OUTER HOUSE, COURT OF SESSION

[2018] CSOH 78

PD460/16

OPINION OF LADY CARMICHAEL

In the cause

KAY GIBSON AND OTHERS

Pursuers

against

BABCOCK INTERNATIONAL LIMITED

Defenders

Pursuer: Di Rollo QC, Shields (sol adv); Thompsons
Defender: N Mackenzie; Weightmans (Scotland) LLP

25 July 2018

Preface

> "Claims for personal injury arising out of exposure to noise, vibration, or other health risks, particularly where the exposure was over a long period of time in different circumstances, notoriously give rise to difficulties. While it may be dangerous to generalise, the cases demonstrate, and common sense and fairness require, that unless it is clear that decisive evidence would have been relatively easily available, and that there was no good reason why it is not before the court, it is normally wrong for the court simply to shelter behind the burden of proof and dismiss the claim" *Harris* v *BRB (Residuary) Ltd and Another* [2005] ICR 1680, Neuberger LJ at paragraph 19.

> "It is important that judges should bear in mind that the Fairchild exception itself represents what the House of Lords considered to be the proper balance between the interests of claimants and defendants in these cases. Especially having regard to the harrowing nature of the illness, judges, both at first instance and on appeal, must resist any temptation to give the claimant's case an additional boost by taking a lax

> approach to the proof of the essential elements. That could only result in the balance struck by the Fairchild exception being distorted" *Sienkiewicz v Greif (UK) Ltd* [2011] 2 AC 229, Lord Rodger of Earlsferry at paragraph 166.

Introduction

[1] The pursuers are the children, siblings and grandchildren of the late Adrienne Sweeney ("the deceased"), who died of mesothelioma on 30 August 2015. The first pursuer also sues in her capacity as executrix nominate of the deceased. The pursuers seek to prove that the deceased contracted mesothelioma because she was exposed to asbestos when it came into her home on the working clothes of her husband, the late William Sweeney ("Mr Sweeney"). They seek to prove also that the deceased was so exposed to asbestos because of the negligence of the defenders, who employed Mr Sweeney between 1962 and 1971. Damages are the subject of agreement in a joint minute between the parties.

[2] The nature, extent and timing of any exposure of Mr Sweeney to asbestos while in the employment of the defenders is a matter of dispute, as is the date at which employers such as the defenders ought to have been alert to the risk of harm by way of secondary exposure to person such as the deceased.

[3] There is no direct evidence as to the circumstances of Mr Sweeney's employment with the defenders. The relevant period ended 46 years ago. Mr Sweeney himself died in 2008.

[4] The pursuers led hearsay evidence from Mr Joseph McCluskey, about statements he had taken from the deceased and from a Danny Watson. Mr Watson had also died before the proof. The defenders objected to Mr McCluskey's evidence on the basis that evidence was being led as to the content of precognitions. I allowed the evidence to be led subject to

competency and relevancy, as it seemed to me that I required to hear evidence in order to establish whether or not the statements he was speaking about were properly categorised as precognitions. In submissions the defenders withdrew their objection and accepted that the statements spoken to were not precognitions. Their submission was instead that very little weight could be accorded to the evidence, and that it was of very little value in establishing the pursuers' contentions. The pursuers also led evidence from James Brennan, from Mr Robin Howie, occupational hygienist, and from Dr Semple, retired consultant physician. The defenders did not lead any evidence.

[5] Mr Howie was present in court throughout the evidence of Mr McCluskey and Mr Brennan.

[6] This case provides a working example of the tension between the approaches described in the *dicta* already quoted. There is no direct evidence about the nature and extent of the exposure of either Mr Sweeney or the deceased to asbestos dust. There can be no criticism of any failure to capture Mr Sweeney's evidence. He died long before the deceased developed mesothelioma. Mesothelioma can have a long latent period. As time passes, it will inevitably become more difficult to obtain evidence from witnesses who worked in industrial environments, and it may be near to impossible to prove actual levels of exposure to contaminants in such environments. Those factors no doubt underlie the approach outlined by Neuberger LJ. On the other hand, defenders are entitled to a fair trial. If there is a suggestion that a "lax" approach to proof needs to be adopted, will that result in unfairness?

Preliminary matters

[7] Mr Mackenzie objected to the late addition of Mr Brennan as a witness, and to the late lodging of a letter written by Mr Howie. Mr Brennan's precognition, and Mr Howie's report, contained references to the cutting of solid sections of asbestos, which was not something that featured in the case on record. Mr Brennan's evidence was not obviously relevant, as he had not worked with the deceased, and the site was a large one.
Mr Brennan's name had been mentioned as a possible witness at the pre-trial meeting, but a motion to have him added had been dropped. Mr Howie's report contained evidence which was of poor quality. He had referred to precognitions in full, when those precognitions were themselves inadmissible. He had apparently relied on information from an English reported case as providing data relevant to his calculations. The defender's expert could not reach any conclusions because of the imprecise nature of the information presented by the pursuers.

[8] It seemed to me that the complaints were about lack of relevance and poor quality in the evidence, rather than that the defenders were prejudiced or being deprived of a fair hearing because of their late admission. The matters raised by Mr Mackenzie were matters which might potentially weigh in the exercise of my discretion in deciding whether or not to allow the late addition of a witness or lodging of a document. I considered, however, that if Mr Mackenzie's criticisms were correct, they could be ventilated by objection to evidence for which there was no record, and by testing what was said to be weak evidence in the usual way, by cross-examination and by submission as to its quality.

[9] Mr Di Rollo objected to certain late productions, including plans and other documents because he could not see their relevance. Again, I allowed the documents to be

lodged without prejudice to any objection that might arise on the basis of lack of record for a particular line of evidence.

Employment history of deceased

[10] The deceased's employment history as reflected in 6/24, a document produced by HMRC, was agreed. That disclosed that she worked for Motorway Tyres and Accessories (Scotland) Ltd in years 1977/8-1979/80, and for Clanford Motors Ltd in years 1980/81-1994/5 and 1997/8-1999/2000.

Evidence for pursuers

Joseph McCluskey

[11] Joseph George McCluskey is 43 years of age and is a paralegal employed by Thompsons, Solicitors in their Glasgow office. He has worked for Thompsons since 1993, and for the last thirteen years has been a paralegal. He undertook a paralegal course for which he received a certificate. He works in the pre-litigation team of the lung disease team. His work includes taking statements, carrying out company investigations and obtaining medical records at the start of a claim. He works only on asbestos-related cases, and for the last three years has worked only on mesothelioma claims. He sees about two or three new cases each week.

[12] Mr McCluskey spoke to the deceased in person in June 2015. He met her at her home in Paisley, and the first pursuer, her daughter, was present as well. It took him about an hour and a half to take the statement. The deceased was emotional, which was understandable in the context of her diagnosis, but was lucid, and he would not have known without being told that she was suffering from mesothelioma. The statement was produced

as 6/55. It was signed and dated by the deceased on every page, and she had made certain corrections to it, which were marked on its face. She had, for example, changed a reference to Liverpool to one to Birkenhead, and had corrected a reference to a Ewbank carpet sweeper.

[13] Mr McCluskey described the process by which the statement had come into being. He took handwritten notes during his meeting with the deceased (produced as 6/39). When he returned to his office he dictated a statement based on his notes, and then sent it out to her for signature. Mr McCluskey also spoke in full to his handwritten notes, which would not have been particularly easy to read without the aid of his oral evidence about them.

[14] In relation to her employment with Motorway Tyres, and Clanford Motors, the deceased did not know whether the mechanics used asbestos brake linings. At the former firm, she had to go on the garage floor to check invoices with the mechanics. At the latter she recalled dust in the body shop and in the loft. She visited the body shop several times a day to check invoices and query work done with the mechanics.

[15] I quote in full the parts of the deceased's statement relevant to my task.

> "After we married, we lived with my husband's mother for a period and this was a high-rise flat at George Court in Paisley before we got our first house in 1963. After coming up to Paisley my husband worked for a short period for Chrysler Motors before returning to work with Babcock and Wilcox. He worked with Babcock and Wilcox from 1961 until 1972 when he was made redundant and worked with them again from 1974 until 1992 when he was again made redundant.
>
> …
>
> As I have mentioned previously my husband worked as an engineer fitter with Babcocks and worked in the construction of the boilers. I do not recall ever having any discussions with my husband about his asbestos exposure but I do know that he did come home with asbestos dust on his overalls and his underclothes.

The first house me and my husband had was at 17 Calside in Paisley. We moved into this house in approximately August 1963. This was a terraced house with a front and back door and this was upstairs and downstairs and there was a front room, separate kitchen, separate bathroom and there was also a dining room area with an area like a wash house attached to this. It was in this wash house that I would was my husband's work clothes. I had a twin-tub washing machine there.

We lived at 17 Calside in Paisley until approximately 1973 …

I washed my husband's work clothes by hand throughout the period we lived at 17 Calside. I recall my husband during this period would carry his overalls to work and he would normally wear a pullover and jeans or old trousers under his overalls. He wore work boots and I sure [*sic*] he wore a cop when he was at work.

My husband was around 5 ft 8 in in [*sic*] height and I recall he did wear turn-ups on his trousers and on his overalls and he used to always turn the arms of his overalls up. When I had to wash his work clothes and his overalls I recall they were covered in dust and they were always manky. As a result I tended to wash my husband's work clothes separate from the rest of the families [*sic*] clothes because they got so dirty and dusty.

It is hard to estimate how often I washed my husband's overalls as on occasions he did have to change them regularly due to the state they would get in. I also recall the undergarments would also be covered in dust as he would tend to leave his overall top opened when he was working.

At the utility room where I did the washing at 17 Calside, this led to the back door of the house which led out to the garden, so before washing my husband's overalls I would normally shake them out at the back door. I would turn the pockets out and also turn the turn-ups down before washing them.

I then washed them my [*sic*] had in the twin-tub which had an area for washing the clothes and then an area for rinsing them. I then ran the clothes through a mangle and if the weather was good I would hang the clothes out in the garden but if it was during the winter we had a pulley in the utility room where I would hang the clothes.

I do not recall having a basket where I would leave the clothes as there were pegs in a cloakroom where he would sometimes hang his overalls if he was going to use them the next day. When my husband came home from work he would normally greet me with a cuddle while he still had his work clothes on. I recall he would normally carry his overalls under his arm. He also used to pick the kids up when he came into the house after coming home from work and give them a cuddle.

> Depending on what shift he was on he would sometimes sit and have his tea with his work clothes on or if he was particularly dirty he would go and get changed beforehand.
>
> A lot of the time he worked night shift and he tended to come in the back door when he was working night shift and would sit and have something to eat before he went to sleep and would still have his work clothes on.
>
> The floors at 17 Calside were mainly linoleum but in the living area we had rugs down. In the utility room where I washed the clothes, this was a linoleum floor. I used to sweep the floor regularly as I had small kids at the time who would be crawling about the floors so I tried to keep everything clean. I would have to sweep up any debris and dust and empty this into the bin.
>
> For the rugs in the house, I had a small cleaning apparatus like a sweeper that I called a Ewbank carpetsweeper. I used this to clean the rugs. This involved manually running the sweeper over the rugs and there was a compartment where any dust collected and I then had to empty this into the bin.
>
> …
>
> I recall at some point my husband stopped bringing his overalls home as the company started cleaning the overalls and providing fresh ones. I could not say for certain when this was.
>
> I don't think this was at any point during the period we were living at 17 Calside."

[16] At the end of his meeting with the deceased, Mr McCluskey asked if she knew about former workmates of Mr Sweeney, and she volunteered the name Danny Watson. Either the deceased or the first pursuer telephoned Mr Watson, and an arrangement was made for Mr McCluskey to speak to Mr Watson the following day. They spoke by telephone for about 15 minutes, and Mr McCluskey took notes of the conversation.

[17] The purpose of speaking to Mr Watson was to get his recollections of working with Mr Sweeney, the types of work they did, and of asbestos being used at the site. Mr McCluskey spoke with Mr Watson on 10 June 2015. Mr McCluskey was referred to his handwritten notes of his conversation with Mr Watson (6/40). No typed or signed statement was produced to the court.

[18] Mr McCluskey learned that Mr Sweeney and Mr Watson were in the same department. Both were engineer fitters involved in boilermaking. They worked together at Renfrew. They served apprenticeships together and then went their own ways and later came back together when they both had returned to the company. Mr Watson had described work involving the assembly of boilers. That was the main point where asbestos came into play. It was in the form of gaskets and rope, and labourers lagged boilers and blowers with asbestos. The two men had not worked directly together, but in the same department. The implication was that Mr Sweeney was doing the same things and was exposed to the same atmosphere. Mr Watson described a very dusty atmosphere from the processes involving asbestos. He was directly involved with asbestos gaskets and rope, and worked in the vicinity of labourers lagging boilers with asbestos. Mr McCluskey's note included the following:

> "Renfrew Site – Porterfield Road
>
> never worked directly with him – same department
>
> Bill was in assembly and tube area
>
> all over the works – all sort of fitting work
>
> fitting the boilers
>
> laggers on site – asbestos was everywhere
>
> heat resistant
>
> boilers and blowers all lagged – used asb gaskets. Put them on, rope asbestos lots of dust floating in the air
>
> saw Bill – lots of men worked with it used for packing boiler
>
> monkey dung – paste asbestos – labourers on the […] smoothed it all off – then painted over. lots of dust."

The reference to Bill was to Mr Sweeney.

[19] Mr Sweeney and Mr Watson grew up together, and served time as apprentice engineers together. Mr Sweeney was in the assembly and tube area. He worked all over the works, in all sorts of fitting work. Mr McCluskey noted that Mr Watson left Babcock and Wilcox in 1957 and spent 5 or 6 years in the Merchant Navy. The date 1964, overwriting "1963" appears in the notes, and seems to be the year that Mr McCluskey noted as that in which Mr Watson returned to work at Babcock and Wilcox. He said that "later on" masks were provided, but that he could not be specific as to when. Mr McCluskey asked him about overalls, and Mr Watson recalled that the workmen did take overalls home to be washed, and that they were dusty. Mr McCluskey 's note read:

> "[…] boiler – gaskets – making up rope sealed the door of the boiler. Lots of asb rope used.
>
> later on they supplied overalls once a week gave new ones
>
> dust on clothes underneath his overalls
>
> some men used to travel home in the car with Bill
>
> later on industrial masks but not in the early days"

[20] Counsel asked Mr McCluskey if it had been clear from what he learned from Mr Watson that asbestos was being broken up and cut. Mr McCluskey replied that Mr Watson spoke about dust being released from those processes. Dust had been deposited on to his clothing throughout his employment.

[21] Mr Watson spoke about paste asbestos being used for lagging for fire resistance. Although Mr McCluskey did not at first remember Mr Watson using the term monkey dung, when he referred to his notes, he found that Mr Watson had used that term. Mr Watson had referred to a Mr James Hester, a mate of the deceased's who had died the previous year. Mr Watson gave two other names, one said to have been a joiner, and the other said to have died from asbestos related illness. The account given by Mr Watson was

of a nature familiar to Mr McCluskey and was similar to accounts he had heard from a number of clients over the years. Mr McCluskey had heard similar histories of exposure to asbestos in the course of employment with the defenders at the Porterfield Road works.

[22] The end date of Mr Watson's employment with the defenders is not recorded in Mr McCluskey's handwritten notes. Mr McCluskey's evidence was that he understood Mr Watson to have been in the defenders' employment at the same time as Mr Sweeney.

[23] In cross examination Mr McCluskey accepted that the typewritten statement of the deceased was more extensive than his handwritten notes. He explained that the statement reflected his recollection of his discussion with the deceased the previous day. He accepted the word "manky" in the statement simply denoted "dirty" and that the deceased had not given any more specific description of the state of Mr Sweeney's clothes. The Ewbank sweeper had been used for cleaning rugs generally, and its use would not have been confined to removing any particular type of dust.

[24] He was questioned about his understanding of the deceased's account of shaking out Mr Sweeney's clothes. It was suggested to him that she had described Mr Sweeney removing his clothes at the back door after coming through the back garden. Mr McCluskey said that the deceased's account had been that she shook out the clothes at the time she came to wash them. He could not say whether the deceased would have met Mr Sweeney at the back door as he arrived with his overalls under his arm. She had not expanded on when the deceased would get changed. Sometimes he would sit and have his tea with his work clothes on, and other times he would change.

[25] Mr McCluskey was asked about receiving referrals from Clydeside Action on Asbestos, and accepted that he did. That was a charity that helped people who had

allegedly been exposed to asbestos, and their relatives. They would help with claiming statutory benefits. He did not receive referrals from Mesothelioma UK.

[26] The first pursuer had been present throughout Mr McCluskey's conversation with the deceased. He could not recall whether he had heard the telephone call made to Mr Watson by the deceased or the first pursuer. He was aware that the first pursuer had had advice from Clydeside Action on Asbestos, and had carried out some research that had led her to Mesothelioma UK, before she spoke to him. She had made it plain that she believed that Mr Sweeney had been exposed to asbestos while working for the defenders.

[27] So far as Mr McCluskey was aware, Mr Watson had not been a client of Thompsons. Mr Watson had grown up with Mr Sweeney, and knew the deceased as well. Mr McCluskey "had no doubt" that Mr Watson wanted to help. There was no note as to any indication given by Mr Watson as to when overalls were supplied, when masks were supplied, how often Mr Watson worked with laggers, how close to them he worked, or for how long. There was no note of where in the premises Mr Watson worked, or of the various duties that might be carried out by an engineer/fitter. There was no note of Mr Watson's having seen Mr Sweeney working near people using monkey dung. There was no detail of what Mr Sweeney did, other than that he used gaskets for packing boilers. Mr McCluskey had not been involved with James Brennan as a client.

James Brennan

[28] James Brennan is aged 70, and is retired. He worked for the defenders between 1963 and 1968 as an apprentice engineer fitter, at the Porterfield Road works in Paisley. The work that was done in those works was the manufacture of boilers and parts for boilers. The boilers were used in power stations and factories and on ships as well. Asbestos was used where he

was. At first Mr Brennan seemed to indicate that he had learned at a later stage, by internet researches, that the defenders had used asbestos. He was asked whether he could say whether asbestos was used when he was working for the defenders, and he replied in the affirmative. He was asked how he knew, and replied that he started to investigate the matter on the internet and found out that the defenders had been using asbestos and did not stop until the mid-1970s. He was asked if was aware of it at the time that he was doing the work, and he replied, that he did not. No-one had told him that asbestos was being used. He said, "… you weren't informed of the material you were working with." Later in his evidence he said that asbestos rope had been called asbestos rope at the time, but that he had not been informed that it was harmful.

[29] In the course of Mr Brennan's evidence objection was taken to his evidence regarding the cutting and drilling of sections of asbestos to make them fit the boilers, on the basis that there was no record for this line of evidence. I allowed the evidence to be led subject to competency and relevancy, on the basis that it might be covered by the following averments:

> "[Mr Sweeney"] was employeed as an Engineer Fitter. The boilers which were built in the factory were lagged with asbestos insulation and required asbestos gaskets and the use of asbestos rope for sealing doors and valves. William Sweeney used this asbestos rope and gaskets and was in close proximity to insulators who were applying asbestos in the form of 'monkey dung' to the pipes and boilers throughout the factory premises."

At page 9C-E there then follows a detailed description of the production of asbestos paste or monkey dung. Mr Di Rollo submitted that there had already been evidence led along similar lines without objection. He had asked Mr McCluskey, in relation to the account he got from Mr Watson, whether it was clear that asbestos was being broken up and cut.

[30] Mr Mackenzie maintained his objection at the close of proof. I sustain that objection. The defenders are entitled to have notice of the processes that the pursuers say were carried

on and which resulted in exposure to Mr Sweeney. Although, for reasons I discuss more fully below, it is very difficult to assess with any real accuracy the level of exposure of an individual in a historical case, the nature of the processes undertaken will have a bearing on the evidence available to the court about exposure levels. The literature includes different assessments as to the asbestos fibres per millilitre of air generated by different processes. The general averment about boilers being lagged with asbestos insulation is in the context of a passage of pleadings which then specifies three particular ways in which asbestos was used. The defenders were entitled to proceed on the basis that it was about those three uses of asbestos that evidence would be led. I narrate the evidence that he gave, but I have excluded, in assessing liability, his evidence regarding the lagging of the boilers with light coloured powdery material, and the shaping and cutting of it with cutting tools and drills to get it to fit. I did not consider that the absence of objection to the question mentioned in the preceding paragraph barred objection at the point it was taken. I had in mind also what was, in my view, the ambiguous answer given by Mr McCluskey, which was, "He [Mr Watson] spoke about dust being released from those processes." I discuss the significance of that answer more fully below. It was not clear to me that Mr Watson had given an account of processes of the sort mentioned from Mr McCluskey's response to what was a leading question.

[31] As regards the lagging of boilers, Mr Brennan said that once he and his colleagues had finished, other employees would move in and lag it to insulate it, and someone would then put sheet metal around it to hold it together. The lagging was light coloured powdery material. The people working with it shaped it and cut it to get it to fit. A white or light coloured dust was produced as a result. It got on his clothes and he breathed it in. He did not remember receiving any warnings about it or there being any precautions in force related to

its use. This happened regularly throughout the time he was working in the assembly shop. Anyone working as a fitter assembling boilers would be in a similar position to his own.

[32] The product would be worked and shaped by cutting tools and drills. The dust was not just in the air but lay on the metal work he was working on. Insulating material and dust lay about the floor. Asbestos cloth seal was used to seal boiler doors. It was shaped using shears. It was called asbestos cloth at the time, but no-one knew it was "bad for you".

Mr Brennan did not know Mr Sweeney. He confirmed that most fitters would use asbestos rope, also known as asbestos packing, to pack steam valves. It would be cut with a knife and sometimes it had to be hammered down to get it into the required shape. He saw monkey dung used. If there were gaps or spaces, employees would mix monkey dung and use it as a paste to fill in the gaps, using their hands. It was mixed in a drum using a big stick. Its production generated dust. "The insulating boys" worked with the monkey dung. In the assembly shop where he had worked for around 12-15 months that work would be going on regularly.

[33] Mr Brennan acknowledged that he had himself thought about making a claim against the defenders himself in relation to his time working there, and that he was a client of Thompsons. He denied that he was interested in giving evidence that might be helpful to his own case.

[34] He accepted that insulation would generally be applied to boilers at the end of their production. He agreed that the premises were very large, and composed of many buildings. He had worked in five of them during his time as an apprentice. These were assembly, tubing and manifold, the drum shop, the foundry, and one other that he could not recall. He described the tubing and manifold department as being housed in a building perhaps seven times the length of Parliament Hall. He was referred to 7/6 of process, which he agreed was a

plan of the premises, showing a number of buildings separated in some instances by railway tracks. The drum shop had been of a similar size to the tubing and manifold building. The foundry was about two-thirds of the size of the drum shop. The assembly department was perhaps five or six times the size of Parliament Hall. Mr Brennan was referred also to an organisational chart at 7/7 of process, but was not able to assist with some of the terminology mentioned on it as apparently defining different operations. He said he had worked with superheaters and economisers in the tubing and manifold areas, and with boiler structures in the assembly shop. He was shown a diagram of a boiler on page 16 of 7/7, and said that that type of boiler would be assembled on site; it would be manufactured at the defenders' premises.

[35] He was asked whether engineers would work in one place, and replied that as an apprentice he had been asked to move from department to department to learn as many skills as possible, but that he could not say that an engineer would be asked to move. He accepted that time-served fitters could serve in any one of a number of departments.

[36] In re-examination he stated that the processes and use of asbestos he had described had taken place in the assembly hall.

Mr Robin Howie

[37] Robin Howie is an occupational hygienist, and is aged 72 years. He has been a member of the Institute of Occupational Medicine since 1970. His curriculum vitae (6/56) provides a synopsis of his career. For much of his career before 1995 he was involved in work to assess the effectiveness of respirator equipment. He has published extensively on subjects related to asbestos exposure. Since 1995 he has had his own business, Robin Howie Associates. Before 1995 he had some involvement in cases regarding allegations of exposure

to asbestos, but most of his work in that area has been since 1997. He has prepared around 300 reports for courts in cases involving mesothelioma.

[38] It appeared from Mr Howie's report that he had had access to a statement from Mr Watson that was not before the court, and a statement from Mr Brennan, but he confirmed that, having heard Mr McCluskey's account of what Mr Watson had told him, and Mr Brennan's evidence, he saw no reason to alter his opinion. He had not regarded Mr Brennan's evidence as significant in forming his opinion, but had regarded the account deriving from Mr Watson as important. His opinion was predicated on its accuracy.

[39] Mr Howie gave evidence that mesothelioma was related to asbestos exposure in 99% of cases. He had previously been involved in cases involving persons who had worked with boilers. These most frequently involved the repair and demolition of boilers in the place in which those boilers had been installed and had operated. Often they involved strippers coming to strip boilers for demolition, and stripping lagging from them, rather than applying lagging to them.

[40] Asbestos lagging would be applied to boilers and associated components. The type of asbestos used had varied over time. Mr Howie explained that principally blue asbestos (crocidolite) and brown asbestos (amosite) were used. White asbestos (chrysotile) was hydrophilic, so was not used. Crocidolite was used until the mid 1960s, and amosite thereafter. Crocidolite was the most toxic form. The risk of mesothelioma from crocidolite exposure was five times greater than from amosite exposure. Fibre for fibre, the risk from crocidolite was one hundred times greater than that from chrysotile.

[41] Mr Howie had considered published literature in relation to the concentrations of asbestos dust (in fibres/ml) generated by the preparation and use of monkey dung. He had taken a figure of 240 fibres/ml for the preparation of insulation paste, and 30 fibres/ml for its

application. He had considered Harries PG (1971) *Asbestos dust concentrations in shiprepairing: A practical approach to improving asbestos hygiene in naval dockyards*, Annals of Occupational Hygiene, 14; 241-254 ("Harries"); Leathart GL and Sanderson JT (163) *Some observations on asbestos*, Annals of Occupational Hygiene, 6, 65-74 ("Leathart and Sanderson"); and Cross AA et al (1971*) Practical Methods for protection of men working with asbestos materials in shipyards, Safety and Health in shipbuilding and shiprepairing*, pg 93-101, International Labour Organisation, Geneva ("Cross"). Harries had arrived at a figure of 190 fibres/ml mean for the preparation and application of the paste (from a range of 48-377 fibres/ml, and a range of 0.1-61 fibres/ml, in the general atmosphere aboard vessels during refitting. Leathart and Sanderson gave a figure of 280 fibres/ml for the preparation of the paste. Cross cited data indicating that application of pipe lagging containing 15% of asbestos generated 40-60 fibres/ml. Mr Howie's letter included a copy of a photograph (Figure 3) showing a photograph of a worker applying insulation paste. It showed his overalls discoloured with the insulation material. Mr Howie described the preparation and application of insulation paste as a very dirty process.

[42] Leaving aside the application of insulating paste, the process of cutting other asbestos material would still produce dust. Materials such as caposite could come in preformed sections. Cutting and handling freeform sections would generate dust. The exposure level would be somewhere in the region of 30-40 fibres/ml. The asbestos used would always be crocidolite or amosite. Asbestos cloth or rope would probably contain amosite, as crocidolite was more expensive. Amosite rope was widely used wrapped around pipes, and gaskets for boiler doors could well also have been amosite. Amosite was resistant to corrosion from the furnace fumes. Chrysotile might be used if it was at a location distant from the furnace fumes.

[43] Counsel asked Mr Howie whether he was aware of literature showing that asbestos was used in the manufacture of boilers. He was aware of a book dating from 1955 by giving

information about the use of asbestos. It had been published in the United States and might not apply directly to operations in the United Kingdom. This was a booklet entitled: *Steam: its generation and use*, bearing to be produced by The Babcock and Wilcox Company, New York (6/57).

[44] Diagrams on page 14-6 of 6/57 showed the use of asbestos in expansion joints and brickwork. Figure 19 on page 14-16 referred to the use of magnesia block, which was a solid form of insulation containing 15% amosite by weight, and to plastic insulation, which was a further form of asbestos material. Pages 14-15 to 14-16 contained a section dealing with insulating materials. These included: diatomaceous earth base blocks, some of which contained mineral wools and asbestos fibres; magnesia block, containing 15% amosite; high temperature plastic, which was mineral wool fibre, which would have been crocidolite or amosite, and more likely the former, given the date of publication; and asbestos cement. Figure 28 showed the application of plastic insulation over steel mesh. In the 1950s that would have probably contained crocidolite, and by the 1960s more likely amosite. Plastic insulation was a higher performance version of monkey dung.

[45] Asbestos had been useful because it was a very efficient insulation material, resistant to sulphurous fumes and high temperatures, and because it was cheap. When it was formed, and broken and cut, it produced dust. Breathing in asbestos dust had the potential to cause harm. That was recognised in a 1931 publication by Merewether and Price. That work considered exposure in spinning mills making asbestos fabrics, and concluded that the most heavily exposed persons had the highest rates of asbestosis, and developed it at the earliest ages. A relationship between tuberculosis and asbestosis came to be recognised, with one third of deaths from asbestosis occurring in persons with both diagnoses. By the late 1930s the

risk of cancer from asbestos exposure came to the fore, and was addressed by the Factories Inspectorate.

[46] Mr Howie referred to a 1960 paper by Wagner as a bombshell. It linked mesothelioma to asbestos exposure. Some of the cases of mesothelioma studied occurred in persons who did not work in asbestos mines, but lived in nearby townships. He referred to a further paper by Wagner (Wagner JC (1963) *Asbestos dust exposure and malignancy*. XIV International Congress on Occupational Health, Madrid (6/52)). It related that more than half of the cases of mesothelioma studied in the Cape asbestos fields in South Africa had occurred in individuals who had never worked in the asbestos industry, but had lived in the vicinity of the mines and mills. Newhouse and Thompson (Newhouse ML and Thompson H (1965) *Mesothelioma of pleura and peritoneum following exposure to asbestos in the London are*a, British Journal of Industrial Medicine, 22, 261-296 (6/50)) in 1965 produced a paper containing evidence that neighbourhood exposures might be important. The paper contained findings that had been presented at a conference in 1964. Nine of the cases studied were people whose relatives had worked with asbestos. The paper related: "The most usual history was that of the wife who washed her husband's dungarees or work clothes." The authors concluded; "There seems little doubt that the risk of mesothelioma may arise from both occupational and domestic exposures to asbestos." This paper was the first time that environmental exposure had been discussed in a coherent, scientific manner, supported by evidence. It led to an article in the *Sunday Times* on 31 October 1965 by Dr Alfred Byrne, Medical Correspondent (6/42). It contained the following:

> "A disquieting "new" occupational disease capable of killing not only the exposed workman but also perhaps his womenfolk and even people living near his place of work is the subject of intensive behind- the-scenes activity by British scientists, experts on industrial health and representatives of at least to Government ministries.

…

> Of nine patients whose relatives worked with asbestos, seven were women. The most usual history was that of the wife who used to wash her husband's dungarees or work clothes. In one instance a relative said that the husband, a docker, came home 'white with asbestos' every evening for three or four years, during which the wife brushed him down."

[47] Mr Howie was aware that the defenders had a Dr Rose working in their safety department. He would have expected an occupational health doctor to have been aware of publications in the British Journal of Occupational Medicine. The 1960 Wagner paper had been very heavily cited in in that journal, as it had made a link between mesothelioma and asbestos exposure. The journal was the primary journal, in the field of occupational health, at the time in the United Kingdom. By 1960 there were already occupational exposure limits in relation to asbestos, and exposures were to be reduced to the lowest levels practicable, in accordance with the Factories Acts. In order to effect such a reduction, an employer would have to take measurements. If they did not, they would not know whether they were complying with their obligations. It was not common for employers to take measurements, but a number of companies offered commercial services in relation to measuring the levels of dust, noise and other sorts of contamination in factories. Any competent employer could have asked the Factories Inspectorate for guidance. He was familiar with histories of persons seeing dust in the environment. As to the exposure of persons such as the deceased, he referred to page 268 of 6/50, which is a table summarising certain aspects of the authors' research findings. It includes three specified instances of individuals who had washed the clothing of family members.

[48] A simple precaution would have been to have work clothes washed at the work place. At many workplaces, employees changed their clothes at work. It was one that he understood from the evidence that the defenders had eventually taken. The deceased had identified a

particular property at which she was living until 1973. Mr Sweeney left the defenders in 1971. By the time he went back the couple were living at a different address.

[49] The only published reference of which he was aware to the fibres generated by shaking out clothing was that in *Maguire* v *Harland and Wolff plc* [2005] EWCA Civ 01. The experts in that case had agreed a figure of 30-100 fibres/ml. Mr Howie had not himself carried out any experimental work in relation to the matter. He had assumed that the deceased carried out this exercise two or three times each week for between 5 and 15 seconds at a time, and had calculated her cumulative exposure. He had assumed that the dust contained amosite, as the "lesser evil" (compared with crocidolite).

[50] The deceased's exposure up to 1971 materially increased the risk of her contracting mesothelioma. Her exposure between 1965 and 1971 would have increased the risk, at least fortyfold compared with the idiopathic risk of contracting mesothelioma. The idiopathic risk was one per million persons per year. Had Mr Howie been assuming exposure to crocidolite rather than amosite, the risk would have been four or five times higher. Mr Howie initially offered a figure in the region of a 200-400 fold increase in risk of contracting mesothelioma, compared with the idiopathic risk. He was asked about the significance of a period of five to six years (1966 onwards) and in the light of that modified the figure to at least forty, as I understood it to reflect that the idiopathic risk figure he had given was one calculated on a yearly basis, and that the correct idiopathic risk figure over a five year period would be higher than one per million, and would instead be five per million.

[51] The risk from chrysotile would have been much lower. The substance was 100 times less potent. It was less toxic, and it was also difficult to render it airborne, so high concentrations were not usually generated. Mr Howie was asked about the possibility of

exposure to asbestos while working in a garage. He responded that so far as he was aware chrysotile was used in brakes on trains until the 1990s.

[52] He was of the view that the risk from chrysotile in a garage was insignificant compared to the risk from amosite during the 1960s. He also regarded the latent period for mesothelioma as of relevance in assessing the significance of the deceased's work in the garage.

[53] In his letter, Mr Howie had stated that 31 October 1965 was the latest date at which a reasonable employer would have been fully aware of the mesothelioma risk associated with work with asbestos and of the risks from exposure to environmental levels of asbestos – that being the date of the article by Dr Byrne. In his oral evidence, however, he offered the view that so large an employer as the defenders should have been aware from 1960 – that is, the date of the earlier Wagner article – because it indicated a risk to those living in townships associated with mines, and not just those working in asbestos mines. When writing the letter he had not appreciated how large an employer the defenders had been.

[54] In cross-examination counsel suggested to Mr Howie that his use of words such as "bombshell" and "lesser evil" were inappropriate and suggested advocacy, rather than independence, on his part. He responded that both expressions had appeared in the published literature. He regularly received instructions from Thompsons, and wrote between 30 and 50 reports each year. He was asked whether he had produced reports for insurers or defenders. His evidence was that he had produced between 10 and 20 in total, but that he had been told that his reports were unhelpful.

[55] He had been sent a short email, and asked to look at the likely levels of asbestos exposure in this case. He was asked to provide some "early information" as soon as he could. It was effectively to be an early indication of his view. He accepted that he was working from

literature relating to shipbuilding, but said that he needed to work from the literature that was available. Although he had referred in the course of his evidence to information from Cape, which was not produced, he had not used it to consider exposure levels, but to consider the content of various types of materials. In relation to exposure levels, he had considered Harries, Leathart and Sanderson, and Cross.

[56] Mr Howie was referred to 6/48 of process, a document produced in 1967 by the Ministry of Labour and HM Factory Inspectorate, entitled "Problems arising from the use of Asbestos". It was a memorandum of the Senior Medical Inspector's advisory panel. Paragraph 13 reflected the understanding, as at 1967, that the Asbestos Industry Regulations applied only to the asbestos industry itself. Mr Howie accepted that, but explained that that understanding had subsequently been shown to be mistaken. The document (page 10), placed boiler making in the category of involving handling asbestos occasionally. The emphasis had been on the use of asbestos in shipbuilding and shiprepairing.

[57] Under reference to Cross (6/43) and a 1968 article by Harries (6/45) Mr Howie accepted that shipbuilding and ship repairing in the naval dockyards were regarded as the most acutely problematic workplaces. He accepted that a passage in 6/45, at page 136, read:

> "Most of the work carried out in the Royal Yards is refitting and repairing ships, rather than shipbuilding which accounts for most of the work undertaken in the civilian yards. The extent of the refits also differs in that naval refits are usually much more extensive and often involve the removal and replacement of nearly all the insulating material in machinery spaces. As the removal of lagging material gives rise to more dust than its application these are very important differences.
>
> For these reasons, and for the many engineering and constructional differences between naval and merchant ships, I believe that the overall exposure to asbestos is likely to be higher in the Naval dockyards than in their civilian counterparts."

[58] Mr Howie's estimates of exposure were derived from the 1971 Harries article (6/44) and Leathart and Sanderson. In relation to 6/44, he had used the data from page 247,

although he had not specifically relied on it. He accepted that, in general, there was a higher concentration, expressed in mean fibres/cm2 in relation to the breathing zone, as compared with the general atmosphere. The breathing zone was normally within 30cm of the mouth and nose. In the main it was true to say that the further one got form the source of airborne dust, the lower the exposure would be. There were formulae for calculating that diminution if someone was out of doors and there were no intervening air flow movements. In order to employ such a formula, one would need to know about more about the space and the level of exposure.

[59] Counsel asked Mr Howie why there was no reference in his letter to the possibility that Mr Sweeney might have had no exposure to asbestos. Mr Howie responded that this was because, on the basis of the information with which Mr Howie had been provided, it looked as if it was likely that Mr Sweeney had been exposed to asbestos. He had not used the highest figures available to him from the literature. He explained that Harries, at page 246 of 6/44, described levels of exposure for two separate tasks, that of removing asbestos plastic mix from a container, and that of mixing it with water in a bucket. Leathart and Sanderson had referred to a combination of the two activities.

[60] Mr Howie agreed that he had seen no information to suggest that 6/49, which was a letter from the Ministry of Labour and National Service, dated August, 1945, concerning the use of asbestos in shipbuilding and shiprepairing, had been sent to the defenders. He accepted that in heavy industry, such as that operated by the defenders, there tended to be dirty processes unrelated to asbestos. Overalls might be dirty from substances other than asbestos.

[61] He accepted that chrysotile was the form of asbestos most widely used in industry. He explained that that was by a factor of about 10 to 21, both before and after 1976. He

agreed that the diagram of the boiler in 6/57 at page 14-15 looked similar to the type of boiler shown at page 16 of 7/7, and discussed in Mr Brennan's evidence. He accepted that there was no explicit reference to the presence of asbestos in the discussions of mineral wool or plastic insulation in 6/54.

[62] The body of knowledge regarding asbestos had been developing in the 1960s and 1970s. The purpose 6/48 had been to look outside the asbestos industry itself as to where else risks might exist. Table 4 in that document reflected the various industries considered by the advisory panel. The panel (paragraph 12) extrapolated a figure of 20,000 thought to be using or manipulating asbestos outside the asbestos industry, but that did not include those exposed by reason of working near where asbestos was manipulated. Paragraph 37 read:

> "It seems important to us that the problem of mesothelioma in association with asbestos exposure or asbestosis should however be kept in proper perspective. The great public interest being taken in these tumours at this time may otherwise readily develop into a stage in which their importance as a hazard even to asbestos workers may become, in a relative sense, exaggerated.
>
> Much has been written about the mesothelioma problem as it affects the public at large either from accidental exposure to asbestos dust produced by others or even through residence in the neighbourhood of an asbestos factory. We do not at the present time know the precise incidence of mesothelioma in the population generally. The total of mesothelioma cases collected over a period of many years in Great Britain is around 200, most of which have been diagnosed in the last fifteen years. The incidence is certainly rising but even so, the total must be viewed against a total of 21,476 deaths in males and 3,895 deaths in females in 1964 alone from cancer of the trachea, bronchus and lung. In the last six months 17 cases of mesothelioma have been reported to the PRU, but these figures are known to be an underestimate for the country."

Mr Howie accepted that the authors were trying to put the thread from mesothelioma into perspective. He was referred to a further passage in the same document, at paragraphs 55 and 56:

> "55. So far as asbestosis (and hence asbestos related bronchial carcinoma) is concerned, we believe that it is possible by the application of the best current engineering practice to create an environment in which the chances of developing asbestosis of a compensatable degree are small. Even here, the question arises as to what is meant by 'compensatable asbestosis' as X-ray films fall on a spectrum at one end of which are the gross changes characteristic of frank asbestosis and at the other end, changes which, although due to asbestosis, are slight. Much more research in the standard of diagnosis is required.
>
> 56. In the light of present knowledge, we must record our opinion that where asbestos, particularly crocidolite is used, some risk of mesothelioma will have to be accepted. At this time we do not know the level of exposure below which the risk may be negligible. It seems quite possible that those mesotheliomas which appear to be related to environmental and home exposures were in people who had quite an appreciable dose of asbestos. There is also some evidence, relating to past occupational exposures which supports the view that, if occupational exposures are reduced to the levels indicated in the above paragraph, the risk of developing mesothelioma is greatly reduced. The latent period between first exposure to asbestos and the development of mesothelioma is very long, in some cases up to 30-40 years or more. Cases in South Africa have occurred at a relatively young age apparently following exposure in childhood. Some advantage might be gained in restricting industrial exposure to asbestos to persons over 40 years of age or even older. We recommend that the practicability of doing this should be discussed in different branches of industry."

Mr Howie accepted that this reflected thinking in 1967 that there were measures that could be taken to reduce exposure, and at that time there was no blanket ban on import or use of asbestos suggested.

[63] In relation to the earlier period, and in particular to 1960, counsel asked Mr Howie about 7/10, a document entitled "Toxic Substances in Factory Atmospheres", produced in March 1960 by the Ministry of Labour and the Central Office of Information. Under reference to the content of the introduction, counsel suggested to Mr Howie that in 1960 there were not readily accessible methods of measuring asbestos in the air. Mr Howie disagreed with that proposition, saying that methods had been available from the 1920s and 30s at the time of Merewether's work; the Sanderson publication from 1963 contained measurements. He referred to the use of a thermal precipitator, widely used in coal mines.

He accepted that it might not have been widely deployed in factories in 1960. That did not, however, mean that there were no duties to control exposure to materials in factories at that time. The document provided a permissible concentration (in PPCC – particles per cubic centimetre of air). The figure for asbestos was 177. That equated to 5 fibres/ml. Mr Howie said that it was not the case that 177 PPCC was the point at which an employer should take action to control dust; it was the point at which further action was necessary to control dust.

[64] Asked about 6/50, he accepted that the relatives of the nine patients referred to would have been workers who would have been heavily exposed to asbestos, even by the standards of the day.

[65] Counsel referred Mr Howie to 7/11, issued by the Department of Employment and Productivity, entitled "Standards for Asbestos dust concentration for use with the Asbestos Regulations 1969 – Technical Data Note 13". It provided guidance as to 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 the health of employed persons". It had come about because of the promulgation of the Asbestos Regulations 1969. It was produced in 1970. Mr Howie agreed that it had come about because of the concerns raised by Newhouse and Thompson. Where chrysotile and amosite were concerned, no action would be taken where the average concentration of asbestos dust over any 10 minute sampling period was less than 2 fibres/ml. Where over a period of 4 hours the average concentration was 2 fibres/ml or more, the extent to which HM Factory Inspectorate would require the standard of control to be improved would depend on the amount by which it exceeded that figure, and the duration of exposure. When the concentration was greater than 12 fibres/ml over a 10 minute period, a further sample would be taken before action to enforce regulation 7 or 8 of the 1969 regulations.

[66] The regulations were said to apply in full wherever workers were engaged in processes involving crocidolite. An approved respirator would require to be worn unless the concentration in the breathing zone of the worker could be maintained below 0.2 fibres/ml. Although an employer might not be breaching a regulation by failing to take samples himself, Mr Howie commented that the numbers given in the document depended on observations taken by sampling. An employer who did not take samples could not assume that the conditions in his premises complied with the standards in the documents. A sensible employer would want to make sure that he was not creating a risk, and was complying with the regulations in the way that they were understood by the Inspectors of Factories.

[67] Mr Howie accepted, under reference to plans of the defenders' premises that they had operated a very large industrial site. Mr Brennan had worked in a number of different buildings on either side or railway lines that cut through the middle of the site. Even in the context of a building five or six times the size of Parliament Hall, it was in his view unlikely that Mr Sweeney would have had no exposure to asbestos unless he worked upwind of the relevant process at all times. He would assume that he sometimes worked upwind and sometimes downwind. He was not making a conjecture, but trying to apply the data he had.

[68] Mr Howie was then asked about the deceased's employment records from the Department of Work and Pensions (7/1). Mr Di Rollo took objection to this line of questioning. I allowed the evidence to be led subject to competency and relevancy. The production bore to be a form signed by the deceased in which she stated that she used to work in a car show room with a garage, that she believed asbestos materials were used in the building itself; that she remembered lots of dust in the parts department; that her husband worked with asbestos, but that she believed she was exposed in her own right. He

said that there might have been asbestos in brake linings. That would have been chrysotile. He would have discarded late exposure to chrysotile in the context of information about exposure to asbestos on her husband's clothing, and the latency period of mesothelioma.

Dr Peter Semple

[69] Dr Semple is a retired general physician, with a particular interest in lung disease. He worked in Inverclyde Royal Hospital between 1979 and 2008. He prepared a report, 6/30, in the present case. There was no dispute that the deceased died of malignant pleural mesothelioma. In his opinion a history of brief or low level exposure should be considered sufficient for mesothelioma to be designated as occupationally related. He had encountered several similar cases in which a wife had been exposed to asbestos and had gone on to develop mesothelioma. He had examined his own case records. He had considered 604 records, 37 of which related to women. Of those 37, 26 had been occupationally related, and 11 women had been exposed by way of cleaning her husband's overalls. As I understood his evidence, one of these cases had been connected to employment with the defenders.

[70] He had been aware that the deceased worked in a garage from 1979 until the mid 1980s. In garages one recognised means of exposure was removing and replacing Ferodo brake pads. He had presumed she had not worked as a mechanic herself. He had never seen brake pads removed, but he understood that the material was often friable when removed, and that sometimes it had to be filed, or a hole bored in it, for fitting. Those circumstances caused there to be dust in the atmosphere. He had not seen secondary exposure from brake pads. The fitting and removal of brake pads would be less likely to affect anything other than their immediate environment. Persons fitting or manufacturing

boilers would be followed closely by laggers mixing monkey dung, and causing a lot of dust in the atmosphere. As he understood it, in the assembly of boilers fitters and laggers would work alongside each other. The scenario suggested in this case, of the deceased's being exposed to asbestos from Mr Sweeney's clothes, did not surprise him at all.

[71] Dr Semple was referred in the course of his evidence to histories recorded in the medical records of the deceased (6/31) as apparently having been given by her. A letter from a consultant respiratory physician to a consultant in clinical oncology dated 1 June 2015 (page 234) related: "She never smoked. Her late husband was an engineer fixing boilers and she washed his clothes." Similar references to Mr Sweeney's work appeared at pages 56 and 134 of 6/32, further medical records.

Submissions for pursuers

[72] Mr Di Rollo renewed his objection to reference to material in 7/1 and 7/2 of process, relating to applications made to the DWP. These had not been proved.

[73] He turned to matters which were not in dispute, namely the employment histories of both the deceased and Mr Sweeney.

[74] The pursuers' position was that the end point of the deceased's exposure was 1971. That was when Mr Sweeney's employment with the defenders ended for the time being. On the deceased's account, overalls were still being brought home at that time.

[75] As to whether and to what extent Mr Sweeney was exposed to asbestos fibres while in employment with the defenders, Mr Di Rollo relied on the content of the deceased's statement supported by the brief accounts recorded in her medical records of the histories she had given to those treating her; the evidence of Mr McCluskey as to what Mr Watson told him; and the evidence of Mr Brennan. Mr Howie had also given evidence as to the

materials he would have expected to be involved in the boilermaking process. That supported the information in the evidence deriving from Mr Watson and in Mr Brennan's evidence. The evidence given about the use of asbestos in the construction of boilers had not been seriously challenged, and had not been contradicted by any other evidence. I could be satisfied on the evidence that Mr Sweeney worked in the same area as laggers and that the processes they engaged in generated substantial quantities of dust.

[76] It was unrealistic to think that there could ever be a scientifically accurate way of assessing and presenting to the court the levels of dust actually generated. What the court required to consider was whether the work would produce significant quantities of dust. The evidence presented a description of asbestos materials being used consistently throughout the period of Mr Sweeney's employment. There was no reason to think that the manufacturing process changed or that different materials were used. The content of 6/57 tended to support the proposition that asbestos was used in the manufacture of boilers generally. The type of asbestos used would have been amosite or crocidolite, having regard to Mr Howie's evidence.

[77] In support of the submission that it was necessary for the court to take a practical approach to the questions before it cases of historical industrial disease, Mr Di Rollo referred to *Harris* v *BRB (Residuary) Ltd and Another* [2005] ICR 1680.

[78] *Harris* was a successful appeal against the dismissal of a claim for noise-induced deafness, in which the alleged exposure was between 1974 and 1999. In the course of the appeal the defendant attacked the basis on which the first instance judge had made findings about the level of the claimant's exposure to noise. The judge had noted that exposure to sound above a particular level every day through a working life would involve a particular measurable risk, whereas exposure on just a few days of that working life would not. He

had not been referred, in that context, to where the "risk-line" should be drawn (paragraph 17). He had therefore formulated the question for the court in broad terms, namely whether the claimant had been regularly, and over a significant period, been exposed to noise at a level of 85 dB(A) leq or more (paragraph 16). The Court of Appeal determined, at paragraph 19, that the first instance judge had been entitled approach the matter in the way that he did, and to reach the conclusions he did:

> "19.The principal ground of attack was on the propriety of the Judge's approach to the issue he was considering. In that connection, the Judge's formulation of the vital question which he had to determine was whether the claimant had 'regularly' and 'for a significant period' been exposed to sound levels of 85dB(A)leq or above. As he explained, the difficulty he faced on the evidence was the absence of any evidence as to a 'risk-line'. It has not been suggested that his formulation was wrong in law, or even could be improved on. The only alternative, therefore, would have been for the Judge to reject the claim simply on the basis that he had not been provided with a risk-line. I do not think that would have been the appropriate course to take. Claims for personal injury arising out of exposure to noise, vibration, or other health risks, particularly where the exposure was over a long period of time in different circumstances, notoriously give rise to difficulties. While it may be dangerous to generalise, the cases demonstrate, and common sense and fairness require, that, unless it is clear that decisive evidence would have been relatively easily available, and that there was no good reason why it is not before the court, it is normally wrong for the court simply to shelter behind the burden of proof and dismiss the claim."

[79] Mr Di Rollo submitted that the court had to do its best with the material before it. The court could be satisfied on the balance of probabilities that significant quantities of dust containing asbestos were generated during the period of Mr Sweeney's employment and that as a result of his proximity to the dust, it would have got on to his clothing. The estimates of exposure provided by Mr Howie were of assistance, but they were not really necessary. Even had there been no evidence of the sort he provided, and the only evidence was that asbestos was used to a significant extent, the court would have to consider and assess that evidence and take a view as to whether or not a reasonable employer would have taken precautions. Where asbestos dust was generated in a significant quantity and it was

reasonably foreseeable that that would cause harm, a reasonable employer exercising reasonable care would not disregard the risk, but take precautions. Had the defenders applied their mind, they would have taken precautions to protect someone in the position of the deceased.

[80] The court was entitled to take into account the evidence given by Mr McCuskey. Hearsay evidence was admissible. The deceased's evidence was of limited assistance because she was not able to say that she had been told much about the conditions in the defenders' premises. Mr Watson's evidence was important, and the pursuers relied on it as evidence of the processes that were being carried on. In the absence of contrary evidence there was no reason not to accord it weight.

[81] There had been an objection to part of Mr Brennan's evidence, but the record covered processes of the types described by him. The pleadings were concerned with the use of insulation materials in boiler making, and any respect in which they were manipulated in order to fix them to the boilers was properly the subject of notice in them.

[82] Mr Di Rollo referred to the statutory duties incumbent on the defenders towards Mr Sweeney under the Factories Acts of 1937 and 1961; had the defenders complied with those duties then the deceased would not have been injured as she was. He accepted, however, that he could not rely on the statutory duties to Mr Sweeney. The case relating to the deceased was a common law case. That there were statutory duties to Mr Sweeney, however, put the question of precautions into context. The evidence was that there were no precautions at all. Mr Brennan's evidence was that he was not warned about the use of asbestos, and if he had not received a warning, that would indicate that Mr Sweeney had not. In this case there was an obvious reasonable precaution, namely that the employee

changed at the factory gate, with the clothing used for work kept within the factory. It was a common sense precaution, and one that was easy to take.

[83] The court could disregard the only potential source of direct exposure in the deceased's own employment history. There was no evidence that she had been exposed, and even if she had been, the exposure would have been far less likely to cause mesothelioma, as the exposure would have been to chrysotile. The timing of the employment also told against any exposure in that context as the cause of mesothelioma in the deceased. The only known source of asbestos exposure was from Mr Sweeney's clothing.

[84] Mr Di Rollo referred to *MacDonald* v *National Grid Electricity Transmission plc* [2015] AC 1128. The case concerned the application of the Asbestos Industry Regulations 1931 and the Factories Act 1937 where the claimant developed mesothelioma and his only known exposure to asbestos was between 1954 and 1959 when he had driven a lorry to a power station. In the course of his visits he would visit parts of the premises where lagging was taking place. The Supreme Court determined that the 1931 regulations did not apply merely to the asbestos industry, but also to any factory, workshop or part thereof where any of a wide range of processes referred to in the preamble, including mixing asbestos, was carried on. The duty under section 47 of the Factories Act 1937 to take practicable measures to protect persons employed against inhalation of dust arose whenever a considerable quantity of dust was given off in connection with a process carried on, and it was not necessary to show that the quantity was considerable at the point of inhalation. Mr Di Rollo submitted that the point to be taken was that dust was not good in a general sense, and that steps were to be taken to reduce it to a minimum and prevent its accumulation. Section 47 applied to

substantial quantities of dust of any kind. The discussion in *McDonald* provided a context for consideration of the common law duties owed to the deceased.

[85] The most recent and most analogous authority was *Maguire*. Morland J had accepted that during a period between 1961 and 1965 the risk of injury to the deceased, the wife of a boilermaker employed in the defendants' shipyard, was reasonably foreseeable and indeed obvious." The majority of the Court of Appeal, Mance LJ dissenting, decided that Morland J had not been entitled to reach that conclusion on the evidence. Mr Di Rollo submitted that his case did not depend on the proposition that the defenders knew or should have known of the risk before 1965, because Mr Howie's evidence established that there was a materially increased risk of injury by reason of exposure from 1965 onwards. In seeking to support an earlier date, Mr Di Rollo relied on Mr Howie's evidence. He submitted that asbestos was known to be dangerous well before 1960. The dust was known to be likely to cause a difficulty to anyone who came into contact with it. Information about the danger from mesothelioma was available by the beginning of the 1960s, and it was known that it would not require much contact to give rise to the risk of that very grave disease.

[86] Mr Di Rollo referred extensively to Mance LJ's dissenting judgment. Mance LJ had taken a legitimate approach and it would be open to me to take a similar approach on the evidence available in the present case. In any event, having regard to the 1965 Newhouse and Thomson article, it could not be suggested that a reasonable employer would not foresee the risk that a person in the deceased's position would contract a fatal condition any later than 1965.

[87] *Rice* v *Secretary of State for Business Enterprise and Regulatory Reform* [2008] EWHC 3216 (QB) was instructive as to the approach taken to information about the risks of contact with asbestos dust in 1960 and in 1966 (paragraphs 64-86). *Baxter* v *Harland and Wolff* [1990]

IRLR 516, a decision of the Northern Ireland Court of Appeal, emphasised that an employer was under a duty to concern himself with matters of safety and to keep abreast with contemporary knowledge in the field of accident prevention: paragraphs 4, 34.

Submissions for defenders

[88] Mr Mackenzie sought absolvitor. He submitted that the pursuers had not proved their case. The evidence demonstrated no more than a possibility that Mr Sweeney had worked with or near asbestos, and that he had brought asbestos home with him as a result. The evidence was so poor in quality that the court was being invited to speculate as to where in the factory he worked; as to the likely level of any exposure to asbestos; how often he worked with or near asbestos; and whether he had been exposed to asbestos after 1965. It was likely that his clothes were dirty simply because he worked in heavy industry.

[89] He did not maintain any objection to the admissibility of Mr McCluskey's evidence about what the deceased and Mr Watson told him, but submitted that the authorities which prohibited the admission of precognitions were relevant to the way in which I should approach that evidence. He referred to *F v Kennedy (No 2)* 1994 SLT 1284, at 1288; *Young* v *National Coal Board* 1960 SC 6, at 9; *Anderson* v *Jas B Fraser & Co Ltd* 1992 SL7 1129, at 1130; and *Cavanagh* v *BP Chemicals* 1995 SLT 1287.

[90] From these authorities the following propositions emerged. Care required to be taken where statements were tainted with self-interest; where they had been elicited by means of questions being put, particularly where there was no record of what questions had been put; and where there were grounds for suspicion that the witness had been induced to state the facts in the way most favourable to the person calling him.

[91] Mr Watson was contacted on the advice of the deceased and the first pursuer. He knew Mr Sweeney and he wanted to help. Mr Brennan was a client of Thompsons. He had an interest in giving evidence to assist the pursuers as it might assist his own position. Mr Brennan's evidence was of little relevance in the case in any event, because he did not work with Mr Sweeney at any time.

[92] Mr McCluskey's notes of conversation with Mr Watson lacked detail. The conversation had lasted only 15 minutes. The defenders' organisation was a very complex one involving very many different activities, something not explored with Mr Watson. It was not clear whether Mr Watson had been talking about his time as an apprentice or the period with which the action was concerned.

[93] Mr Mackenzie did not suggest that Mr Brennan was not credible, or was consciously fabricating evidence. Rather, he submitted that the process of being involved in litigation had caused him unconsciously to exaggerate. He had carried out his own investigations online. The effort of reconstructing experiences tainted the memory of the witness. Mr Mackenzie referred to *Prescott* v *University of St Andrews* [2016] CSOH 3. He did not refer to any particular passage, but I understood him to have in mind Lord Pentland's consideration of the pursuer's evidence at paragraph 42.

[94] When contemporaneous evidence (which I took to be a reference to the plans and other documents put to Mr Brennan) was put to him, he was straightforward and was reasonably able to point to the places where he had worked. I should accept as reasonably accurate what he said about the size and scale of various buildings, and what went on in them. Mr Mackenzie was not in a position to suggest that there was no asbestos in the factory, but he submitted that there was a real risk that Mr Brennan might have exaggerated.

[95] Mr Howie was partisan, and should not be regarded as an independent expert. Mr Mackenzie referred to the volume of reports he prepared for pursuers. He was not a witness to fact, and could not speak to conditions in the defenders' factory at the relevant time. It was not appropriate that he should adopt results from a decided case and present that as expert evidence.

[96] Dr Semple had not been cross-examined, but his evidence did not advance matters so far as the pursuers were concerned. He had volunteered the view that, in relation to boilers, exposure in his experience tended to be in the removal and application of lagging on site.

[97] So far as the state of knowledge of the defenders regarding risk to persons such as the pursuer was concerned, Mr Mackenzie submitted that there was a philosophical difference between the approach of the majority and the minority in *Maguire*. What underpinned the reasoning of the majority was the notion that until dangers are known about, employers are not under any obligation proactively to "plough", as he put it, to discover them. They did not require to do any more than would a reasonably prudent man exercising caution in his own affairs. That was the starting point. He referred in passing to *Jeromson* v *Shell Tankers (UK) Ltd* [2001] ICR 1223 (sometimes referred to as *The Cherry Tree*), referred to in the reasoning of Judge LJ. Nobody, he said, knew that what would now be regarded as a horrifying level of exposure was significant. The toleration of 5 fibres/ml in 1960 (7/10) would now be seen as intolerably high. Even by 1970 the approach of the Factories Inspectorate (7/11) was to tolerate certain levels. The common law did not recognise what he described as a modern, zero-tolerance, approach to risk.

[98] By the time of the *Sunday Times* article an employer started to be "on notice" if carrying out work of the types mentioned in the "relevant history" column in Section C:

exposure of relatives, in the appendix to the Newhouse and Thomson article (6/50); that is, if the employer's business gave rise to "heavy exposure" to asbestos.

[99] Mr Mackenzie commended the reasoning as expressed by Judge LJ at paragraphs 57 and 58:

> "57. As Morland J found, until 1965, notwithstanding the increasing concerns and developing knowledge about the risks of exposure to asbestos among employees, nothing in the literature warned against the risks of familial or secondary exposure. On this topic, there was what appears to us now to have been a numbing silence. Before 1965 neither the industry generally, nor those responsible for safety and health, nor the Factory Inspectorate, nor the medical profession, suggested that it was necessary, or even that it would be prudent, for risks arising from familial exposure to be addressed by the industry. In truth, the alarm did not sound until late 1965, when it began to be appreciated that there could be no safe or permissible level of exposure, direct or indirect, to asbestos dust. Thereafter, the learning curve about the risks arising from familial exposure was fairly steep. In my judgment, however, Morland J's conclusion that the risk of serious injury to Mrs Maguire's health was "reasonably foreseeable, indeed obvious" to her husband's employers is not sustainable.
>
> 58. The issue remains whether Mrs Maguire has established that Harland & Wolff were negligently in breach of the duty owed to her as the wife of an employee working with and contaminated by asbestos dust. If so, liability would arise on the somewhat unusual basis that they failed to address a risk which had not yet been identified or addressed by anyone else, whether within or outside the industry. In the absence of any evidence from any source whatever of contemporaneous insight into familial risk, or any contemporaneous suggestion that the possibility of such risks should be addressed, I am unable to accept that by not later than 1960, and ahead of contemporary understanding, Harland & Wolff should have appreciated that Mrs Maguire was at risk of pulmonary or other asbestos-related injury, and that their failure to do so and to take appropriate precautions for her safety was negligent."

[100] By contrast, Mance LJ's approach was predicated on the notion that absent identification of the risk in the literature, an employer should have deduced for himself that the risk existed, and acted to reduce it. He referred to paragraph 78:

> "78. This brings me to the appellants' straightforward submission that they were not in breach of any duty towards Mrs Maguire, since it was not reasonably foreseeable that their failure to take proper precautions would injure anyone except Mr Maguire. For this submission to be good, it has to be possible to conclude (in Lord Reid's words) that it was not "reasonably foreseeable as liable to happen even in the

> most unusual case" that Mrs Maguire, as a wife coming into contact with asbestos at home, would incur any injury as a result of such contact. This is the submission that Judge LJ and Longmore LJ would accept. They would accept it on the basis that no-one had identified any such domestic or secondary risk in the literature, or so far as appears elsewhere, before 1965. This is so, although, as Mr Allan QC conceded, many employees had over the years often been unjustifiably exposed to asbestos dust by their employers. However, whether anyone actually foresaw, or recorded that they foresaw, the possibility of any general risk of this nature is not necessarily the same question as whether a particular employer ought in particular circumstances reasonably to have foreseen such a risk to the wives of its employees. Negligence and reasonable foreseeability are always fact specific, and the factual features of the present case are in my view critical. Here, we are concerned with a specific company which was in serious breach of its duty of care to Mr Maguire in respects which can be shown specifically to have increased the amount of such dust that he carried out of the factory to his home, and where it was obvious that his wife would at home be likely to be cleaning and handling his clothes."

[101] Counsel submitted that insofar as Mr Di Rollo had, by reference to Mance LJ's judgment, sought to rely on the content of a 1959 report by the Chief Inspector of Factories, I should have no regard to that, as the report was not produced and not been the subject of evidence.

[102] Mr Mackenzie referred, further, to *Williams* v *University of Birmingham* [2012] PIQR P4, at paragraphs 31-38 and 44. He relied in particular on paragraph 44in the judgment of Aikens LJ:

> "I accept, of course, that a judge must determine the degree of exposure to asbestos fibres to which Mr Williams was actually subjected and whether that was a de minimis exposure or a material exposure. If it was a de minimis exposure then there could be no question of a breach of duty, as the judge recognised. But, assuming that the exposure was more than de minimis, it was, in my view, necessary to ask a further question. That is whether, given the degree of actual exposure, it ought to have been reasonably foreseeable to the University (with the knowledge a reasonable University should have had in 1974) that, as a result, Mr Williams would be likely to be exposed to the risk of personal injury in the form of contracting mesothelioma. To determine that question, it seems to me the judge had to make findings about (1) the actual level of exposure to asbestos fibres to which Mr Williams was exposed; (2) what knowledge the University ought to have had in 1974 about the risks posed by that degree of exposure to asbestos fibres; (3) whether, with that knowledge, it was (or should have been) reasonably foreseeable to the University that, with that level of exposure, Mr Williams was likely to be exposed to asbestos related injury; (4) the reasonable steps that the University ought to have taken in the light of the exposure

> to asbestos fibres to which Mr Williams was exposed in fact; and (5) whether the University negligently failed to take the necessary reasonable steps."

[103] Counsel emphasised the need for courts to avoid any relaxation of the normal requirements of evidence and proof under reference to a passage in *Sienkiewicz* v *Greif (UK) Ltd* [2011] 2 AC 229 (Lord Rodger of Earlsferry at paragraph 166):

> "It is important that judges should bear in mind that the Fairchild exception itself represents what the House of Lords considered to be the proper balance between the interests of claimants and defendants in these cases. Especially having regard to the harrowing nature of the illness, judges, both at first instance and on appeal, must resist any temptation to give the claimant's case an additional boost by taking a lax approach to the proof of the essential elements. That could only result in the balance struck by the Fairchild exception being distorted"

He referred also to *Wardlaw* v *Bonnington Castings* 1956 SC (HL) 26: Lord Reid at 31.

[104] Mr Mackenzie maintained an objection to Mr Brennan's evidence about the cutting of preformed sections of asbestos. There was no notice of that line of evidence on record.

Decision

Observations

[105] This is, so far as I can tell, the first case in this jurisdiction in which a proof has taken place dealing with secondary exposure, that is, exposure to someone in the home of an employee, alleged to have caused mesothelioma in a secondary victim. In that context it is surprising to find the pursuers' expert witness being instructed less than two weeks before the proof, and well after any report by him should have been lodged. The range of publications made available to the court in England in *Maguire* was not before me. The 1959 report was not put in evidence. Mr Howie did not mention it in his letter, and was not asked about it. I heard reference to it for the first time in submissions through the medium of Mance LJ's dissenting judgment in *Maguire*. Mance LJ's reasoning was commended to

me, but without the provision to me of some of the material on which he relied. Mr Howie, again, surprisingly, changed his position from that expressed in his letter in the manner I have already described. The 1960 article on which he placed reliance was not before the court.

[106] There was considerable discussion in *Maguire* of the date at which it would have been reasonably foreseeable to an employer – in that case a shipbuilder – that there was a risk of injury to secondary victims. That discussion, however, was in the context of a first instance decision that the risk was reasonably to have been foreseen before 1965. The majority of the Court of Appeal rejected that conclusion. It did not involve any positive finding as to when the risk should reasonably have become foreseeable. Another case involving secondary exposure before 1965, *Gunn* v *Wallsend Slipway & Engineering Co Ltd*, (unreported, 7 November 1988) appears to have failed for reasons similar to those given by the majority in *Maguire*: *Maguire*, paragraph 55. Again, so far as I can tell, there has not been a case in this jurisdiction making any positive finding as to when any employer should have become aware of the risk of injury to secondary victims, far less one dealing specifically with an employer such as the defenders, engaged in boilermaking. I was not referred to any case in which there has been a positive finding of that sort. Further, at least part of the pursuers' submissions were directed at persuading me to adopt the position of the minority in *Maguire*.

[107] I would have expected against that background the instruction of an expert witness, with a particular view to presenting the relevant literature to the court, to be a matter of priority. On Mr Howie's own account, he received papers on 13 October 2017. He was not instructed until after the pre-trial meeting of 2 October 2017. The pre-trial meeting did not involve senior counsel or the solicitor advocate who conducted the proof for the pursuer.

Mr Howie received a short email and was asked to provide "early information" as soon as he could. That seems little short of astonishing in the context I have just narrated, and where I was told he had been on the list of witnesses "throughout".

[108] In cases where industrial exposure took place a long time ago, there will sometimes inevitably be difficulties of proof. These are more acute in a case of this sort, because the most significant evidence is not that of the person who has allegedly been injured, but that of the employee, who would be in a position to describe the working conditions. Where the employee is the injured person, it will no doubt be obvious that evidence should be recorded on commission at an early stage. I do not know whether anything much would have been gained by recording the deceased's evidence in that way. She died only a short time after meeting with Mr McCluskey. The employee in this case, however, died several years before the deceased became ill, and for reasons not apparently connected with exposure to asbestos. There can be no criticism levelled at anyone for the absence of his evidence.

[109] Mr Watson, so far as I am aware, was the only witness identified as someone who might be able to speak to the circumstances of Mr Sweeney's employment and his exposure to asbestos. I was not told when he died, or when the pursuers' agents became aware that he had died. There may have been no reason to suspect that he would die before the proof, prompting steps to preserve his evidence by taking evidence on commission.

[110] A very precise picture of the duties of an employee cannot reasonably be anticipated or expected in most cases involving exposure said to have started more than fifty years ago and ended forty seven years ago. Even taking a more detailed statement, however, might have provided an opportunity to gather evidence about frequency and duration of the operations, the nature of the operations, and the exposure of Mr Sweeney in particular. In cases involving witnesses already relatively elderly, perhaps particularly where exposure to

a potentially fatal contaminant is alleged, there might be some merit in the early preparation of detailed affidavits, if not early consideration of taking evidence on commission. Mr Watson was 78 years old when Mr McCluskey spoke to him. Life expectancies nowadays are greater than in the nineteenth century, when the attainment by a witness of 70 years of age might have prompted steps to take evidence to lie *in retentis* (see *Commission and Diligence,* MacSporran and Young, paragraph 9.45).

[111] I was not told of any attempt to ask the court to exercise its powers under section 1(1A)(a) of the Administration of Justice (Scotland) Act 1972. There are no motions for commission and diligence at the instance of the pursuers within the process. It may be that there were investigations in the background to which I am not privy that caused the pursuers' agents to think that asking the court to exercise its powers to find potential witnesses, or to recover documents bearing on the conditions of employment would be futile. I do not know, and it would therefore be inappropriate to be critical in relation to those matters. But the condition in which the case came before the court, and in particular the instruction of the expert witness only after the pre-trial meeting, suggest that the necessity to prove the pursuers' case only became properly focused for the pursuers' agents at a very late stage.

[112] Given what is now a long history of asbestos litigations, there should be very considerable numbers of actions where there is no real dispute as to the likelihood of exposure in a particular environment, and/or no real dispute as to resulting liability. Not every case involving asbestos falls into that category. Prescott is an example. Parties should be alert to identify cases which are likely to involve real dispute either as to exposure, liability or both. That involves cooperation and candour on the part of those representing

insurers. It would be unfortunate if disproportionate resources came to be expended in the investigation and preparation of cases where there should be no real dispute.

Undisputed matters

[113] There is no dispute that Mr Sweeney was employed by the defenders between 1962 and 1971, or that the deceased died because she contracted mesothelioma.

Was the deceased exposed to asbestos in the course of her own employment?

[114] I am not satisfied that the deceased was exposed to asbestos in the course of her own employment, or that, if she was, she contracted mesothelioma as a result. There is no dispute that she worked in the garages already referred to. Objection was taken, rightly, to the evidence about the content of the DWP records. Those records were not the subject of agreement and their authenticity was not established in any way in the course of the evidence. I therefore leave them out of account. That the deceased was exposed to asbestos while working at the garage is nothing more than speculation. The possible mechanism of exposure that occurred to both Mr Howie and Dr Semple in the context of a garage was in the removal and fitting of brake pads, tasks that would be carried out by mechanics. The substance involved in that process was chrysotile, which is considerably less toxic than either amosite or crocidolite. Had the substance been emitted, it would not have spread far. It was difficult to render it airborne. Had I taken into account the content of the DWP records, I would have regarded them as reflecting speculation on the part of the deceased. I am satisfied by the evidence of Dr Semple that exposure to chrysotile between in the course of the deceased's employment in garages from 1979 is not likely to have caused the deceased to develop mesothelioma.

When was risk of injury reasonably foreseeable to the defenders?

[115] I consider next when the defenders became subject to a duty of care to the deceased by reason of their knowledge of a risk of secondary exposure affecting persons living with employees exposed to asbestos at work. In his letter, Mr Howie identified 31 October 1965, the date of Dr Byrne's article in the *Sunday Times*, as the latest date at which a reasonable employer would have been fully aware of the mesothelioma risk associated with work with asbestos and of the risks from environment levels of asbestos. He wrote that such appreciation would have been reinforced by the Ministry of Labour's 1967 Memorandum (6/48).

[116] In his oral evidence, Mr Howie altered his position, and offered an opinion that relevant date was 1960. He said he had not appreciated how large an employer the defenders had been. I find that difficult to understand, as his letter contains the following passage:

> "It is also considered that as major employer [*sic*] Babcock and Wilcox Ltd, whose Renfrew establishment was described by Oakley (1953) as being 'the largest boilermaking works in the world' would have had the resources to be fully up to date with all contemporary legislation, regulations and guidance."

[117] The Wagner paper from 1960, referred to by Mr Howie in the course of his oral evidence was not produced. That is surprising and unsatisfactory, given the emphasis that came to be placed on it in Mr Howie's oral evidence. I was not shown any of its content. I understand the 1960 paper to be Wagner JC, Sleggs CA and Marchand P (1960) *Diffuse pleural mesothelioma and asbestos exposure in the North Western Cape Province*, British Journal of Industrial Medicine 17, 260-271, which is cited in other papers which were lodged in process and in *Maguire*. It does not seem to me that I could properly draw the significant conclusion

that the pursuers ask me to on the basis of a paper that was not part of the evidence in the proof. On the basis of what Mr Howie said about its content, and the references to it that I saw in the literature that was produced, it appears that it was a significant paper both in associating mesothelioma with exposure to crocidolite and in mentioning some incidence of disease in persons not working directly with asbestos, but living near to mines.

[118] Mr Howie himself acknowledged, however, that the 1965 paper represented a significant development in its reliance on evidence presented systematically and scientifically. Its content became more widely disseminated by virtue of Dr Byrne's reference to it in the *Sunday Times*. It was the paper which had precipitated the preparation of the government publication 6/48 of process. That publication begins with a letter from the Chief Inspector of Factories to the Minister of Labour, in the following terms:

> "The health problems associated with occupational exposure to asbestos dust have long been of considerable concern to HM Factory Inspectorate. Awareness of these health risks has become much more widespread over the last two or three years and public interest was particularly stimulated by the publication in the October 1965 issue of the British Journal of Industrial Medicine of an article by Dr Newhouse and Dr Thomson about the association between exposure to asbestos and mesothelioma of the pleura and peritoneum."

[119] Mr Di Rollo relied heavily on Mance LJ's dissenting judgment in *Maguire*. Mance LJ placed considerable weight on the 1959 report. That report was not before me. It was not introduced into evidence. Mr Howie was not asked in evidence in chief about its significance, and was therefore not cross-examined about it. There was no evidence that a properly diligent director of a large industrial concern such as the defenders should have deduced from its content a risk to people living with its employees.

[120] In the first place, although I am attracted to Mance LJ's analysis, I do not agree with it. It is difficult, with the benefit of hindsight, not to wonder why it was that a substance

long recognised as dangerous should have been seen as foreseeably harmful only to those employed where it was used, rather than others to whom they might bring contamination.

[121] That said, however, it does not appear to me to be sustainable to find as fact that a reasonable and prudent industrial employer ought reasonably to have foreseen a risk of injury to a secondary victim, where that was not a risk described in the relevant literature. What Judge LJ relates at paragraph 57 in *Maguire* reflects the evidence in the present case: before 1965 neither the industry generally, nor those responsible for safety and health, nor the Factory Inspectorate, nor the medical profession, suggested that it was necessary, or even that it would be prudent, for risks arising from familial exposure to be addressed by the industry.

[122] The position is different, in my view, from October 1965 onwards. Not only had a very significant paper been published in a journal which should have been, on the unchallenged evidence of Mr Howie, something known to those responsible for health and safety within the defenders, but the subject had entered into more general public discourse through Dr Byrne's article in the *Sunday Times*.

[123] I consider that from 31 October 1965 at latest, the defenders ought reasonably to have foreseen that a risk of injury arose to persons in the position of the deceased by reason of their employees transporting asbestos dust home on their clothing. It was suggested to Mr Howie that the defendants in *Maguire*, as shipbuilders, might be in a different position from the present defenders. I do, however, accept Mr Howie's characterisation of the defenders as a very large and significant industrial employer. They made boilers, and as I have found below, boilers that were insulated with asbestos while still on their premises. They were in my view under a duty to concern themselves with contemporary knowledge in the field of occupational disease. That there were risks to health from working with

asbestos had been known for some considerable time before the 1960s, although knowledge about the nature and extent of the risks expanded during and after the 1960s. The need to consider risks arising from the use of asbestos would, or certainly should, already have been known to the defenders. This is not a situation in which, in my view, any significant period of time would have needed to elapse for a reasonable and prudent employer in the position of the defenders to appreciate the significance of the information in the Newhouse and Thompson report. The situation might conceivably be different for an employer of a different sort.

[124] I do not accept, as Mr Mackenzie suggested, that Newhouse and Thomson only put employers on notice where there was particularly heavy exposure, or where the employee primarily exposed worked in one of the jobs identified in section C of the appendix. No, alternative, later date was proffered in evidence. That, of course, does not assist the pursuers, who have to prove their case.

[125] Mr Mackenzie submitted in writing that

> "No reasonably prudent employer would have known of the dangers of domestic exposure before 1965, for the reason given by the majority in *Maguire.* …a precise analysis of what the defenders ought to have known would, considering the lack of evidence be futile. What ought to have been reasonably foreseeable to the defenders depends on the facts and circumstances of Mr Sweeney's working conditions."

I disagree with the latter part of that passage. The Newhouse and Thompson paper includes a number of cases of household exposure, arising in turn from a variety of different types of employment. It includes a number of neighbourhood cases. It revealed a variety of circumstances apart from direct or heavy industrial exposure in which contact with asbestos might cause serious harm, namely mesothelioma. Dr Byrne did not miss the point. He wrote:

> "Some of the current studies are designed to find out which variety of asbestos is the most noxious, and the minimum dose required to produce malignant changes. This could throw important light on the clinical disease for it seems that a very brief exposure to the dust can prove lethal in man."

[126] I note that Judge LJ recorded in *Maguire* that the literature subsequent to Newhouse and Thompson did not suggest "an immediate rush to face up to the implications of the Newhouse and Thompson papers, and perhaps more important, to the issues of environmental and familial exposure." Whether or not there was a rush to face up to the implications, the implications were clearly there, and in my view gave rise to an obligation to take reasonable care to avoid exposing family members to asbestos from workers' clothing.

[127] No evidence suggesting positively a later date than October 1965 was before me.

Exposure and liability

[128] Before turning to the evidence, I consider what it is that the pursuers have to prove in order to succeed, aside from foreseeability of harm. Parties differed as to the factual findings that would be required in order for there to be a finding of liability. On the pursuers' submissions, I required to be satisfied on the balance of probabilities that significant quantities of dust were generated during the period of Mr Sweeney's employment, and that as a result of his proximity to the dust, it would have got on to his clothing. It was not necessary that I make a finding as to the level of exposure, in terms of fibres/ml over any particular period of time.

[129] Mr Mackenzie submitted that the court would have to be able to find (a) that Mr Sweeney was so heavily exposed to asbestos while working for the defenders between 1963 and 1971 that he took home significant levels of asbestos on his boiler suit and/or

clothes; (b) the knowledge the defenders ought to have had about the risks posed at that level; and (c) that, with that knowledge, it ought to have been reasonably foreseeable to the defenders that asbestos related injury would arise from domestic exposure. It is implicit from points (b) and (c) that there should be some finding as to the level of exposure, and explicit from the reference that Mr Mackenzie made elsewhere in his submissions to paragraph 44 of *Williams*.

[130] I consider that any submission, had it been in the context of liability for injury to Mr Sweeney himself, that had proceeded on the basis that there must be heavy or prolonged exposure before liability could be established would have been bound to fail. That follows from the analysis in *Jeromson* v *Shell Tankers (UK) Ltd* [2001] ICR 1223. Judge LJ made an observation to similar effect in *Maguire* at paragraph 56. He was referring to passages in the judgment of Hale LJ in *Jeromson*, with whom Cresswell LJ and Mantell LJ agreed, at paragraphs 37, 51 and 52:

> "37. Mr Mackay, on behalf of Shell, argues that where the issue is whether any risk at all should have been identified, it is more appropriate to consider whether the average as opposed to the potential exposure was sufficient to ring the bell. However, where an employer cannot know the extent of any particular employee's exposure over the period of his employment, knows or ought to know that exposure is variable, and knows or ought to know the potential maximum as well as the potential minimum, a reasonable and prudent employer, taking positive thought for the safety of his workers, would have to take thought for the risks involved in the potential maximum exposure. Only if he could be reassured that none of these employees would be sufficiently exposed to be at risk could he safely ignore it.
>
> 51. Having reviewed the literature, the judge referred to the different conclusions reached at first instance, by Waterhouse J in *Gunn v Wallsend Slipway & Engineering Co Ltd* (unreported) 7 November 1988, and by Buxton J in *Owen v IMI Yorkshire Copper Tubes Ltd* (unreported) 15 June 1995. He could not agree with Waterhouse J that 'the literature justifies the conclusion until 1960, that asbestosis was attributable only to heavy and prolonged exposure'. He preferred the formulation of Buxton J that from the beginning of Mr Owen's employment in 1951:

> 'the difficulties related to and the threats posed by asbestos were sufficiently well known, and sufficiently uncertain in their extent and effect, for employers to be under a duty to reduce exposure to the greatest extent possible.'

He did so 'in the context of the absence of any means of knowledge of what constituted a safe level of exposure'. He accepted Mr Allan's submission that 'a reasonable employer, being necessarily ignorant of any future potential asbestos exposure, cannot safely assume that there will never be sufficient cumulative exposure'. In an uncertain state of knowledge, the risk could not (in the words of Lord Upjohn in *C Czarnikow Ltd v Koufos* [1969] 1 AC 350, 422 c) be 'brushed aside as far fetched'.

52. The point which impressed the judge was the certain knowledge that asbestos dust was dangerous and the absence of any knowledge, and indeed any means of knowledge, about what constituted a safe level of exposure. Mr Mackay's argument relies heavily on the explosion of knowledge which took place during the 1960s. Only then did it become apparent that mesothelioma could result from very limited exposure. In particular, it was only then that knowledge began to develop of the risks to those outside the workplace, such as the wife washing her shipyard worker husband's overalls (as in *Gunn*) or people living near to asbestos works. But just as courts must beware using such later developments to inflate the knowledge which should have been available earlier, they must beware using it to the contrary effect. The fact that other and graver risks emerged later does not detract from the power of what was already known, particularly as it affected employees such as these, working in confined spaces containing a great deal of asbestos which might have to be disturbed at any time. There is no reassurance to be found in the literature that the level of exposure found by the judge in this case was safe and much to suggest that it might well not be so."

[131] By way of context, the level of exposure found by the judge in *Jeromson* is set out in paragraph 39 of Hale LJ's judgment:

> "39. He found that engineers would be exposed to dust when insulation had to be stripped away and replaced. This happened most often when leaking joints had to be repaired, but from time to time when pipes burst, and during dry docking. Three experts (Mr Browne and Mr Deary for the claimants and Mr Finch for Shell) were agreed that stripping asbestos lagging by crude methods gave rise to high concentrations of visible dust, as did mixing asbestos powder with water to form a plastic mix for new insulation and dry sweeping of asbestos debris. Cutting asbestos lagging by handsaw gave rise to less high but still significant concentrations, and handling asbestos mattresses in bad condition to moderately high concentrations. At the time, however, there was no way of measuring such concentrations and until 1960 there were no published limits. The judge concluded that all but the last activity would have given rise to concentrations substantially above even the lower limits set in 1960 and the last to concentrations above those limits: 'I am quite satisfied that

> these five activities would have given rise to significant levels of visible dust … clearly there to be seen, if considered by any careful employer.' As for frequency:
>
> > 'In summary, I find that, at the material time, marine engineers employed by Shell were liable and likely to encounter intense concentrations of asbestos dust, on a regular basis. In the most part, these exposures would be for minutes rather than hours, but on occasion, both at sea and in dry dock, the exposures would be for hours and at even higher intensity.'"

[132] The reasoning in *Williams* runs along rather different lines. The deceased was exposed to asbestos as an undergraduate physics student between 1970 and 1974. He carried out experiments in a tunnel in which pipes were lagged with asbestos. Tests carried out in 2006 and 2007 identified crocidolite, amosite and chrysotile asbestos. The judge at first instance made findings as to the presence of significant amounts of asbestos dust on the floor of the tunnel, and that the lagging was in poor repair as at 1974. The exposure to asbestos fibres was about 0.1 fibres/ml but below 0.2 fibres/ml. The claimant succeeded at first instance, but the Court of Appeal allowed an appeal by the defendant in part because the issue the court should have addressed was whether the degree of actual exposure made it reasonably foreseeable to the defendant that the deceased would be exposed to the risk of contracting mesothelioma.

[133] This aspect of the decision in *Williams* proceeds on an analysis that accepts that there was (in that case, as at 1974) a level of exposure that the defendant was entitled to regard as safe, and that the safe level was to be ascertained by reference to *Technical Data Note 13* (7/11 in this process). That is apparent from paragraphs 60 and 61:

> "60. In my view it was not sufficient for the judge only to make the general findings on the state of knowledge about asbestos and mesothelioma noted at [53] above, even if coupled with the finding that if the University had had a report about the actual level of exposure to asbestos fibres as found, then the University would know that to send someone into the tunnel inevitably carried 'a risk'. I agree with Mr Feeny's submission that there could only be a breach of duty of care by the University if the judge had been able to conclude that it would have been reasonably foreseeable to a body in the position of this University in 1974 that if it exposed Mr

> Williams to asbestos fibres at a level of just above 0.1 fibres/ml for a period of 52–78 hours, he was exposed to an unacceptable risk of asbestos related injury.
>
> 6. In my view the best guide to what, in 1974, was an acceptable and what was an unacceptable level of exposure to asbestos generally is that given in the Factory Inspectorate's ''Technical Data Note 13' of March 1970, in particular the guidance given about crocidolite. The University was entitled to rely on recognised and established guidelines such as those in Note 13. It is telling that none of the medical or occupational hygiene experts concluded that, at the level of exposure to asbestos fibres actually found by the judge, the University ought reasonably to have foreseen that Mr Williams would be exposed to an unacceptable risk of asbestos related injury."

[134] It is not necessarily impossible to reconcile that passage of reasoning with that of Hale LJ in *Jeromson*. It may be possible to read it as identifying something that Hale LJ found was wanting in *Jeromson*, namely reassurance in the literature that a particular level of exposure was safe. I do not, however, read it in that way, and have some difficulty reconciling the two decisions.

[135] An important factor in *Jeromson* was "the certain knowledge that asbestos dust was dangerous and the absence of any knowledge, and indeed any means of knowledge, about what constituted a safe level of exposure". The circumstance that in 1960 the Ministry of Labour published a document containing a maximum permitted concentration of 177 PPCC (7/10) was before the court in *Jeromson*. The levels of exposure, at least at times, in *Jeromson* were thought to exceed that figure, but one of the findings in fact was that there was at the time no way of measuring the levels.

[136] So far as the 1970 document referred to in *Williams* is concerned, it is perhaps worth noting at the outset that it is prefaced with a warning that it had been prepared for the guidance of Factories Inspectors in relation to enforcement action, and a caution that "only the Courts can give binding decisions in these matters". They do not purport to be definitive even in the field of enforcement.

[137] The status attached to the 1970 document as a measure of what exposure gave rise to foreseeable risk similarly does not sit easily with the reasoning of the majority in *Maguire*. I have in mind the judgment of Judge LJ at paragraphs 56. He accepts that the correct question is whether, by a particular point in time, the difficulties related to and the threats posed by asbestos were sufficiently well-known and sufficiently uncertain in their extent and effect for employers to be under a duty to reduce exposure to the greatest extent possible. He went on to say that that analysis begged the question, in the context of secondary exposure, whether it was by a given date, or should have been, apparent to those whose employees worked with asbestos, that the health of individuals whose contact with it came second-hand and intermittently, and whose exposure to it lasted for peak periods only, was under threat. The reasoning of Longmore LJ at paragraphs 89-91 is to similar effect, and expressly refers to *Jeromson*: as between employer and employee the employer will be in breach of duty if he fails to reduce his employee's exposure to the greatest extent possible. I note that neither *Maguire* nor *Jeromson* was referred to in *Williams*.

[138] It therefore seems to me that if I were considering the matter as between employer and employee, I would not be looking at foreseeability of harm or breach of duty by reference to any particular level of asbestos in the environment. Rather, I would be considering whether the employer had reduced exposure to asbestos to the greatest extent possible and considering the consequences of any failure to do so.

[139] An employer in November 1965 would not have known what level of exposure to Mr Sweeney would give rise to risk of injury to the deceased, or what level of asbestos on clothing would be so low as to avoid that risk. The situation was exactly that described by Hale LJ in the passages quoted above. Whatever the position may have been before 1965, it must have been apparent in the light of the work by Newhouse and Thompson that there

was an absence of knowledge about what constituted safe exposure. In the words of Judge LJ, it began to be appreciated that there could be no safe or permissible level of exposure direct or indirect, to asbestos dust. Although Judge LJ used the word "began", I have concluded, for the reasons already given, that the realisation should have been swift, and the subject of swift action, for an employer such as the defenders.

[140] In addressing Mr Mackenzie's submission, therefore, I have come to the conclusion that I do require to approach the matter in the way desiderated in *Williams*. I do not require to look at the exposure either of Mr Sweeney or the deceased relative to figures published in either the 1960 document or the 1970 document. I was not shown anything that indicated that there was any particular level of occupational exposure to the employee that ought to have alerted an employer in the position of the defenders to the risk of a person such as the deceased. Counsel for the defenders asked Mr Howie about both documents, although he did not explicitly suggest in submission that the levels mentioned in that document should be taken as indicating the level of exposure for an employee that ought to have triggered action to avoid risk of injury to someone living with the employee.

[141] Assessing the actual level of exposure to an employee in a historical case of this nature is fraught with uncertainty. So is the exercise of trying to assess the level of exposure of someone in the position of the deceased. Against that background, I accept that it is relevant to ask whether the work Mr Sweeney he engaged in, or the work of those close to whom he worked, generated significant quantities of dust containing asbestos fibres. That, however, begs other questions, as to what is meant by "close to" in the particular work environment. Working in the same department may mean working in a vast industrial hall at a distance of anything from just a few metres to many, many metres. On the other hand, workers with different job titles may be employed together in very confined spaces, making

it easier to assess retrospectively their exposure, or at least to be satisfied that they were exposed to a significant extent.

[142] Before a duty to take precautions can arise there must be knowledge on the part of the employer that the employee is being exposed to an extent such as to create a risk that he will take asbestos home with him. I note that the finding made in *Maguire* at first instance was that the defendants must have known that Mr Maguire would transport home each day from work varying quantities of asbestos to some of which his wife would be exposed and that they must have known that the descriptions in Mr and Mrs Maguire's statements would have been typical among similar employees during the relevant period.

[143] Both counsel in their submissions used the word "significant" in relation to the finding that I would have to make as to the extent of Mr Sweeney's exposure to asbestos or the quantity of asbestos taken home as a prerequisite to a finding of liability. Neither defined what he meant by significant, other than insofar as Mr Mackenzie referred to *Williams*. As I have already indicated, the context is one in which there was no established, safe level of asbestos exposure, and there was knowledge that secondary exposure to people who lived with asbestos workers carried with it a risk of fatal injury.

[144] Seeking to draw together in order to establish negligence in this case, the pursuers would have to prove the following.

(a) Mr Sweeney was exposed to asbestos to an extent such that the defenders must have known he would take dust containing asbestos fibres home on his clothes.

(b) The defenders failed to reduce the risk to the deceased to the greatest extent possible.

[145] Little was said in submission about causation. The pursuers would require to prove that the deceased's exposure to asbestos from Mr Sweeney's work clothes materially increased the risk of her developing mesothelioma. Material in this context means more than minimal: see, for example, *Sienkiewicz*.

What have the pursuers proved in this case?

[146] I regarded Mr McCluskey as generally a credible and reliable witness in giving his account of what the deceased and Mr Watson told him.

[147] I am to some extent cautious about the evidence of Mr Brennan, and find it hard to dismiss from my mind that in one of his first answers in examination in chief he indicated that his knowledge of the use of asbestos in boilermaking at the defenders' Porterfield Road premises derived from his internet researches, rather than his own knowledge. I was uncertain in part as to what he remembered, and what he considered that he knew because he had seen information about it on the internet, particularly regarding the use of preformed asbestos. I accept his evidence about the scale of the premises. He gave it under reference to what bore to be plans of the site. I was more impressed by the detail that he gave in relation to the way that asbestos cloth and asbestos rope were used and manipulated, and I formed the impression that he was describing something that he had seen and done at first hand. His description of the use of asbestos rope was consistent with what Mr Watson told Mr McCluskey. His description of the use of monkey dung was also broadly consistent with what Mr Watson is recorded as having said. Where his account coincides with that given by Mr Watson to Mr McCluskey I have accepted it.

[148] I am satisfied on the balance of probabilities that the work of an engineer fitter in the period from 1964 to 1971 included the application of asbestos rope, asbestos cloth and

asbestos gaskets to boilers. I accept that Mr Sweeney carried out that work. I accept that on the basis of the account given by Mr Watson to Mr McCluskey. I begin with 1964 because that is the start of the period which I accept Mr Watson was describing to Mr McCluskey. I do not know exactly when Mr Watson's employment ended. It was not explicit in Mr McCluskey's account of what Mr Watson said, and was not noted in Mr McCluskey's note of their conversation. Mr Watson was, however, still working with the defenders at the time when they came to supply clean overalls, a change that the deceased's statement places later than 1971. I note also that Mr Brennan's work with the defenders ended in 1968. I consider it more likely than not that the use of asbestos did not cease suddenly coincidentally with the end of Mr Brennan's apprenticeship, and that it continued for some time thereafter, and have taken that into account in support of Mr Watson's account.

[149] Mr Mackenzie suggested that it was not clear that Mr Watson was describing a period after 1965, and that he may have been describing the period of his apprenticeship in the 1950s. I reject that contention. It seems to me very unlikely, given that the claim being investigated was that of the deceased, who married Mr Sweeney in 1961, that the focus of discussion would have been a period in the 1950s. As I have already mentioned, he gave an account of the provision of clean overalls, an event which the deceased placed after 1971. It appears to me more generally that he was describing his work and that of Mr Sweeney as time-served employees when he spoke about where Mr Sweeney worked, and about the duties of fitters "all over the works".

[150] I accept that asbestos paste or monkey dung was used to some extent in lagging the boilers while they were still in the Porterfield Road premises. I am not able on the evidence to make a finding as to exactly how it was used in lagging the boilers; for example as to whether the whole surface was covered or whether it was used to fill particular areas. I

accept that the process of mixing asbestos paste created substantial quantities of dust and that the dust contained asbestos fibres. I

[151] I accept that Mr Sweeney brought dusty clothes home with him. Whether the deceased had any basis in her own knowledge or from discussion with Mr Sweeney for her statement that the clothing had asbestos dust on it, I do not know.

[152] I accept that the deceased shook out and washed Mr Sweeney's work clothes in the manner described in her statement. Her statement is imprecise as to the frequency with which she did so, but I infer from what she said that this was a regular occurrence, carried out throughout the different seasons, and, on the balance of probabilities, at least weekly. I infer that the defenders knew or ought to have known that work clothes would be cleaned at home, given that they did not provide clean clothing themselves.

[153] I do not know when the practice of supplying overalls once a week began. The deceased's statement indicates that it was not until after a house move in about 1973. Mr Watson said that overalls were provided once a week "later on".

[154] I do not know where Mr Sweeney worked relative to the laggers. I do not know how often he worked close to employees who were producing asbestos paste. I do not know how regularly he handled material such as rope or cloth that contained asbestos fibres.

[155] As mentioned, Mr McCluskey was asked, without objection, whether it had been clear from what he learned from Mr Watson that asbestos was being broken up and cut. I observe, first, that that is a leading question, and that the answer given to a leading question may attract rather less weight than evidence given in response to an open question. The answer he gave was that Mr Watson spoke about dust being released from those processes. That is not a direct answer to the question. That Mr Watson spoke to Mr McCluskey about the cutting and breaking up of asbestos is not obviously supported by the content of

Mr McCluskey's notes. I am not satisfied that Mr Watson described asbestos being broken up and cut when he spoke to Mr McCluskey. I am satisfied on the basis of Mr McCluskey's notes that Mr Watson described dust being generated from the operations involving rope asbestos. I am satisfied that those operations generated dust, which floated in the air.

[156] I do not find it hard to credit, in general terms, that asbestos was used in the making of boilers in the 1960s. The situation is rather different from that confronting Lord Pentland in *Prescott*, where there is a sense of a pursuer searching for an explanation as to how he might have been exposed to asbestos against a background of employment not obviously involving potential exposure. I do not regard the table in 6/48, which dates from 1967, describing the use of asbestos in boiler making as "occasional" as casting light on the question as to Mr Sweeney's exposure, or the use of asbestos at the defenders' Porterfield Road premises. The 1967 document derives from the realisation that workers outwith the asbestos industry were at risk. Some estimate of those outside that industry who themselves were exposed by using or manipulating asbestos was attempted, and there was a recognition that much larger numbers of employees might be at risk. What it shows, in my view, is that central government, and those experts then advising central government, knew that there was a significant population at risk and potentially at risk, and did not have sufficient information fully to assess the scale of the problem. Against that background, a description of use in a particular industry as "occasional" does not carry any real evidential weight when trying to assess what happened in a given workplace, during a given period.

[157] The more general evidence from Mr Howie about his knowledge of the use of asbestos in boilermaking is not irrelevant. Evidence is relevant when it either bears directly on a fact in issue or does so indirectly because it relates to a fact which makes a fact in issue more or less probable: *CJM (No 2)* v *HM Advocate* 2013 SLT 380 at paragraph 28, and

authorities cited there. While his general evidence about boilermaking may not make it much more likely that asbestos was used in a particular operation in particular premises, it is relevant in that it is evidence that supports the likelihood that asbestos was used in the making of boilers.

[158] No positive evidence was adduced to contradict the evidence led for the pursuers about the use of asbestos by and in the presence of fitters in the Porterfield Road works.

[159] I accept that it is more likely than not that the deceased developed mesothelioma as a result of being exposed to asbestos. Mr Howie's evidence that idiopathic development of asbestos was extremely rare was not challenged, and I accept it. It is very much more likely that she developed mesothelioma because she was exposed to asbestos. That might be in the environment generally, or it might be by some other means. That she developed mesothelioma does not lead to an inference that she was exposed to any particular degree; her exposure may have been slight, as Dr Semple said. I am satisfied that the source of the asbestos was more likely than not to have been asbestos on Mr Sweeney's clothes, as I am satisfied that he was exposed to asbestos in the course of his work and that he brought home dusty clothes. I am not satisfied that there is evidence of any competing, or even additional, potential source of exposure so far as the deceased is concerned. I am satisfied that he did work with asbestos, that dust was produced by that work, and that dust containing some asbestos fibres will have ended up on his clothes. Again, because mesothelioma may result from slight exposure, it does not follow from the fact that the deceased developed mesothelioma that Mr Sweeney brought home any particular quantity on his clothes or with any particular regularity.

[160] I have no evidence about the level of asbestos fibres in the dust generated by the operations involving rope or cloth. Mr Howie did not give evidence about that. I disregard

Mr Howie's evidence about the dust produced by cutting or handling preformed sections of asbestos. Having excluded as inadmissible the evidence from Mr Brennan on this matter, there is no factual basis for the proposition that Mr Sweeney was exposed to dust generated from this operation.

[161] Mr Howie's evidence, including the photograph reproduced in his letter, supports the proposition that this activity gave off considerable, or substantial, quantities of dust, although it appears to be a photograph of an insulator or lagger, rather than someone working in the same environment as an insulator or lagger. Mr Howie's figures for estimated exposure to Mr Sweeney from this activity were the subject of criticism. Any figure is going involve speculation, of a more or less informed nature. I accept that the figures Mr Howie took from the literature are a reasonable starting point. They may well be the best evidence available. They indicate that some processes generated more fibres of asbestos per ml of air than others did. The processes associated with creating monkey dung produced very considerable quantities of dust, and concentrations of asbestos fibres that greatly exceeded the 177 PPCC figure in the 1960 document.

[162] If there had been evidence that Mr Sweeney worked within a particular distance of the laggers, that might have provided a basis for an opinion from Mr Howie as to the extent of exposure. If I had heard evidence about working right next to laggers, or a few metres away, or working alongside them in a relatively constricted space, I might have been prepared to draw an inference even absent an opinion of that sort. In the absence of information about that person's distance from the laggers, in the context of working environments of quite a vast scale, as described by Mr Brennan, the figures in the literature provide limited information about Mr Sweeney's actual exposure.

[163] What is clear, however, is that Mr Sweeney worked in the Porterfield Road works for a long time, and that he did so in the capacity of a fitter. Although it would certainly have been desirable and helpful to have more detailed information from Mr Watson, he described a very dusty atmosphere resulting from the use of asbestos. He saw Mr Sweeney directly involved in the use of materials containing asbestos. He described asbestos being "everywhere" in the context of laggers being on site. He was being asked about these matters in the context of an inquiry being made of him about the conditions in which Mr Sweeney worked. It is notable that the work was such that, at some stage, the defenders provided "industrial masks". That connotes understanding on their part either that there was dust which was itself injurious, or that there was dust in a quantity such as to give rise to a need for protection. The assembly of boilers was, according to Mr Watson's account, the main point where asbestos came into play. He said that Mr Sweeney worked in "assembly and tube". The deceased said that Mr Sweeney worked "in the construction of boilers". I have no reason to doubt any of that information. The description of him working in the construction of boilers is consistent with a description of him working in "assembly".

[164] Given the duration of Mr Sweeney's employment as a fitter, and the description given by Mr Watson to Mr McCluskey , which I accept, I am satisfied that he would over a substantial number of years have been exposed to varying quantities of asbestos dust, and that he took dust containing asbestos fibres home with him on his clothes. I am satisfied from the description of the work given by Mr Watson that this exposure would have been known to the defenders, and that the quantities of dust produced by the operations, particularly those involving the production and use of asbestos paste, should have alerted them to the risk that dust would be carried home on clothing.

[165] So far as evidence relating to the deceased's exposure is concerned, any estimate, to borrow an expression used by Judge LJ in a similar context in *Maguire*, is at best informed speculation. Mr Mackenzie criticised Mr Howie for his reliance on the figures referred to in *Maguire* at paragraphs 14 and 15. He had taken a figure agreed by the experts in that case. What the experts had done in that case was to refer to an experiment, involving two sets of contaminated overalls worn by two employees of a company with a factory in Rochdale, reported in an internal memorandum dated 7th April 1970. The memorandum itself was included in the papers available to the Court of Appeal, and presumably also to Morland J. Judge LJ narrates (paragraph 14):

> "On the face of it, this was indeed an experiment rather than research. The short note of the result begins: 'Purely as a matter of interest I did some dust tests on two sets of overalls …' The clothes were worn by two individuals who were examining the inside of a dust extraction plant. Inevitably therefore the clothes were very dusty. They were shaken for about 15 to 20 seconds. The joint experts think it likely that the overalls were indeed deliberately shaken for the purpose of testing, and that they were shaken shortly after being removed by the original wearers. The results of these tests translated into the facts of the present case produced this agreed observation:
>
> > 'If the dust on the [Mr Maguire]'s clothing had contained between 15-50% of asbestos fibres depending on what asbestos-based materials he had encountered and/or had been using … we are agreed that all other factors being equal, a person who shook overalls, which were contaminated with dust containing between 15-50% asbestos fibres, could have been exposed to an average asbestos fibre concentration in the range 30-100 fibres/ml [millilitres].'"

[166] I do not regard the presence or absence of evidence about the actual level of exposure of the deceased as of particular significance in considering negligence. As I have said, it will be impossible to produce more than informed speculation as to the level, and I do not regard a finding as crucial to establishing liability. In relation to the evidence in this case, however, I make the following observation. It is not necessarily hard to produce a figure for the length of time that a person would take to shake out clothing, whether by experiment or

reasonable estimate based on common experience. It may be reasonable to apply an estimate of that sort to data from another source about the exposure produced from the exercise of shaking out dusty clothing. What concerns me in this case is the source of the data. If a party is seeking to establish exposure at a particular level, it is not good enough to present to a court a figure taken from the court report of another litigation as representing what was agreed evidence in that case. It is perfectly legitimate for an expert witness to use figures derived from the literature associated with a particular discipline or endeavour. When the literature is produced it can be scrutinised. The literature, brief though it seems to have been, was actually produced in *Maguire*. The context in which particular experimental results have been achieved, or observations recorded, can be considered when literature is produced. The methodology can be looked at. These factors may cast light on the reliability of the data recorded in the literature, and may make it apparent that they are, or are not, data relevant to the subject on which the expert is providing an opinion. That sort of scrutiny cannot be applied where a witness has simply used a figure agreed in another litigation.

[167] In relation to causation, an estimate of exposure is of some use, in that, in relation to causation, the court requires to consider whether the exposure materially increased the risk of developing mesothelioma. If the increase in risk were even a small fraction of that described by Mr Howie (who gave a figure of at least forty-fold in each year), I would regard it as material. If the deceased shook out and washed clothes visibly contaminated with dust, at least once of week, over a period of years, and that dust contained asbestos fibres, then it seems to me that, on the balance of probabilities, her risk of developing mesothelioma would be materially increased.

[168] I am satisfied that the defenders failed to reduce the risk to the deceased. There was no safe, known level of exposure. Against that background, what an employer required to do, so far as an employee was concerned, was to reduce the risk to the lowest level practicable. Once it was appreciated, as it was from late 1965, that there was a risk to persons in the position of the deceased, the duty was, again, to reduce the risk to the lowest level practicable. I am satisfied on the evidence that no precautions were taken so far as Mr Sweeney was concerned, and that no precautions were taken to protect the deceased until after 1971. In determining the standard of care required of somebody on whom the duty of care is imposed, a court has to have regard to the probability of harm caused as a result of the breach of duty and also the probable seriousness of the harm: *Rice*, Silber J, at paragraph 81. There was, as Mr Howie said, a simple precaution that could easily have been employed so far as the risk to people living with employees was concerned. It is a precaution they eventually took. As with risks to employees, that risk, and the appropriate precaution, must be viewed against a background where there was no known safe level of exposure. That precaution would have been to have work clothes left at work, and cleaned there, as happened at some later stage. I do not require in this case to make a very fine judgment as to precisely when the defenders should have introduced the precaution. As I have said, the defenders were a major industrial concern. They were aware of the risk in late 1965. They should have acted promptly, within a period of months of October 1965.

[169] I make the following comment on the passages quoted at the beginning of this Opinion. I have no real difficulty with the proposition that the court should do its best with the material before it, or with the pragmatic approach adopted by the first instance judge in *Harris* and approved by the Court of Appeal. I do query the notion that in deciding a case in one way rather than the other a court would ever be "sheltering" behind the burden of

proof. A court will always have to assess whether there is enough material in the evidence to justify the conclusion urged by a party, applying, in civil cases, the test whether something has been proved on the balance of probabilities. It is realistic to approach evidence about events in the distant past on the basis that it will probably contain less detail than an account of more recent events.

[170] In *Sienkiewicz*, in the passage quoted, Lord Rodger was referring to the findings of the judge at first instance in one of the cases actually before the Supreme Court - *Knowsley Metropolitan Borough Council* v *Willmore*. Lady Hale described the findings as "truly heroic" (paragraph 173). Lord Mance said they were "slender and speculative", although the Supreme Court did not overturn the findings in question. The Fairchild exception is the rule that any exposure which has increased materially the risk of developing mesothelioma will be treated as having caused mesothelioma. The pursuer does not have to prove on the balance of probabilities that particular exposure caused the condition. The rule is of particular relevance where a person has been exposed to asbestos by more than one potential defender, and also where exposure may have been both in the environment generally and at the hands of a particular defender. The state of medical knowledge does not permit the identification of the exposure which caused the mesothelioma. I note that in *Willmore* the claimant had herself identified a source of exposure other than the defendant (see: *Willmore* v *Knowsley Metropolitan Borough Council* [2009] EWHC 1831 (QB), at paragraph 5. Lord Rodger's point is that the usual rules about causation have been relaxed broadly to the advantage of the pursuer and the disadvantage of the defender, to permit recovery of damages where the scientific knowledge as to causation of the condition is lacking in particular respects. Where there has been relaxation of one requirement usually imposed on pursuers, relaxation of others would disturb the balance struck by the law. I

accept that courts should not exercise themselves to make "heroic" findings. If difficulties of proof in historic cases make it difficult to achieve justice, that may simply be an indication of limitations inherent in a system which requires proof of fault before compensation is payable.

[171] For the reasons set out above I am satisfied that the defenders negligently exposed the deceased to asbestos, and materially increased the risk that she would develop mesothelioma. I accordingly award damages in the sums set out the joint minute.