the issue of death from industrial disease is still not generally investigated by coroners throughout Australia (or specifically by any other agency in any systematic way).[22] Death from industrial disease arguably could be regarded as having originally been caused by an *'unnatural'*[23] (industrial) process, by *'accident'* or *'injury'* thereby coming under the jurisdiction of the coroner in Victoria. From the figures estimated in the *'Work Health & Safety Report'* the issue is a significant work-related health problem for our community.[24]

As already indicated, very few such cases are reported to the Victorian Coroner, probably as the disease is not generally considered by the medical profession as having resulted from an unnatural process or injury in the first place. In most cases the precipitating event (exposure) has occurred long ago and results in attendant difficulties for investigators in following the trail. But without a systematic method of investigating such cases there is potential for current health/safety controls to lapse and/or new products to be developed without adequate consideration for the long-term health consequences.

The Victorian Coroners Act 1985 does provide a legislative framework (and access to scientific expertise) to investigate some of these industrial disease cases. These classes of deaths, as an alternative to being regarded *'unnatural'* or having resulted *'directly or indirectly'* from '*accident'* or *'injury'* various industrial diseases, could become reportable deaths by being specified as having occurred *'in prescribed circumstances'* in Regulations to the Coroners Act. Currently there is no list of *'prescribed circumstances'*.[25] Perhaps certain classes of industrial diseases [26] should be so prescribed (although the current coronial legislation in Victoria already probably provides a sufficient legal basis [27] for reporting to the Coroner). Once specified in the Coroners Regulations *'prescribing'* industrial diseases may be a clearer method of providing guidance for the medical profession (and others) as to the need to report a death (in defined and limited circumstances such as a specified industrial disease) to the Coroner for investigation.

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21 F.D.Thomas (Ed) – '*Jervis on the Office and Duties of Coroners'*, Sweet & Maxwell, London, 1927, p.289.

22 See discussion by Perth (Western Australia) Coroner David McCann in his chapter *'The Range of Findings open to the Coroner'* in *'Aftermath of Death'* (H.Selby, QC., Ed.), Federation Press, Sydney, 1991. at pps. 17-18. McCann examines the issue of Industrial Diseases and the role of Australian Coroners. He writes:

'Deaths arising from apparent exposure to asbestos have been reported to Coroners in Western Australia from 1989 on the basis that it is reasonable to suspect that such deaths arise from non-natural causes...'

And:

'Now that industrial diseases arising from asbestos exposure are better identified, the question is what other industrial diseases might be causing deaths in the community, how can these be identified and what role will coroners play in drawing these dangers to the attention of the community...'

Apparently, in the early 1990s the Perth Coroner investigated about 150 cases over an 18-month period. There were difficulties in obtaining fibre counts and eventually resources difficulties meant that the coroner could no longer continue with these investigations. It is understood that the Western Australian State Coroner no longer investigates asbestos related death.

23 See discussion by Coroner David McCann in his chapter '*The Range* of *Findings open to the Coroner'* in '*Aftermath of Death'* (H.Selby, QC., Ed.), Federation Press, Sydney, 1991. at pps 16-17. McCann examines the meaning of '*natural causes'* and its limits in coronial cases.

24 *'The Work Health & Safety Report'* estimates that about 2000 deaths occur in Australia each year due to *'industrial disease'*.

25 See Coroners Act 1985, Section 3 *'Definitions' – 'Reportable death'* subsections (e) and (i).

26 See for example the list of dust diseases specified in the First Schedule of the Victorian Administration and Probate (Dust Diseases) Act 2000.

27 See Coroners Act 1985, Section 3 – Definition of Reportable Death (e).

No doubt the consequences of any new (and more defined) reporting arrangement [28] for specified industrial diseases (like mesothelioma or asbestos induced carcinoma) would mean a significant increase in the workload of the State Coroner's Office (and supporting investigative agencies such as Victorian Institute of Forensic Medicine,[29] Police and WorkCover inspectors) and thus any alteration in current reporting arrangements requires careful consideration. The Coroners' process is but one way of ensuring a reliable system of reporting, data collection and targeted investigation. Specific reported industrial disease cases could be initially evaluated for degrees of investigation and appropriate cases targeted for in-depth investigation, followed possibly by a public inquest.

Recommendation

The Attorney General (perhaps with the assistance of the respective Ministers for Workcover and Health) consider whether there should be improvements in the reporting to the Victorian Coroner of industrial diseases such as mesothelioma (improvements in investigation may also need consideration). The Attorney may consider that it is more appropriate to refer the issue to the Victorian Law Reform Commission for further examination.

Graeme Johnstone
State Coroner
8th July 2000

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28 Note: Even using the current provisions of the Coroners Act and developing improved education for the medical profession in the obligation to *'report'* deaths due to *'industrial disease.'*

29 In many cases an autopsy (or full autopsy) may not be necessary as lengthy medical histories may provide sufficient information for the coroner (on advice from the pathologist) to determine the cause of death on an inspection report or inspection report combined with a biopsy.

APPENDIX "C"

APPENDIX "D"

3 November 2004

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Mr Graeme Johnstone
State Coroner of Victoria
State Coroner's Office
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Dear Mr Johnstone

Draft Findings, Recommendations & Comments on the death of Christian Armand

Thank you for your letter of 5 October 2004 and for providing James Hardie with the opportunity to provide you with further information in connection with your draft report.

Let me begin by saying that James Hardie is prepared to consider supporting initiatives like those described in Recommendation 1 and Recommendation 2 of your draft report. We believe asbestos awareness programs such as those recommended have an important role to play in informing people about the potential dangers of asbestos. However we would like to consider the most effective way of implementing such programs. It is our hope that other former asbestos manufacturers, members of the construction industry and State and Federal governments will support those initiatives too.

We would like to take the opportunity to provide you with the following further information and comments in respect of some statements in your draft report which we believe are inaccurate or unfair to James Hardie.

1. The draft report appears to accept, at page 3, that no warnings were provided with James Hardie products prior to Mr Armand noticing those warnings some time during the 1980s.

   In fact, James Hardie asbestos cement products carried warnings from 1978 onwards. The warnings differed from time to time and from product to product, but were generally along the following lines:

   > CAUTION: This product contains asbestos. Breathing asbestos dust can damage health. Keep dust down. This product contains a small amount of asbestos bound firmly to it by cement and other materials. Asbestos dust can damage health. Keep dust down by following these simple rules:
   >
   > When sawing, drilling, etc. work in a well ventilated place, preferably outdoors.
   >
   > Use hand tools designed for cutting asbestos cement sheets such as fibro cutters or a score and snap knife or use an old handsaw. If cutting by power saw, use one which has a dust suppression attachment.
   >
   > Avoid drilling overhead where possible by pre-drilling before fixing.
   >
   > Damp down waste and dispose of it in a sealed bag.

   Prior to that, handling instructions had been included in the brochures accompanying all James Hardie's asbestos cement building products from June 1976. Those instructions were along the following lines:

All Hardie's asbestos cement building products may be readily cut on-site. The methods are "score-and-snap", hand guillotine, power and hand sawing. The process should always be carried out in open air situations or in well ventilated areas.

James Hardie would be happy to provide you with further evidence of instructions and warnings carried by James Hardie products should you wish.

2. Page 4 of your draft report quotes a section from Commissioner Jackson's Report which refers to James Hardie ceasing production of asbestos products in March 1987. That date relates to James Hardie ceasing to produce asbestos cement pipes. James Hardie's production of flat sheet asbestos cement, which appears to be the product to which Mr Armand was most likely to have been exposed, ceased several years earlier. In particular, James Hardie ceased production of flat sheet asbestos cement at its Brooklyn and Sunshine plants in Victoria in 1981 and had ceased all production of flat sheet asbestos cement in Australia by the end of 1983. Again, we would be happy to provide you with further evidence on this issue should you wish.

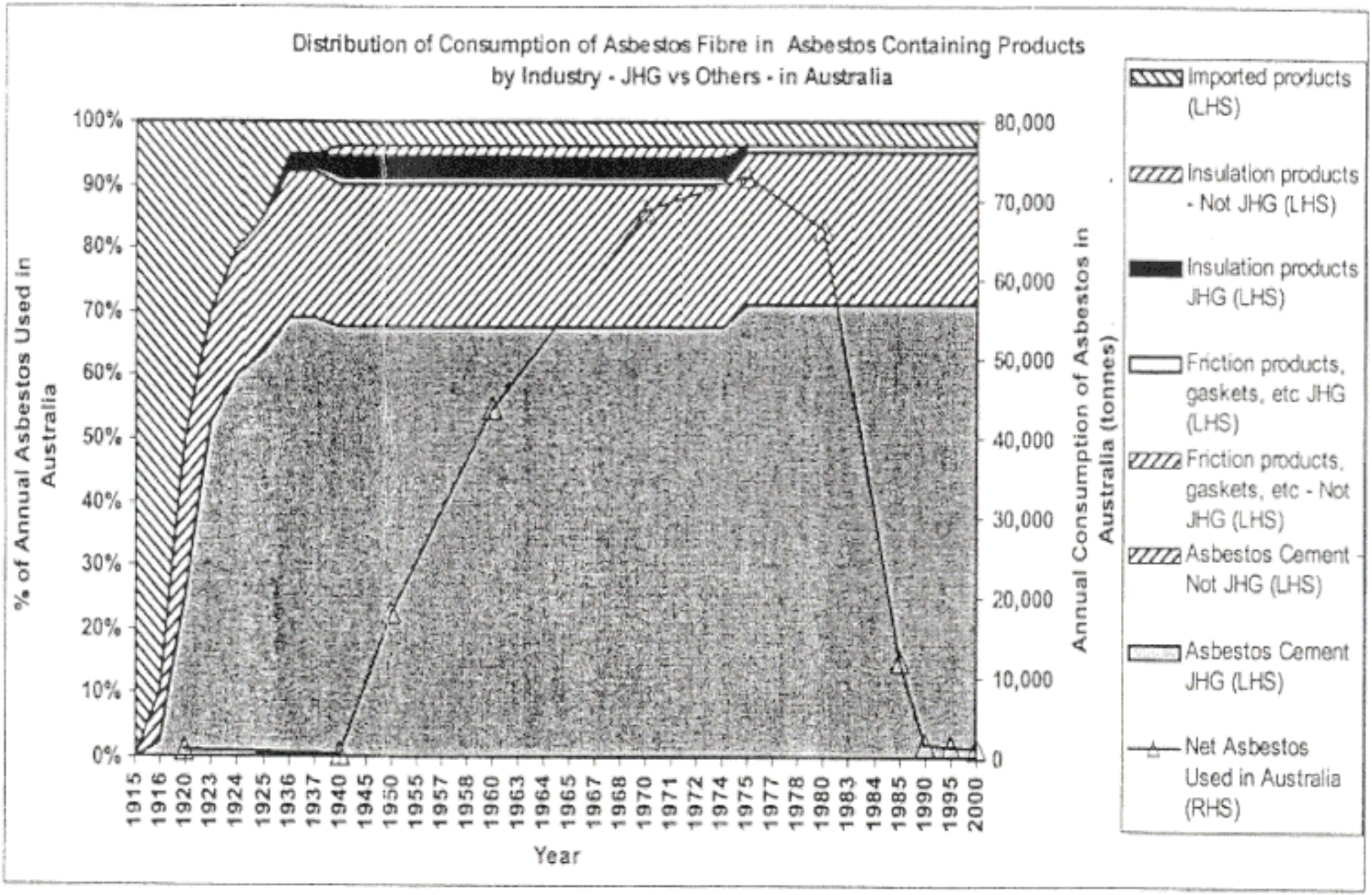
3. Our main concern is that the conclusions and recommendations in the draft report focus singularly on James Hardie, to the exclusion of other former asbestos manufacturers and others involved in the construction industry. This, in our view, is unreasonable given that James Hardie was one of a number of asbestos manufacturers in Australia. We have enclosed with this letter a graph which appeared in evidence before the recent Special Commission of Inquiry into the Medical Research & Compensation Foundation in New South Wales. As you will see from the graph, James Hardie was not the only manufacturer of asbestos cement products. In particular, other manufacturers' products accounted for approximately 25% of products sold in Australia.

   While you have concluded on page 4 that it is likely that James Hardie products were involved in Mr Armand's exposure to asbestos, given the length of time over which Mr Armand worked with asbestos products and the nature of his work, it is highly *unlikely* that products of other asbestos manufacturers were not *also* involved. We do not believe that there can be a logical basis for restricting your conclusion and draft Recommendations 1 and 2 to the James Hardie group of companies, as opposed to all companies which historically manufactured asbestos products sold in Australia. It seems possible that the recent publicity surrounding the Special Commission of Inquiry into the Medical Research & Compensation Foundation has focussed attention on James Hardie's role in asbestos manufacture in Australia, to the exclusion of all others. If James Hardie is to consider devoting resources towards a proposal along the lines outlined in your draft Recommendations, it would also be appropriate that other former asbestos manufacturers, and possibly members of the construction industry and State and Federal governments, can reasonably be expected to contribute to such a proposal as well.

Thank you again for the opportunity to provide you with these comments. If we can provide you with any further information, please do not hesitate to contact me.

Yours faithfully

Joanne Marchione
Legal Counsel - Australasia


Distribution of Consumption of Asbestos Fibre in Asbestos Containing Products by Industry - JHG vs Others - in Australia
% of Annual Asbestos Used in Australia
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Annual Consumption of Asbestos in Australia (tonnes)
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1915
1916
1920
1923
1924
1925
1936
1937
1940
1945
1950
1955
1957
1958
1960
1963
1964
1965
1967
1968
1970
1971
1972
1974
1975
1977
1978
1980
1983
1984
1985
1990
1995
2000
Year
Imported products (LHS)
Insulation products - Not JHG (LHS)
Insulation products JHG (LHS)
Friction products, gaskets, etc JHG (LHS)
Friction products, gaskets, etc - Not JHG (LHS)
Asbestos Cement - Not JHG (LHS)
Asbestos Cement JHG (LHS)
Net Asbestos Used in Australia (RHS)

STATE
CORONER
VICTORIA

State Coroners Office
57-83 Kavanagh Street
Southbank 3006
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Toll Free: 1800 136 852
(Only Country Victoria)
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5 November 2004

Ms Joanne Marchione
Legal Counsel - Australasia
James Hardie Australia Pty Ltd
GPO Box 3935
SYDNEY NSW 2001

Dear Ms Marchione,

RE: Draft findings, recommendations and comments on the death of Christian Armand

Thank you for your letter dated 3 November 2004. I have forwarded a copy of your letter and the attachment to the solicitors for Mr Armand's family. I understand that the solicitors will be providing me with a reply to the submissions in your letter.

In the meantime, I note your comments about the warnings on James Hardie products. As part of my investigation, could you please forward me copies of those warnings and also advise me as to the names of the other businesses you know were involved in the manufacture of asbestos cement sheeting products (referred to in paragraph 3 of your letter).

I would also appreciate documentary evidence about the ceasing of production of flat sheet asbestos at the Brooklyn and Sunshine plants in 1981 and ceasing all production in Australia in 1983. Other details about sales of any stockpiled or remaining asbestos cement sheet product supplied to the construction industry through distributors/retailers after those dates, would be appreciated.

In the meantime, I am reflecting on the comments in your letter and reviewing whether or not to alter the Finding as drafted. The additional material will be of assistance in this regard. I will also consider any submission provided by the solicitors for Mr. Armand's family (a copy will be supplied to you before I finalise the Finding).

I note that the Draft Findings refer to another manufacturer of asbestos cement products, namely CSR (see pp. 6 and 9).

/2

I appreciate your positive comments about supporting initiatives as referred to in the Draft Findings (Recommendations 1 and 2) and believe, notwithstanding the caveats in your letter (which I am considering), that this is a significant step for the health and safety of the general community.

Yours sincerely,

Graeme Johnstone
State Coroner

URGENT

James Hardie

Facsimile

To:	Katrina
Company:	State Coroner's Office
Fax Number:	03 9686 1506
Date:	17 November 2004
From:	Joanne Marchione
Subject:	**Victorian Coroner's findings**
Number of Pages:	1 (including this page)

James Hardie Australia Pty Lt
ABN 12 084 635 558

Level 3, 22 Pitt Street
Sydney NSW 2000, Australia

Telephone: (02) 8274 5215
Facsimile: (02) 8274 5217

GPO Box 3935
Sydney NSW 2001

Dear Katrina

Further to our various discussions I advise that the other manufacturers of asbestos cement sheets were:

- Seltsam (part of CSR) manufactured Asbestos Cement Sheets – examples see Rentz v Seltsam NSWDDT15 2004.
- Bestobells
- GPC. One of their products was known as "Tasbestos" and it was distributed throughou Australia (not just Tasmania where they were based).
- Wunderlich. Two of their products were known as "Durawall" and "Durabestos".

Unfortunately I do not have the full company names of these manufacturers.

Yours faithfully

Joanne Marchione
Legal Counsel - Australasia

EMAILED SUBMISSION FROM SLATER & GORDON LAWYERS :

17 November 2004

Apologies for the delay in responding.

We refer to the submissions made by James Hardie in the matter of Christian Armand, and advise that, according to our records, James Hardie & Coy Pty Ltd took over Wunderlich Ltd in 1977. As such, from 1977 onwards, James Hardie was the sole producer of the relevant asbestos products in Australia

If we can be of any further assistance, please do not hesitate to contact us.

Regards,

Andrew Baker
Asbestos Department
Slater & Gordon Lawyers
PH: 9602 8657

NEW SOUTH WALES DUST DISEASES TRIBUNAL

CITATION: Rentz v Seltsam Pty Ltd [2004] NSWDDT 15

PARTIES:
Janet Rentz
Seltsam Pty Ltd

CASE NUMBER: 280 of 2003 of 2004.00

CATCH WORDS: Negligence

LEGISLATION CITED:

CORAM: Curtis J

DATES OF HEARING: 18 July 2003, 24 March 2004, 25 March 2004

DECISION DATE: 25/06/2004

LEGAL REPRESENTATIVES

FOR PLAINTIFF: Mr AJ Leslie QC instructed by Turner Freeman
FOR PLAINTIFF: Mr JJ Fernon SC instructed by Windeyer Dibbs

JUDGMENT:

1. Niel Joseph Nielsen died on 19 August 2003 after contracting mesothelioma. Janet Rentz, his dependant widow and executrix, sues Seltsam Pty Ltd for damages.

Mr Nielsen's exposure to Asbestos

2. In about November 1973 Mr Nielsen and his then wife purchased a property at 224 Morrison Rd Putney as joint tenants. There was upon that property a garage constructed in 1951and clad then with asbestos cement sheets manufactured by the defendant. These sheets contained crocidolite, amosite and chrysotile fibres.

3. During the winter of 1974 Mr Nielsen carried out some repairs to a garage in the backyard of the property replacing two or three damaged sheets of fibro around the window on the west side of the garage. Mr Nielsen used old sheets stored in the rafters of the garage for the repairs. Those sheets appeared to have been left over from when the garage was originally built.

4. In carrying out the repairs Mr Nielsen said he went through in the order of 10 sheets. I think it improbable that so many sheets were left over from construction. From the photographs in evidence 10 sheets would have been sufficient to reclad the whole of the garage. I accept that five full size sheets may have been used. The sheets were old and brittle. They were cut by Mr Nielsen with a hand saw, rasped and fastened with hammer and nails.

5. Mr Nielsen in instructions to his solicitors communicated to Professor Henderson by letter of 24 June 2003 denied any previous asbestos exposure. In his oral evidence on 18 July 2003 he denied recollection of being exposed to asbestos and asserted that there was no time in my life when I said there was asbestos .

6. The absence of other exposure is critical to the plaintiff's case.

7. In 2002 Mr Nielsen made application to the Dust Diseases Board for payments in respect of his disease. On 2 August 2002, he attended upon Mr Ross Gardner, an advisory officer of the New South Wales Dust Diseases Board, for the purpose of giving to him a record of his industrial history and exposure to asbestos. He remained with Mr Gardner for between one and two hours. In later cross examination he said this:

> *Q You went there with the intention of making an application to the Dust Diseases Board. Correct.*
> *A Yes, as best I understood it, what they were doing.*

Q That was in respect of what you saw as exposure to asbestos during your working life in New South Wales. Is that right.
A Can I-if you like I can start with what he told me.
Q You understood that you were making an application to the Dust Diseases Board and what you were effectively saying was, I have been exposed to asbestos dust whilst I have been living and working in New South Wales over a period of time. Correct.
A Well, no, just over my life, I don't know.
Q Well, over your life but certain in New South Wales in respect of your application to the Dust Diseases Board.
A Yes he was asking my work history.
Q You understood at the time did you not, that any assessment of dust exposure that he was making must involve an assessment of any previous exposures you had in your working life before you came to New South Wales.
A I did but I didn't know it made any difference. I knew he would ask me about it all but I didn't know it would make any difference whether it was inside New South Wales or outside New South Wales.

8. Mr Gardner thereafter prepared a six page report on Mr Nielsen's industrial history. On 3 October 2002 Mr Nielsen signed each page of that report and a supplementary declaration as to his belief that this industrial history fairly represents the industrial history of my exposure to dust as given myself to advisory officer Gardner.

9. The report records Possible Dust Exposure in these terms

(i) *Mr Nielsen started work as a part time cleaner when still at high school, in 1957 and continued in this occupation until 1960.*
(ii) *When he left school Mr Nielsen was employed on a casual basis by the International Smelting and Refining Co who operated a lead smelter in Tovele, Utah, where he lived. Mr Nielsen worked for this company over a ten year period until 1969, during holidays University and Missionary Training, vacation breaks. Mr Nielsen estimates that he spent the equivalent of three years work time at the smelter.*
(iii) *In 1960 Mr Nielsen completed 6 months compulsory military service and on his discharge, trained as a missionary with the Church of Jesus Christ of Latter Day Saints. During the next five years Mr Nielsen trained and worked as a missionary spending some time in Denmark as a religious missionary.*
(iv) *At the end of his missionary work Mr Nielsen worked for about 12 months as a storeman for a large pharmaceutical company until commencing his tertiary studies.*
(v) *In 1965 Mr Nielsen enrolled at the University of Utah as a full time economics student. During this same period Mr Nielsen worked as a Hotel Night Clerk and in the holidays also worked at the smelting and refining company.*
(vi) *In 1969 Mr Nielsen obtained his degree and went to work for the Utah State Department of Transport as a Transport Economist, where he was involved in gathering information and investigating the logistics of road construction and maintenance. This work was principally office based with site visits averaging about 10% of the time.*

Smelter Work
(i) *Mr Nielsen started work at the smelter as a labourer but showing enthusiasm and ability was moved around to nearly all areas of the smelter during the time that he worked there. His initial duties involved working on the smelter floor where the ore was processed to obtain pure metal.*
(ii) *There were a number of furnaces and retorts used to heat the ore and then pour off the molten metal. All of the equipment was insulated against the intense heat and where refractory brickwork was used the joints between the bricks was sealed with asbestos paste made from asbestos powder and talc or other suitable filler.*
(iii) *Many of the smaller retorts were unable to be insulated with brickwork and these were covered with asbestos paste which was applied like render to achieve the required thickness.*
(iv) *Mr Nielsen recalls that in the course of his duties he had on a number of occasions poured the powder used to formulate the paste into a container and then mixed it with water before applying it to the relevant area being repaired.*
(v) *Mr Nielsen recalled that over the period that he had worked at the smelter because of his casual periods of employment he became familiar with nearly all of the operations carried out at the plant. This wide variety of expertise brought him into contact with many different jobs and he was frequently called on to perform maintenance tasks, such as lagging and insulation repairs. During the period that Mr Nielsen worked at the smelter he also worked as a hotel clerk, a storeman and also completed his university course as an economist.*
(vi) *On completing his university course in 1969 Mr Nielsen worked for the Utah State Transport Department for twelve months as a transport Planner before coming to Australia.*

Transport Planner

(i) In 1970 Mr Nielsen came to Australia and went to work for the NSW Transport Department.

(ii) After four years working directly for the Commission Mr Nielsen then carried out work for the Transport Commission through several consulting firms and also branched into other work which included projects for overseas clients of the companies where he was employed.

(iii) The areas where Mr Nielsen was employed include sites in New South Wales as well as overseas, they included, Laos, Thailand, Papua New Guinea, The Philippines, Mongolia, Indonesia.

(iv) One of the sites that Mr Nielsen worked on for some time was the construction of the Friendship Bridge between Thailand and Laos, in South East Asia. He also spent time in Indonesia on roadworks, which included the construction of bridges culverts and buildings.

(v) Many of the projects were carried out over a long period of time, Mr Nielsen would be involved in the initial site evaluation and feasibility study, then the proposed plan of the operation. The jobs would then be commenced and construction of the first stage carried out.

(vi) At various times during the construction of the first stage of the project, Mr Nielsen would be required to visit the site to evaluate progress and carry out further evaluation of the economic feasibility of further stages of the project. These feasibility studies required Mr Nielsen to work on many sites where the building or the surrounding building were being demolished were under construction or extensive renovation.

(vii) All of the building works created a very dusty dirty working environment aggravated by the building materials being used, such as asbestos cement products which were used for wall panels gutters and down and drain piping.

(viii) Mr Nielsen recalled that when working for the NSW Dept of Transport in North Sydney he worked in an office in a building surrounded by old commercial and residential buildings that were being demolished. He recalled that many of these buildings had corrugated fibro roofs and additions made of fibro. This material was being pulled down in close proximity to where he worked and as there were no safety precautions taken at the time, the material was disposed of in an indiscriminate manner, usually by being thrown into the back of a truck or onto the ground in a heap for disposal later. This produced a lot of dust that covered the site and surrounding area with dust and debris.

Heavy Machinery Use

(i) When large projects, both in Australia or overseas were in progress the following types of equipment had been in use, this also created a very dusty work environment which contaminated the work site and the surrounding area with large volumes of dust and subjected anyone in the area to the possibility of dust inhalation. Hand Tools, ie Shovels Picks mattocks etc, Trench Diggers, Bulldozers, Front End loaders, Graders and Scrapers, Jack Picks. The use of all of this equipment as previously stated, produced large volumes of dust and debris when excavating sites for development.

(ii) Mr Nielsen stated that he had in the normal course of his duties been required to work in buildings that were undergoing renovation. Working in these buildings being renovated was the result of contractual agreements between the company he was working for and the customer who, as a condition of the job required the company to refurbish the building they occupied when carrying out the work and to return it in good condition, renovated to the customers requirements on completion of the contract.

(iii) Most of these projects involved the use of standard building products which included asbestos cement sheet in all of its various forms. This asbestos cement material was used in the construction of temporary and permanent structures on the construction sites and also as partitioning and lining within the structure.

Insulation Spray

(i) Mr Nielsen recalled that on some of the sites where he worked it had been necessary to apply fire retardant insulation asbestos to structural members. The asbestos was sprayed onto the structure wet but the material was delivered in powder form, usually in Hessian bags. The mixing process released large amounts of dust into the atmosphere which contaminated the immediate area with dust and fibres.

(ii) A further source of contamination was the loose debris caused by overspray which fell onto the surrounding surfaces and was then broken up and dispersed into the atmosphere by the movement of workers in the area.

Site Offices

(i) Mr Nielsen recalled that he had spent a lot of time in site offices where tradespeople and contractors were in attendance. The dust and debris on the workers clothes contaminated the office, as well as the dust from the work being carried out on the site area.

(ii) The site office, often a temporary structure and also often constructed from asbestos cement sheet was usually situated in close proximity to if not on the work area. This proximity to the work which by its nature created dust and debris, exposed the office environment and anyone working in the area to the possibility of dust inhalation. Working in this environment, sometimes for months at a time exposed Mr

Nielsen to an intense degree of dust and dirt contamination. On many occasions this dust and dirt contained asbestos.

Summary

Mr Nielsen worked in a situation where he would spend part of the time in an office environment and part of the time working and inspecting work progress on site.
He estimates that he spent about half of his working life involved in on-site work where he was exposed to dusty dirty conditions caused by demolition, building and excavation. The remainder of the time in an office environment where the exposure to dust was minimal.
Many of the sites he worked on were in countries where safety standards were virtually non existent and work practices were questionable.
Mr Nielsen is of the opinion that some of these questionable work practices possibly exposed him to dangerous materials and also to levels of exposure that would not have been experienced in Australia.

10. In cross examination Mr Nielsen sought to distance himself from this history asserting that it was inaccurate. He was asked this question:

Q You are not suggesting that he invented this are you.
A Well, invented because I hate to say such a word but all that I understood was that that was- that's how he was interpreting what I was saying, but it isn't what I said, but he said this is the way they want it- this is the way the Board wants it, so I said, well, okay, but that wasn't exactly what I said and I told him at the time that that wasn't exactly what I'd said. He seems to have taken it a step further, he used terms that I wasn't familiar with.

11. The report is written in simple language. I cannot accept that it contains terms with which Mr Nielsen was unfamiliar.

12. I do accept that there may be assumptions, nuances and matters of relative emphasis recorded inconsistently with the narration of Mr Nielsen because the report was written by Mr Gardner as a summary of information volunteered by Mr Nielsen. Nevertheless I believe that by his signature Mr Nielsen affirmed the general tenor of the report confirming significant exposure to asbestos fibres in the course of his working life when he did lagging work at the smelter and when he was present during asbestos spraying on building works.

Causation

13. Before any credible conclusion is reached as to the potency of a cause, some quantitative estimate must be made in appropriate objective terms. Because the risk of contracting mesothelioma is correlative to exposure expressed in fibre ml years, the exposure of Mr Nielsen to the defendant's products must be calculated and expressed in such units. This exercise has been conducted by Mr Pickford for the defendant. No evidence is led by the plaintiff in reply and Mr Pickford was not challenged in cross examination upon his calculations. He estimated the fibre dose due to work on the garage if five sheets were used to be 0.0007 fibre ml years.

14. The significance of this figure is revealed by a table annexed to the report of Professor Henderson of 23 June 2003. This table summarises the risks of contracting mesothelioma from cumulative exposure to asbestos fibres. At a cumulative lifetime exposure of 0.005 f/ml/yr and lower, the table states that absolute risk is low- but quantitative uncertainties are very considerable .

This information is then recorded:

Crocidolite	Best estimate about 10 deaths per 100,000 exposed. Highest arguable estimate 55. Insignificant, possibly zero lowest. Best estimate falls to insignificant level at 0.0002 f/mlyr and highest arguable risk becomes insignificant at 6x10-6 f/mlyr
Amosite	Best estimate about 2 deaths per 100,000 exposed highest arguable lifetime risk 15 falling to <1 (ie insignificant) at 7x 10-5 f/mlyr
Chrysotile	Insignificant

15. Not all the fibre to which Mr Nielsen was exposed in the garage was crocidolite. The relevant sheets contained 1-2 per cent amosite, 4-5 per cent crocidolite and 8-10 per cent chrysotile in a sand and cement matrix.

16. If Mr Nielsen had suffered no other exposure, though his chances of contracting mesothelioma from the garage work were at best estimate less than one in ten thousand, the fact that he contracted the disease may permit of a conclusion that that risk had come home.

17. Where however he has other exposure that conclusion may not be available. For instance, the risk summary in the table discloses that for cumulative exposures to crocidolite fibres of 1.0 fibre ml years the estimate is of 650 deaths per 100,000 exposed.

18. Accepting that the disease in Mr Nielsen may be attributed to the totality of his fibre burden, I nevertheless am unpersuaded that the contribution of fibres released in the course of the garage repairs was material. Without some objective measure, estimate or even reasoned guess of his fibre burden from other exposure I just don't know.

19. By way of analogy, if a skier is careering toward an abyss there comes a point of no return when he cannot stop and he will plummet with or without a slight tap on his back insignificantly increasing his speed.

20. Professor Henderson was obviously aware of such difficulty when he expressed his opinion that the garage work was the cause of Mr Nielsen's mesothelioma. He went on to say that In particular, my opinion on causation is critically dependant upon Mr Nielsen not having sustained any identifiable occupational or other exposure to asbestos, apart from the three week episode of handyman type exposure sustained in about 1974/1975. (PX 8 Report 26 June 2003)

21. The plaintiff bears the onus of proving that the exposure from the defendant's products materially contributed to the total fibre burden which caused his disease. Where the exposure impugned is minimal and additional upon other exposure then, without some evidence permitting of some conclusion as to the total fibre burden, the plaintiff as a matter of law cannot succeed.

22. Verdict for the defendant.

Mr AJ Leslie QC instructed by Turner Freeman appeared for the plaintiff
Mr JJE Fernon SC instructed by Windeyer Dibbs appeared for the defendant