OUTER HOUSE, COURT OF SESSION

[2026] CSOH 104

A95/14

OPINION OF LORD YOUNG

In the cause

(FIRST) THOMAS CHALMERS and (SECOND) GAIL CHALMERS

Pursuers

against

DIAGEO SCOTLAND LIMITED

Defenders

Pursuers: Moynihan KC, Nicholson-White; Balfour Manson LLP
Defenders: G Walker KC, J Cormack KC (sol adv), Turner, T Young, A McWhirter; Pinsent Masons

20 October 2026

Introduction

[1] The pursuers purchased their house at 42 Woodlea Gardens, Bonnybridge in 2002. It sits in a modern residential estate comprising over 200 houses. When the pursuers purchased the house, they were particularly drawn to its open aspect at the front onto a community open space including a children's playpark and, at the rear of the house, to an area of nature reserve. The defenders have operated a bonded warehouse complex to the south-west of the nature reserve from the early 1980's. There are now nine bonded warehouses in which whisky is matured. The distance from the closest edge of the pursuers'

house to the nearest warehouse is around 370 metres. In this action, the pursuers claim that the defenders have created a nuisance which affects the amenity of their property. They claim that ethanol which evaporates into the atmosphere from the whisky casks stimulates the germination, growth and development of a fungus called Baudoinia which has caused blackening on the exterior of the house.

History of these proceedings

[2] This action commenced on 21 February 2014. It is fair to say that the progress of the cause through to a proof before answer has been hard fought. There have been three procedure roll discussions reported at [2017] CSOH 36, [2019] CSOH 63 and [2023] CSOH 43. The defenders reclaimed the decision reported in 2019 but ultimately discontinued that appeal. A reclaiming motion did proceed against the 2023 decision, and it is reported at [2024] CSIH 2. Along the way, two proof diets have been discharged. A proof before answer finally commenced before me in 2025 in which I heard evidence over a period of 17 days followed, later in the same year, with 2 days of submissions.

Pursuers' witnesses

Thomas Chalmers

[3] Thomas Chalmers adopted his written statement. He was 59 years of age when he gave evidence and was employed as a computer analyst. He purchased 42 Woodlea Gardens with his wife in 2002, and they were the first occupiers of the house. They have one child aged 21 at the time of the proof. The house was attractive to them as there was a playpark area at the front and a nature reserve at the back. They had been aware that the

defenders had bonded warehouses beyond the nature reserve but that did not trigger any concern when they were contemplating their purchase.

[4] The house is a detached 4-bedroom house with an integrated garage. There is light brown/yellow stonework on the lower half of the exterior wall and white roughcast on the upper half.

[5] He first noticed an issue in their second year at the house. He noticed a black dust on patio paving, wooden garden furniture and children's toys. It was difficult to remove this black dust, and it needed to be scrubbed off. He used a power washer and bleach on the patio. The problem continued and appeared, in his view, to increase around 2009-11 which he ascribed to the extension of the Diageo facility at that time. He also started to notice blackening of the sides of the house especially at the back of the house.

[6] In 2005 a local action group was formed because people were frustrated by the need to regularly clean their properties. He was aware of this but did not join it. He was also aware that in 2006, Health Protection Scotland published a report in relation to their investigation of black mould on properties in Bonnybridge. He was not aware of anything happening as a result of that report. After matters deteriorated in 2009-11, he carried out some internet investigations and identified a lawyer in Kentucky who had clients with the same problem.

[7] He explained that he spent time cleaning his house. He described having to "bleach" the house. The frequency depended on the weather, and it could be once or twice a year, or sometimes every couple of years. He cleans the patio and sundeck with a power washer and then uses bleach once or twice a year. This can take a whole day to complete. He now buys dark garden furniture which will not show the discolouration as much. The exterior walls of the house have been cleaned with bleach every 2 or 2½ years. The windows are made of

PVC and they need to be scrubbed clean of blackening. He now pays £170 for a man to do this as it is time consuming and he suffers from a back pain. The gold ornamentation on his mainly black metal garden gate also gets covered in black deposits which he removes with a wire brush and then repaints. The guttering and vents of the house are cleaned once or twice a year.

[8] He gave evidence that other houses in the near vicinity show signs of blackening if they are not cleaned. His written statement referred to a house at 30 Woodlea Gardens which had been left empty for 3 to 4 years and which was "consumed" by blackening due to the lack of regular maintenance. This house was about 100 metres from his own house. He was shown a photograph of this house taken at a later date which showed the exterior of that house in pristine condition. He considered that this further photograph showed that 30 Woodlea Gardens had been professionally cleaned. In cross-examination, he was taken to a home report in relation to this house which noted that the house had repair category 3 (the most severe) for dampness, rot and infestation.

[9] He spoke of the costs of replacing the garden furniture. He considered this different from the cleaning required of garden furniture in his previous house. He had to scrub and use chemicals. He painted the garden fence every other year in a dark brown colour rather than a preferred cedar red. He purchased bleach in large plastic containers costing £50 each which includes delivery costs. He would use two or three containers if the blackening was severe.

[10] The family cars were also affected by blackening. He described this as "spotting" which gets bigger. It cannot be power washed off and a car wash does not remove the blackening. It can be removed with a non-scratch sponge or by professional valeting. He pays around £240 per annum for valeting of both cars.

[11] He described the blackening in and around his house as "unsightly and depressing". He was keener on moving away than his wife. He explained the role which he played in a "pipe experiment" carried out by Dr Joanne Taylor in 2024. He took monthly samples from marked sections of a section of plastic pipe placed in his garden. He did this by placing a piece of Sellotape onto the pipe before removing it and putting it on a labelled glass slide. He stored the glass slides as instructed by Dr Taylor before she collected them from him.

[12] In cross-examination, he agreed that he took good care of his house and that he might clean his house more frequently than others. He was shown photographs of several houses in Kilsyth, Denny and Cumbernauld which he agreed showed greater discolouration than could be seen in the November 2024 photograph of his own house. He agreed that if he lived in any of these houses, he would want to clean the outside walls. He pointed out in his answer that he did not know if the blackening on these other houses developed as quickly as it did on his house. He agreed that a degree of routine maintenance was required for all houses but considered that the maintenance of his house, which included using bleach on walls and other items, was beyond routine maintenance. He was asked in cross-examination why no receipts had been produced for the additional costs said to be incurred. His response was that "I never really kept receipts….Why would I keep them?"

Patricia Michie

[13] Mrs Michie has lived at 34 Corona Crescent in the Woodlea Estate since 2002. Her house is at the end of the street in which the pursuers live. She described her house and it's setting as beautiful, but she said it had been ruined by the blackening of the walls and internal items like her blinds. The white PVC on her conservatory and its glass roof get

badly affected by blackening. She needs to pay for the blackening to be removed from the house and garden approximately every 1 to 2 years. It costs her about £500-600 to have the cleaning carried out. She had attended a meeting at the Village Hall at which American lawyers had explained that blackening of properties in Kentucky close to bourbon plants had benefited from a filtration system. She wanted something done to fix the issue.

Gail Chalmers

[14] Gail Chalmers was aged 52 and worked as a café manager at the time of proof. Gail Chalmers described taking care when selecting their current house. The nature reserve at the back and the playpark at the front were attractive features. She recalled first noticing blackening after a couple of years. Outside toys such as an orange slide would blacken. These plastic toys needed to be scrubbed to remove the discolouration. In her view, the issue became much worse after additional warehouses were constructed by the defenders in around 2010. The external walls, windowsills and terracotta roof all became affected by blackening. She thought that the first appearance of blackening was underneath the corners of windowsills.

[15] They clean the external walls of the house every year or so. During the summer, she described a constant noise from power washers being used by neighbours. The playpark had brightly coloured equipment and a green fence, all of which is now black. She described black spotting on the metal and mirrors of her car. She paid for an extra protective coating on the exterior of a new car, but this has made no difference. She pays to get her car valeted.

[16] She described the effects of the blackening as being depressing. The time spent cleaning or organising the cleaning of the house limits her time off to simply enjoy the

garden. She wants to remain in the house which she regards as her family home but finds the continual work exhausting.

[17] She was shown photos of other houses in Denny, Kilsyth and Cumbernauld. She agreed that they all exhibited discolouration but did not think any of them were as bad as her house.

Dr Joanne Taylor

[18] Dr Taylor has been a mycologist since 1994. She is employed at the Royal Botanic Gardens in Edinburgh. She also lectures to second year undergraduates at the Edinburgh University. She is the managing editor of "The Lichenologist". She described lichens as fungal organisms which have a relationship with algae.

[19] Dr Taylor was first involved in this litigation in July 2021 when she was tasked with the collection of samples from various locations at the pursuers' property. She carried out this sampling alongside Mr Jacques instructed by the defenders. Five locations at the property were selected namely (i) the side of the house, (ii) garden gate, (iii) side garden fence, (iv) back garden fence, and (v) side garden hut. She had consulted with Dr James Scott in advance as to the best sampling techniques to use. Photographs of each locus were taken which showed the sample cards recording each sample. Different methods were used to obtain samples namely tape, a brush and a blade. She used tape consistently at all locations but otherwise varied between a brush and blade. In relation to the harling on the pursuers' house, Dr Taylor used a brush (a toothbrush) which was then placed inside a Falcon tube and sealed. She found that a blade was ineffective on the harling as it resulted in the sample being flicked off the surface. It was difficult to collect. For taped samples, the tape was stuck to the side of a Falcon tube. When she did use a blade, she would scrape

directly into a tube. Dr Taylor took four samples from each location using different sampling methods. She sent these samples to a company called Jonah Ventures in the USA which she understood would carry out DNA extraction and sequencing. Mr Jacques took single samples using a blade from the five locations.

[20] Her next involvement was on 31 March 2022 when she visited Bonnybridge and prepared a short report of that visit. She walked through the nature reserve which separates the warehouses from Woodlea estate. She described several of the trees being blackened as if they had been subjected to fire. This was not something she had seen before. The black growth was thick and obscured the bark. She took a sample of blackening from a tree branch in the nature reserve and subsequently analysed it using a microscope. Her conclusion was that the fungus sampled from the tree branch was Baudoinia as described by Dr Scott in various published papers. She also described observing blackening on some of the houses in the Woodlea estate including around the plastic fascias or window frames. She did not see similar degrees of blackening when driving around Kilsyth. Dr Taylor did not specifically report on the pursuers' property on this visit.

[21] Dr Taylor was involved with a further sampling exercise in November 2022 based on Professor Hawksworth's suggestion. Mr Jacques was also present during this exercise and Dr Taylor split her samples into two so that the defenders had a matching sample. The samples were taken at different points along transects radiating out in eight directions with the defenders' warehouse as the centre point. The pursuers' property was not one of the sampling points. There was a distance of approximately 250 metres between each sampling point on each transect line. At each sample location, she took samples from three different sub-strata (i.e. stones, trees, metal, plastic) depending on what was available at each location. The decision on what surfaces to sample was taken after discussion with Mr Jacques. Slides

for microscopic examination were created by Dr Taylor from the various samples taken on these transects.

[22] Dr Taylor then sought to identify the presence or absence of Baudoinia on each slide using a randomised number technique. She used a series of randomised numbers to identify twenty different parts of each slide which were then analysed for the presence or absence of Baudoinia spores or hyphae. A percentage was calculated for each slide to reflect the presence of Baudoinia by reference to these 20 randomised points. A "heat map" was then prepared with coloured codes for each sample location. The colour codes represented the percentage of Baudoinia identified for that sample location. The heat map demonstrated that the slides showing the highest percentage of Baudoinia were from sample points immediately surrounding the warehouse in each direction. Thereafter, the heat map demonstrated that the highest percentages of Baudoinia were found on samples taken from locations to the north-east and east of the warehouse. The percentages decreased further from the warehouse. The two sample locations closest to the pursuers' house, which is almost directly north-east of the warehouse, showed high levels of Baudoinia. In cross-examination, Dr Taylor conceded that two of the sample locations were incorrectly coloured on her heat map as indicating the greatest prevalence of Baudoinia, but this did not greatly change the pattern disclosed on the map.

[23] Dr Taylor's report on this experiment also sought to draw conclusions as to the types of surface on which Baudoinia was more prevalent. Stone and cement surfaces (with one exception) did not appear to support Baudoinia growth. She found that galvanised metal was free of Baudoinia although it was colonised with plaques from an unidentified fungus. In contrast, painted metal surfaces were found to be colonised by Baudoinia. Plastic and wood surfaces (including trees) were commonly colonised with Baudoinia and other fungi.

She expressed the view that Baudoinia could be viewed as a pioneer species since analysis of a sample taken from a lamppost which appeared to have been cleaned up to a certain height, showed sparse levels of Baudoinia with little other fungi on it.

[24] In October 2024, Dr Taylor produced a short report setting out the detail of an experiment ("the pipe experiment") which recorded the build-up of fungi on a section of pipe placed at the pursuers' property. The original intention had been to use two surfaces, a fascia board and a plastic drainpipe, placed in the pursuers' garden. Control samples were to be placed at an equal distance from the warehouse but along one of the transects where no Baudoinia had been identified on the 2022 heat map.

[25] The pipe experiment put into effect differed from that original plan. A section of plastic drainpipe was acquired and cut into three parts. One part was placed in the ground beside the pursuers' garden shed and another part was placed as a control in Dr Taylor's garden in St Monans, Fife. Dr Taylor's garden was used for convenience to avoid a monthly journey to and from Bonnybridge. The third section of pipe was retained as material which was not exposed to the open environment. The pipes were marked into 12 sections. Each month, a piece of tape was applied to a marked section and then removed and placed on a slide. For convenience, Dr Taylor arranged for Mr Chalmers to carry out the tapings at his property. She said that the slides were posted to her for analyse. Dr Taylor described this as a preliminary study or a proof of concept to observe what happened on a clean inert surface over time at the pursuers' property. The study commenced in April 2024. Photographs of the drainpipes in October 2024 showed blackening on the section which was in the pursuers' garden. No such blackening appeared on the control within Dr Taylor's garden.

[26] Dr Taylor carried out a similar exercise of analysing for the presence/absence of Baudoinia by looking at certain points on each slide taken from the pipes. On microscopic

analysis of the slides relating to the pipe in the pursuers' garden, Dr Taylor found evidence of Baudoinia germination and growth from the third month of the experiment. By the fifth sampling point, she was identifying Baudoinia at all test points on the slide. She found no evidence of any fungi on the slides from the pipe in her own garden. She found it surprising to see a single fungus able to germinate on an inert surface. Her report contained photographs of the spores and germinating spores found on the pipe at the pursuers' property which she identified in court as being Baudoinia. The defenders put a number of criticisms of the pipe experiment to her for her comment. She agreed that measuring the same sample many times is not replication of the experiment. Replication was repeated experiments to provide independent results. She disagreed with the proposition that a single set of results was not scientifically valid. Rather, she said, it was a starting point which required further testing.

[27] In terms of the techniques for identification of a fungus, she described microscopy as the "first port of call". This would involve using a light microscope and an electron microscope. She had experience of using DNA analysis when trying to describe a new species of fungi. She would use DNA analysis to back up her morphological findings. She explained that to identify a fungus morphologically, it was necessary to see the spores and the structures which produced spores. She always does culturing studies alongside any DNA metabarcoding studies. Her understanding was that fungi and plants have cell walls which need to be broken down to release DNA from the cells. DNA analysis is dependent on the cell walls being broken down in this way. Once DNA is extracted, a particular gene (ITS) is analysed and compared with other fungi using a phylogenetics tree. A phylogenetic tree demonstrates the relatedness of different specimens.

[28] In cross-examination, Dr Taylor agreed that Baudoinia could be a difficult fungus to identify but she was satisfied that she had correctly identified it on the slides examined by her in 2022 and 2024.

Dr James Scott

[29] Dr Scott is a mycologist. He is a professor at the University of Toronto and a director of the UAMH centre for Global Microfungal Biodiversity which is a fungal culture biobank. He is also the owner of a business called Sporometrics Inc which provides analysis of fungi and bacteria in the built environment, and commercial testing for cosmetics and drugs companies. Sporometrics has ISO accreditation from the American Industrial Hygiene Association Laboratory. Dr Scott had prepared, along with Dr Summerbell, three reports which were before the court dated 11 December 2013, 27 April 2022 and 16 January 2025. These were joint reports with each contributing to the conclusions which reflected their consensus opinion. Dr Scott could not recall any matter in which he compromised his opinion to reach a consensus with Dr Summerbell.

[30] Dr Scott's involvement in researching fungi potentially linked to alcohol production commenced in 2001. He was approached by Hiram Walker, a distiller in Canada, to have a look at black fungal growth on homes close to their bond warehouses in Windsor, Ontario. This had been prompted by two reports from the Provincial Ministry of Environment in Ontario which had concluded that there was a correlation between emissions from bond warehouses and fungal growth. At the time of the approach from Hiram Walker, he was not aware that black growth had been reported close to bonded warehouses. Since then, he has researched similar black fungal growths throughout the world, and he became aware from people in the distilling industry that black growths are a familiar issue. What struck him

when he first became involved in investigating these black growths was that it could be seen on stainless steel which was, for him, an unexpected finding.

[31] His investigations for Hiram Walker involved taking samples from the bond warehouses and from offsite. He analysed the samples microscopically and identified a fungus with very thick dark walls, in barrel shaped chains of spores. The samples appeared to consist predominantly of this fungus. He isolated individual spores into cultures and waited for them to germinate. The cultures grew very slowly. With the aid of a colleague based in Ottawa, he was able to compare the cultured spores with the reference specimen held in a herbarium for a fungus called Torula compniacensis.

[32] Towards the end of his work for Hiram Walker, Dr Scott was sent copies of email correspondence from December 2002 passing between one of his colleagues and an employee of the defenders, Keith Law. Keith Law's email included a question-and-answer document which he had produced which indicated that some organisms were able to exploit the vapour from the "angel's share" resulting in a film of organisms on surfaces such as warehouse walls, nearby trees and houses close by. The same paper noted that there were no public health implications.

[33] Dr Scott's research led to a paper which he prepared along with others in 2007. The paper was peer reviewed and published by the Mycological Society of America (Mycologia, 99(4), 2007 pp 592-601) entitled "*Baudoinia*, a new genus to accommodate *Torula compniacensis*." This paper described a genus of fungi found on exposed surfaces subjected to large diurnal temperature shifts, episodic high relative humidity and ambient airborne ethanol. Morphologically, the fungus possessed dark brown conidia with thick walls. It appeared to be the same fungus as that given the name Torula compniacensis by Richon and Petit in the 19th century. Richon and Petit had been describing a black fungus found on

the walls of a cognac distillery in France. Dr Scott's work demonstrated that the black fungus was not, as Richon and Petit had considered, related to the Torula genus but was a new genus. Dr Scott re-named the fungus, Baudoinia compniacensis. The name Baudoinia was in honour of Antonin Baudoin who had first described blackening seen on buildings in the cognac region of France.

[34] The next development in terms of the identification of Baudoinia occurred in 2016. In 2016, Dr Scott and others reported on multi-locus DNA sequencing of the Baudoinia fungus ("Multi-locus DNA sequencing of the whiskey fungus reveals a continental-scale speciation pattern", Persoonia 37, 2016, 13-20). Their DNA molecular analysis of 19 strains from environmental samples identified four further species of Baudoinia. The further species were named by reference to the locations where they were found, namely B. antillienis (Caribbean), B. caledoniensis (Scotland and UK), B. orientalis (South Korea) and B. panamericana (Continental America). These further species were morphologically indistinguishable from each other and could only be differentiated from each other using DNA molecular techniques.

[35] The growth of the single spore isolations was slow so Dr Scott tried different media to see whether growth could be sped up. He added ethanol to the medium since the fungus had been taken from a bonded warehouse. Dr Scott discovered that germination was hastened by the presence of ethanol. In a paper published by the British Mycological Society (Mycological Research III (2007) 1422-1430) entitled "Physiological studies of the warehouse staining fungus, *Baudoinia compniacensis*", Dr Scott and others reported that the fungus was able to utilize ethanol particularly well although it could also survive on simple sugars such as glucose. In a further paper published by the British Mycological Society (Mycological Research 112 (2008) 1373-1380) entitled "Ethanol physiology in the warehouse-staining

fungus, Baudoinia compniacensis", Dr Scott and others reported on their laboratory studies into the role of ethanol on cell germination and growth of the fungus. Their research concluded that lower levels of ethanol concentration provided the greatest stimulation for germination and growth of the fungus. A surprising finding was that growth of the fungus was suppressed at higher concentrations of ethanol. The report left open whether ethanol acted only as a carbon source for the fungus or whether it played a stimulatory role in colony establishment beyond being a carbon source.

[36] The role of ethanol in the germination of Baudoinia compniacensis was discussed in his evidence with reference to a book chapter prepared by him and Dr Summerbell in 2016 (Biology of Microfungi). Their conclusion was that Baudoinia compniacensis was able to metabolise a range of carbon sources including acetate, ethanol and glucose. Fungi secrete hydrolytic enzymes which reduce environmental materials into a form which can be ingested. The vast majority of fungi can use glucose if glucose can be extracted from environmental materials. But Dr Scott considered that the ability of this fungi to use ethanol set Baudoinia compniacensis apart from most fungi. His research demonstrated that growth increased with the concentration of ethanol up to an optimal point beyond which there was a sharp decrease. His conclusion was that ethanol primarily stimulated germination with growth thereafter being less affected. In response to a question in chief concerning the relationship of ethanol and other species of Baudoinia, he indicated that the experimentation previously reported was all in relation to a species now considered to be B. panamericana. He said there had been some limited testing on B. orientalis and B. caledoniensis which had not yet been published but they appeared to react to ethanol in a similar way. He noted that the pattern of colonisation close to ethanol sources appeared consistent throughout the

world regardless of the species of Baudoinia. It also had a similar appearance of darkly pigmented streaky patterns.

[37] His evidence was that Baudoinia was associated with locations where there was the "fugitive emission of ethanol vapour". The sources of Baudoinia were still unknown although he had not attempted a systematic or extensive search to understand the sources of this fungus. He was able to say that in the 25,000 specimens of material analysed by Sporometrics from the built environment, he had never identified Baudoinia other than where there was some exposure to ethanol emissions. He was asked about an article published in 2016 by Gomez-Cornelio et al which identified Baudoinia in a limestone building in Mexico where there was no local ethanol source. He was not aware of this study. He ventured the opinion that he would want to see ethanol measurements to confirm this as there were lots of natural sources of emissions of ethanol including fuel additives.

[38] Dr Scott had used both microscopy and DNA-based methods in relation to samples taken from Bonnybridge and elsewhere. He explained that when working with DNA based analysis, there had been issues with the functionality of the PCR primer which is designed to attach to gene residues. It is possible to get many false negatives using DNA analysis. DNA analysis also required the cell walls of the fungus to be broken down to release DNA and this could be difficult to achieve where the fungus had thick walls. He considered that microscopy provided a better method for identification of this fungus.

[39] Samples were taken from the pursuers' house, a lamp post and the communal playpark area on 26 July 2012. They were analysed by Sporometrics using PCR specific primers and Dr Scott signed off the analytical report on 30 August 2012. The report, which appears as an appendix to Professor Hawksworth's report dated 31 December 2012, included a positive result for B. compniacensis from the outdoor playhouse at the pursuers'

property. Negative results were obtained from two samples taken from an outdoor bathroom vent and an indoor sliding door at the pursuers' property. Positive results for Baudoinia were returned for samples from the communal play area and the lamp post.

[40] Further samples were collected by Dr Summerbell on 12 February 2013 from various properties in Bonnybridge including the pursuers' house. Sporometrics reported on these samples on 6 June 2013 after using PCR DNA sequencing techniques. Dr Scott signed off the analytical report. The five samples from the pursuers' property (taken from a vent, a fence, a side light fixture, a garden shed, and a back light fixture) tested positive for either Baudoinia panamericana or an unconfirmed Baudoinia ecotype. The sampling of other nearby properties in Bonnybridge, including the conservatory at 34 Corona Crescent, resulted in positive findings of Baudoinia on all but one sample.

[41] The next set of samples were taken by Dr Taylor in July 2021 on Dr Scott's instructions. These samples were initially sent to Jonah Ventures for DNA analysis. Dr Scott's own reports did not discuss the findings of Jonah Ventures. His recollection was that he was provided with a Jonah Ventures report at some stage but could not be certain when he had those results. In response to a question as to why, as an expert witness, he would not subsequently wish to inform the court whether the Jonah Ventures' DNA analysis was consistent or inconsistent with his microscopic conclusions, Dr Scott advised that he did not think the Jonah Ventures report was material to the question whether Baudoinia was physically present and growing in the samples. He considered that the Jonah Ventures findings supported his microscopic identifications "to some extent" but he did not discuss them in his report as they were irrelevant.

[42] The samples taken by Dr Taylor on 30 July 2021 were subsequently analysed by Dr Scott using microscopic analysis alone. These samples were taken from the side of the

house, a garden gate, a side garden fence, the back garden fence and the garden hut. Dr Taylor had also taken a sample from a lamppost in the street but Mr Jacques did not sample the lamppost. The reported results found filaments and conidia of Baudoinia in either abundant or occasional amounts. He explained that when carrying out the microscopic study, he is looking at 1 to 2 square millimetres of the surface. He explained that Baudoinia is only visible to the unaided human eye at around 2,000 cells. A collection of 2,000 cells of Baudoinia would be about the size of a pin head. The description of the fungus being "abundant" or "occasional" is based on a standardised formula, but it remains subjective. He considered that this microscopic examination confirmed the presence of Baudoinia. As these results were only analysed microscopically, it was not possible to say whether different species of Baudoinia were present.

[43] Dr Scott was pressed hard in cross-examination to concede that other species of fungi, such as capnodiales and aureobasidium pullans, can resemble Baudoinia under the microscope. As such, it was put to him that misidentification was likely and it was unsafe to rely on microscopy. Dr Scott made no concession. In evidence, he was shown diagrams of Baudoinia and aureobasidium pullulans, and he explained the differences which enabled those two fungi to be differentiated. He explained that spore production for aureobasidium pullulans was through filaments which could be identified, whereas Baudoinia engaged in thallic spore production by a process of fragmentation. He considered that there were resemblances with other fungi, but this did not mean that different species of fungi could not be differentiated. His evidence was that the unusual means of reproduction through fragmentation, its thick cell walls, cell orientation and darkly pigmented colour of the cell walls, enabled Baudoinia to be identified. He accepted that Baudoinia could be difficult to identify if the examiner did not understand its morphology, but he was confident that he

had the experience and skill to correctly identify Baudoinia. Dr Scott was taken through a series of photographs of the microscopic findings on the slides produced from samples taken by Dr Taylor and Mr Jacques in July 2021. He identified Baudoinia on each of the slides and explained his reasons for the identification. He identified Baudoinia on slides of samples taken from locations in which Professor Dentinger's DNA analysis suggested that no Baudoinia was present. He identified a fragment of Baudoinia on a photograph of a taped sample (S1-T) taken from the side of the house. Dr Scott agreed with Professor Dentinger that the raw data produced from this taped sample did not include any Baudoinia sequences. His explanation for this apparent anomaly was that he thought taped samples were particularly suited for microscopic analysis whereas DNA techniques could struggle to extract the individual particles from the adhesive tape.

[44] A considerable amount of time was spent at the proof in which Dr Scott commented on Professor Dentinger's DNA analysis of the samples taken in July 2021. Dr Scott considered that at least two of the locations sampled by Professor Dentinger revealed that about one half of the sequences obtained after filtration were attributable to Baudoinia. He accepted that Professor Dentinger's report found that Baudoinia was not detected on the house samples and that the most abundant fungi found were known to be dematiaceous (which means melanised) and so darkly pigmented. He accepted that Professor Dentinger identified Baudoinia in the painted iron gate samples and that other fungi which could be darkly pigmented were found in the samples.

[45] At the start of day 5 of the proof before answer, senior counsel for the pursuers advised that the pursuers' legal team had recently received a memory stick containing a more complete set of raw data from Professor Dentinger's DNA analysis of samples taken at the house. The data in the memory stick required to be read using specialist software.

It had only been possible to work through a 15-step process on the previous evening with Dr Scott to analyse the raw data. It was proposed that Dr Scott should work through that sequence of steps in court. The defenders opposed the use of this new material as they had only been informed on the previous evening of this. They did not have any further report from the pursuers which could have been considered with their own experts and on which further instructions could be taken. While the defenders did not anticipate this evidence being controversial if it only showed Baudoinia sequences at a very low level, they remained unclear what Dr Scott's further investigations purport to show. I allowed the pursuers to lead this evidence from Dr Scott in the form proposed but subject to certain safeguards.

[46] Dr Scott subsequently took the court through these 15 steps to further analyse the data produced by Professor Dentinger. He explained that fastq files are data files which come off the sequencer. Each individual result comprises four lines of text. One of those lines is a score which indicates the confidence which the sequencer has in relation to that result ranging from no confidence to very high confidence. To interrogate the results, Dr Scott converted sequences into a fasta file. The fasta file does not include the confidence rating. Dr Scott then converted the fasta files into a database. The files are extremely large so specialised software was used to render the database into a searchable form. Professor Dentinger had used five samples including three of known Baudoinia as control samples. A standard approach would be for the control samples to be mixed in equal proportions. The aim of the control samples is to test that the DNA sequencing is identifying Baudoinia in sufficient quantities to indicate that the test is working appropriately. When Dr Scott examined the results of the control samples, he found levels of Baudoinia which were about one tenth of what he expected. When he looked at the samples taken from the house and garden fence, he was able to confirm with high

confidence that Baudoinia sequences were present in all but one sample. On a worked example in court, he concluded that there were at least 21 sequences of Baudoinia compniacensis in the data obtained from the sample with the possibility of other sequences which would need to be checked further. He considered it very unlikely that the 21 matches could be false positives.

[47] He disagreed with Professor Dentinger's report which stated that Baudoinia was not detected in the samples taken from the wooden fence. Dr Scott's evidence was that sequences of Baudoinia were in these samples. However, he agreed that the majority of fungal sequences from the wooden fence were recurvomyces which is a darkly pigmented fungus. The other fungi detected in the sample included pigmented and unpigmented fungi. He also accepted that the garden shed samples included other forms of black fungi. His overall position with regard to the Dentinger report was that it was a well-researched report using widely accepted methods. He did disagree with its conclusions. In his rebuttal report, he had described Professor Dentinger's use of the data results as amounting to "pseudoscience". He explained that he meant that Professor Dentinger had drawn misleading conclusions from his results. His own conclusion from Professor Dentinger's results was that only one sample did not identify any Baudoinia. The shed and garden fence location had up to 50% Baudoinia in the samples and it was also present at lower levels in the other samples.

[48] Dr Scott gave his opinion on the development of blackening in which Baudoinia is implicated. For a blackening to develop, a spore required to land on a surface, germinate and then grow over a period of weeks. Discolouration would develop as the colony grew denser. Although a single species blackening is possible, it would be more likely that different organisms would join the colony. If bacterial presence contributing to the

blackening then it was likely to be cyanobacterial. He said that he did not disagree with Professor Hawksworth's report which, building on observations from the Watson et al report from 1984, concluded that where black moulds were found it was likely a mixture of fungi would be present. He agreed that there could be thousands of different organisms within a sample of black mould. He accepted that the DNA analysis of samples from the pursuers' property had revealed a number of organisms of which a subset was darkly pigmented.

[49] There were two potential models as to what occurred to Baudoinia on a surface after further organisms join. One possibility is that the Baudoinia remains sufficiently populous that it contributes to the visual discolouration along with other organisms. The second possibility is that, over time, the Baudoinia is completely displaced and the successor organisms remain. He said that he would not favour one possibility over the other. On being asked whether it followed that there was a wide variation in organisms contributing to the visual blackening, his response was that many of the other species found were lightly pigmented or not pigmented. He accepted that if the second hypothesis was correct - namely that Baudoinia was displaced over time - it had to follow that the other organisms which were on the building were darkly pigmented.

[50] He was unable to say how Baudoinia arrived on any surface. He doubted that it was an airborne fungus and appeared to favour it being carried by another organism. This was an assumption. He considered that Baudoinia would colonise a surface at an early stage. It would be a "first coloniser". He explained that surfaces are constantly bombarded with different particles from the environment but some will be able to colonise the surface before others. He considered that Baudoinia attached, germinated and starts to grow before other organisms. Other fungi and organisms will follow on that surface once Baudoinia has

established itself. His "sense of this" was that, absent the first colonisation by Baudoinia, the blackening event would not occur at the pursuers' property. He spoke of panel studies being carried out in which new panels of vinyl, glass or wood are exposed to a nearby ethanol source. These panels were examined at intervals and within 3-4 months it was possible to identify Baudoinia which over time become microcolonies, and within 2-3 years showed black staining. Fungi which were parasitic on other fungi appeared and he considered that was because the Baudoinia had created a habitat in which other fungi and micro-organisms could flourish. He expressed the view that evidence from these field studies was now sufficient to consolidate into a study for publication and peer review. There was no currently published literature on this "first coloniser" theory for Baudoinia. He agreed in cross-examination, that the "first coloniser" theory required further study and had not been addressed fully to his satisfaction. He accepted that "first coloniser" theory was not something discussed in any of his published research. He observed that a number of years ago, he had been in discussion with Andrew Whiteley from the Scottish Whisky Association who was interested in an experiment to investigate "first coloniser" theory but there had been no subsequent publication from that work. The defenders took objection to the line of evidence relating to field studies for "first coloniser" theory on the basis of lack of notice.

[51] He accepted that many unresolved issues remained in relation to Baudoinia including the question of health effects; the mechanism whereby Baudoinia interacts with ethanol; and the role of ethanol in germination and colonisation in dynamic conditions where temperature and humidities change. No time course field studies had been carried out to investigate whether Baudoinia operated differently in environments near bonded warehouses than other environments. He acknowledged that while his own studies had

called for further investigation, others had not taken up that challenge. There was a lack of funding for such research. Despite uncertainties as to how ethanol interacted with Baudoinia, he did not consider this called into question the relationship between them. He said that the "exposure and response" was clear, but the mechanism was not.

[52] He was shown various photographs taken by Alastair Wood. Dr Scott accepted that there were similarities between the blackening shown on the photo (6/13) of the back of the pursuers' house and some of the discolouration seen on the photos taken by Mr Wood. He did not consider them perfectly comparable, but they were similar. Blackening could occur from many organisms other than Baudoinia including lyngbya gloecapsa which is a type of cyanobacteria. The characteristic pattern associated with Baudoinia staining was black crumbly streaking particularly in sun exposed areas. The blackening tends to be quite adherent to the surface.

Dr Richard Summerbell

[53] Dr Summerbell co-authored three reports with Dr Scott and also prepared one report in his sole name. His oral evidence concentrated on the sole report, but he confirmed that the joint reports reflected his own professional opinion. Dr Summerbell has been the research director at Sporometrics Inc since 2007. Since 2009 he has been an associate professor at Dalla Lana School of Public Health at the University of Toronto which is a part-time role. His career has included working as a medical mycologist for the Ministry of Health in Ontario prior to being the chief mycologist of that body. From 2000-2006, he worked as a senior scientist and then group leader within a prestigious mycological institute now known as the Westerdijk Institute in the Netherlands.

[54] His first involvement with Baudoinia was in 2006 when he went to the Cognac region of France to collect samples. He described seeing a distinctive plume of dark material on farmhouses in Cognac where small-scale production of the spirit took place. He had also seen blackening of signs, trees and houses on the leeward side of storage warehouses operated by Hiram Walker in Canada over 0.5-1 kilometres from the warehouses.

[55] Dr Summerbell visited Bonnybridge in February 2013 and collected samples from several locations. The defenders were present when samples were taken. He described seeing blackened shrubs and trees in the nature reserve close to the pursuers' house. He saw blackening on some of the houses. He described seeing trails through the blackened material which was distinctive of snails or slugs grazing on the material. He saw dark patches on cars which were unusual. He took photographs including photographs of Mrs Michie's conservatory at 34 Corona Crescent. He considered that the blackening on the metal and glass of the gazebo was remarkable.

[56] He described Baudoinia blackening as being distinctive. It is almost always outdoors. It becomes heavy and occluded if not cleaned. It has a powdery texture and looks sooty. It becomes less prevalent the further away from an alcohol source.

[57] Dr Summerbell spoke to a photograph which showed a zig-zag pattern traversing a wooden slat on the pursuers' property. The zig-zag trail was a snail trail whereby the snail has consumed organic material from the surface of the wood. A further photograph showed a similar zig-zag pattern through blackening on a painted windowsill at Bonnybridge. He also spoke to a photograph of a glass table which was blackened which he considered was extremely unusual. Photographs of blackening of trees and shrubs in the parkland, and of a garden shed, were also spoken to but the blackening was less obvious.

[58] In terms of identifying Baudoinia as compared to other fungi such as aureobasidium pullulans, Dr Summerbell's evidence was that it was relatively easy for a trained mycologist who was familiar with the research papers published on Baudoinia. He would be wary of amateur mycologists claiming to identify Baudoinia. In this regard he referenced a report cited by Professor Eastwood in which Baudoinia was said to have been isolated in a limestone wall in Mexico. In cross-examination he was asked about an affidavit which he signed on 15 November 2013 in relation to proceedings in Vermont in which he stated that other dark fungi such as aureobasidium were not microscopically distinguishable from Baudoinia cells and that absence of Baudoinia cells could only be established by a DNA based test. He explained that the affidavit had been made within a local environmental hearing which was considering, among other things, whether a local technician could identify Baudoinia at a local distillery. The affidavit was aimed at an audience without expertise in fungi and sought to explain that there was scope for confusion with other fungi and that the safest way to confirm presence was via DNA testing.

[59] He had reviewed the findings from Dr Scott's 2022 microscopic analysis although their joint report did not state that in terms. They were not asked to carry out DNA sequencing on the samples. He had seen an Excel spreadsheet which included the DNA sequences produced by Jonah Ventures on those samples. He said that the 2022 rebuttal report did not address the Jonah Ventures material as they were not asked to do so.
In response to a question as to what significance the Jonah Ventures results had for any potential rebuttal report, Dr Summerbell said that the Jonah Ventures report had many of the pitfalls which he considered Professor Dentinger's report also had. He considered that DNA analysis gave a large number of superfluous positives for organisms which likely played no part in the blackening. He considered that DNA analysis likely underestimated

the amount of Baudoinia. He was asked whether the results of the Jonah Ventures analysis contradicted their microscopic conclusions. His response was that there was no mystery about what he and Dr Scott thought of the Jonah Ventures report because they had commented on it in their 2025 report. However, the 2025 report lodged with the court contained no discussion of the Jonah Ventures results. When that was explained to Dr Summerbell, he remarked that the Jonah Ventures study was done using the same methods and techniques as the Dentinger report and that the only difference was that Jonah Ventures disclosed more data (notably a list of non-pigmented fungi present) than Professor Dentinger had included.

[60] Dr Summerbell was also shown photographs taken by Alastair Wood including one at Lennox Court, Kilsyth which had blackening which he described as "similar" to that seen at the pursuers' house. Photographs of blackening at Cruikshank Court were also agreed to be similar to the pursuers' property. He described Baudoinia as quite quick to grow and being found in many areas (not simply areas of shade or moisture).

[61] In relation to the first coloniser theory, Dr Summerbell confirmed that Baudoinia likely colonise a surface before other organisms overgrow on top of it. Once present, the water retention capacity of the surface enables other fungi and fungus eating arthropods to become established. It was, in his view, unclear whether the sub-stratum of Baudoinia is eliminated by the presence of other organisms or whether it remains in place as a sub-stratum. He said that the answer might depend on the underlying material (ie metal or wood or stone) since the overgrown organisms might struggle to survive on some materials without a layer of organic Baudoinia. He thought it possible that Baudoinia could condition surfaces such as wood, and possibly stone, which enabled other organisms to take hold even if the Baudoinia was removed. He acknowledged that there had been no scientific study on

whether Baudoinia did, in fact, have the ability to secrete acid which might condition the surface of stone to the benefit of other organisms. He qualified the reference in his joint report to Baudoinia being "swallowed up" by other organisms by saying that if that was understood to mean "elimination" of Baudoinia then it would not apply to impervious substrates since the other organisms would likely fall away if the Baudoinia was removed.

Professor David Hawksworth

[62] Professor Hawksworth prepared three reports referred to in evidence dated 31 December 2012, 9 May 2023 and 16 January 2025. Professor Hawksworth has been a working mycologist since 1969 after completion of his PhD. He received the Fellows Medal of the International Mycological Association in 2018 and a CBE for services to science. He was a director of the International Mycological Institute for 14 years. He was the first chair of the International Commission on the Taxonomy of Fungi which seeks to bring international consistency to the description and naming of fungi. Professor Hawksworth has considerable experience as an expert witness in the criminal, civil and coroner's courts in England.

[63] The most common cause of blackening on buildings is black lichen from the verrucaria nigrescens and verrucaria viridula groups. Other than one report in relation to a plastics factory, he was only aware of blackening from Baudoinia being found at maturation warehouses. He described a social visit to a distillery in Fettercairn in 2013 in which an information sheet referred to the black growths at the distillery as being Torula compniacensis (the 19th century name) which lived off the angel's share. He described the blackening at that distillery as looking "sooty" and "sort of felted black growths".

[64] Professor Hawksworth explained that some organisms grow better when exposed to particular emissions. By way of example, in the 1960's and 1970's, the mapping of lichen patterns suggested a possible link with the emission of sulphur dioxide. Subsequent laboratory studies confirmed that sulphur dioxide did aid the establishment of lichen. He drew a parallel with Baudoinia. Observational studies linked the presence of Baudoinia blackening to ethanol emissions and this was confirmed by laboratory studies carried out by Dr Scott and others.

[65] In 1984, Watson published a report which noted the frequent occurrence of dark stains on the exteriors of bonded distillery warehouses in Scotland. Watson collaborated with Professor Hawksworth's staff for this report. Watson observed that areas of visible growth coincided with the direction of the prevailing wind. He agreed that Baudoinia was not known to present any hazard to human health.

[66] His 2012 report recommended a further study to test whether there was a causal link between the ethanol vapour and the blackening. He recommended against studies of air spora or of ethanol levels as he considered the results would likely be equivocal and not sufficiently robust. He explained that the air spora and ethanol levels would vary hour by hour depending on wind directions. This was based on his own understanding of how gases perform in the atmosphere due to his previous involvement in various air pollution studies. He was not aware of technology which could measure air borne substances at different points on a continuous basis. His 2012 report recommended mapping the extent of the area with ethanol associated fungal growth by reference to the position of the bonded warehouse and wind direction. In terms of sampling, he said it was preferrable to sample from a surface as opposed to from an air sample. He recommended use of adhesive tape on the growth which could be transferred directly to a sterile slide. Dr Taylor took

these samples in 2022. He was subsequently involved in checking the microscopic slides prepared by Dr Taylor to confirm that Baudoinia had been correctly identified. He was satisfied that she had correctly identified Baudoinia on various slides. He also found Baudoinia on some slides she had reported as being negative. This occurred as the methodology adopted by Dr Taylor resulted in Baudoinia being missed on parts of the slide which were not analysed by Dr Taylor in accordance with the randomised area selected for analysis. Dr Taylor's analysis demonstrated that the areas with greater levels of Baudoinia were downwind of the prevailing wind, i.e. to the north-east of the bonded warehouse. He noted that the defenders had duplicate samples of those taken by Dr Taylor in 2022 but had not reported on whether they had analysed those samples or the results of such analysis.

[67] He considered that a specialist mycologist who had looked at the literature and reference material would be able to confidently identify Baudoinia under a microscope. He considered that some features of Baudoinia were particularly distinctive under a microscope. He disagreed with Dr Pringle's opinion that aureobasidium pullulans might be confused with Baudoinia. With reference to drawings of those two fungi from Seifert et al "The Genera of Hyphomycetes", Professor Hawksworth expressed the opinion that microscopically they were very different and distinguishable. With reference to an image showing both Baudoinia and cladosporium on a microscopic slide, he also indicated that they could be distinguished. There were superficial similarities, but careful study had allowed Baudoinia to be identified as a discrete fungus. In cross-examination he said he would not class Dr Summerbell as experienced in working with this group of fungus. In re-examination, he identified Baudoinia in two of the images contained in Dr Scott's 2022 report. His conclusion was that the mould growths sampled from the pursuers' property and analysed microscopically by Dr Scott had correctly identified the presence of

Baudoinia. His evidence was that the Baudoinia could reasonably be attributable to ethanol vapour dispersed from the defenders' warehouse.

[68] He was asked to comment on the advantages or disadvantages of DNA testing of samples. The DNA approach generates a lot of data and gives positives for all sorts of fungi but it does not mean that the fungi is growing. He was surprised that the defenders had focussed exclusively on molecular analysis of the samples taken in July 2021 without seeking to analyse Dr Taylor's samples taken in 2022 or the result of her pipe experiment in 2024. Nor had the defenders explored the use of a Baudoinia specific fluorescent method of detection which had been developed in Glasgow. He considered that a negative DNA finding should be followed by a microscopic examination as studies had shown that it could be difficult to get DNA from sooty moulds. Baudoinia is a thick-walled fungus in which the DNA is within a tube behind the thick walls. Professor Hawksworth had been involved with research in which different groups had struggled to extract DNA from fungi for taxonomy purposes. He did not consider that DNA analysis could reliably indicate the abundance of a species in a sample. He considered that DNA techniques were very helpful for identification of a single isolated organism but less helpful in interpreting a sample with numerous organisms.

[69] He noted that Dr Scott had subsequently identified five different species of Baudoinia in 2016 although they were morphologically indistinguishable. Assigning a separate species label to each type was a subjective decision. There were no clear rules at the time. Professor Hawksworth was doubtful whether this sub-division into five different species would have taken place under current guidance. He was not convinced that sufficient variation was present within the five species including their geographical distribution. It now appeared that the original geographical distinctions signalled by the species names

were not as distinct as originally thought. There was, as yet, no evidence that the five species differed in their ecological behaviour. It was also now known that there were variations within the ITS region of a single isolate's DNA. He said that the sub-division of Baudoinia into five species was a human construct. Professor Hawksworth warned that care needed to be taken as to the emphasis placed on the fact that different scientific names had been ascribed. He did not agree with the proposition put in cross-examination that it was invalid to assume that all five species would act in the same way to the presence of ethanol. He considered it a reasonable assumption that they would act in a similar way, as each species had been discovered in sites close to ethanol and there was no evidence to suggest that they acted differently in nature or in laboratory studies. He confirmed that there are no published scientific papers which challenge the findings of Drs Scott and Summerbell in relation to Baudoinia.

[70] Professor Hawksworth's evidence was that a dense colony of Baudoinia created an environment in which other fungi could grow. This was in part due to the increased water retention on the surface. In addition, the colony would trap further spores. He considered that Baudoinia could be considered a species able to colonise a fresh surface and this was confirmed, in his view, by Dr Taylor's pipe experiment. He did not accept that the pipe experiment was flawed through lack of replication or an inadequate control. He viewed the repeated tapings taken at intervals to be a form of replication. He agreed that the replication of results by repeated experiments supported the robustness of those conclusions. He did not consider that the presence of a control site was significant to the study which, in his view, demonstrated that Baudoinia acted as a pioneer to colonise the drainpipe over a short period of time. He was critical of the defenders for not carrying out their own experiment to test for colonisation.

Chris Highton

[71] Mr Highton is a valuation surveyor engaged on behalf of the pursuers. Mr Highton spoke to his three reports dated 10 May 2021, 1 October 2024 and 10 January 2025 which he adopted as his evidence. In summary, his final report concluded that 42 Woodlea Gardens was valued at £285,000 as at 1 October 2024 which was £25,000 less than if the property did not suffer from repeated discolouration.

[72] Significant difficulties emerged during cross-examination of Mr Highton. It became apparent that he had not seen a report by Mr Collings which had critiqued Mr Highton's original report. He accepted in cross-examination that his first report had failed to explain the adjustments which he had made to his valuation figures and that he had undervalued the pursuers' property. He conceded that differences in value between Woodlea Estate and other comparable housing estates could be explained on the basis of location, condition and style of house rather than proximity to the warehouses. He also agreed that the "days to sale" data produced by Mr Collings demonstrated that there was high demand for Woodlea Gardens properties. These concessions were relevant to his final report. He was invited by senior counsel for the defenders to withdraw his support for his reports and he did so. In the light of the concessions made by Mr Highton, there was no evidential basis advanced by the pursuers to support a claim for diminution in value. It is unnecessary in these circumstances to summarise his evidence in any more detail.

Graham Page

[73] Graham Page lives at 52 Woodlea Gardens, Bonnybridge. He purchased his house in 2002 from the developer. He had previously lived in Laurel Grove in Bonnybridge which

was not as close to the bonded warehouses as his current address. He thought that Laurel Grove had been about 600 metres from the warehouses. He had not been aware of any blackening at his former address.

[74] He first became aware of blackening at his current address in around summer 2003 when he noticed black spots on the white window frames of his conservatory. He would deal with the blackening by using either a power washer or bleach to remove it. This would involve cleaning the patio, soffit, drainpipes, windowsills and walls. He would normally pay someone to clean the two lower roofs. He would do this after each winter and, in some years, also later in the year. He paid someone to do the walls of the house approximately once every 2 years. The terracotta roof tiles on his house are now very dark. His cars have also been affected by blackening, principally on the roof of the car. He has changed to a dark paint on his garden fence which camouflages the blackening. Attached to his written statement were photographs of receipts for cleaning of the roof, roughcast and gutters in 2019 (£170); 2021 (£200); and 2023 (£280). A receipt from 2024 for the cleaning of gutters and soffits was for £120.

[75] Mr Page confirmed that the Health Protection Report by McRae and House in March 2006 had taken samples from his property.

Defenders' witnesses

Professor Bryn Dentinger

[76] Professor Dentinger is an associate professor at the University of Utah and a curator of mycology at the Natural History Museum in Utah. His post-doctoral research has been in the field of mycology, and he spent 6 years working at the Royal Botanic Gardens in Kew, London latterly as the head of mycology. He prepared three reports dated 2 May 2022,

5 December 2024 and 17 January 2025. He also prepared some documents to update appendices from his second report.

[77] He had a particular involvement in the early use of molecular methods of identifying fungi from environmental samples. Metagenomics is the study of all genomic content of a sample, usually a sample taken from the environment composed of various organisms. The development of metagenomics techniques has allowed the simultaneous sequencing of the DNA of numerous organisms. Typically, this involves metabarcoding which focusses on a specific region of the genome rather than the entire genome. The DNA barcode which scientists have determined works best for species level identification is the Internal Transcribed Spacer (ITS) region. Metabarcoding is a term used alongside amplicon sequencing since one of the steps in the analysis involves amplifying the copies of the DNA barcode region. An alternative approach is referred to as shotgun metagenomics. Instead of targeting a pre-selected region, this technique takes all the DNA in a sample and seeks to break it down into smaller pieces which are then sequenced.

[78] The scope of his instruction was to analyse samples for Baudoinia; comment on the techniques for identifying species of fungi; and to offer his opinion on the "first coloniser" or "pioneer" theory. His own analysis used a combination of metabarcoding and shotgun metagenomics which, in his opinion, gave the most comprehensive view of what was in samples.

[79] The May 2022 report analysed the samples taken in July 2021. His instructions were to analyse and report on whether Baudoinia compniacensis was present in the samples. He was not instructed to report on the presence of any other species of Baudoinia. His second report instructed him to report on the presence of all fungi species within the genus Baudoinia. This second report involved re-analysing the data produced at the time of the

first report. Professor Dentinger did use a positive control in 2024 which involved the use of a sample of reference material to see whether it could be recovered by the analytical techniques as anticipated. The positive control of Baudoinia spores and hyphae were detected which confirmed to Professor Dentinger's satisfaction that his technique was capable of detecting Baudoinia in a mixed environmental sample. The further positive control exercise in 2024 also involved repeated testing of samples from sites A and E of the pursuers' property. A significant advantage which Professor Dentinger put forward for his technical analysis, when compared with that by Sporometrics, was that his results gave an assessment of both presence and abundance of Baudoinia in a sample. Sporometrics only gave a result on presence. By abundance, Professor Dentinger was referring to the relative biomass (number of cells) of Baudoinia compared with other organisms. There is a degree of imprecision in assessing the abundance of any individual organism, but Professor Dentinger consider that, overall, his approach provided a reasonable measure of abundance.

[80] Professor Dentinger explained that during the barcoding (amplicon) analysis, it is necessary to apply a filter to the "raw reads" to remove errors. This process results in a subset of "reads passing the filter". He explained that following further information from the pursuers' experts, he had reviewed his data and realised that a line of code had the effect that more reads were being filtered than originally intended. He corrected this error and re-analysed the data which resulted in a different number of sequences passing the filter and an increased percentage of Baudoinia detected in his samples. A revised version of his appendix 4 which corrected for this code error had been lodged in process. A truncated copy of his amended appendix 4 is set out below:

Sample location	Sample type	Sample ID	Reads passing filter	Minimum no. of species	Percentage of fungi being Baudoinia
House	blade	A	41,312	61	0
House	toothbrush	S1-BR	23,341	53	0
House	tape	S1-T	0	0	n/a
Painted iron gate	blade	B	43,353	201	16
Painted iron gate	blade	S2-BL	34,278	50	80
Painted iron gate	tape	S2-T	19,391	109	29
Wooden fence	blade	C	78,643	71	0
Wooden fence	blade	S3-BL	34,754	65	0
Wooden fence	tape	S3-T	38,645	55	0
Wooden fence	blade	D	119,795	142	0
Wooden fence	blade	S4-BL	32,218	60	0
Wooden fence	tape	S4-T	24,276	70	0
Wooden shed	blade	E	50,982	252	41
Wooden shed	Blade	E-2	27,672	186	44
Wooden shed	Blade	S5-BL	19,176	101	49
Wooden shed	Tape	S5-T	24,258	147	45

[81] Professor Dentinger adopted a practice of only reporting on organisms which exceeded 1% of the total reads. He considered that reads of less than 1% were unlikely to be reliable. For transparency, his amended appendix 4 noted that the samples A and S1-BR from the house did have a few sequences corresponding to Baudoinia of 0.02% and 0.03% respectively. From sample A, this was about ten sequences out of 41,312. He considered that these very low levels of sequences were consistent with technical artefacts and could not be assumed to accurately record Baudoinia. A technical artefact is a byproduct of the testing technology.

[82] His conclusion was that Baudoinia was present on the wooden shed and painted iron gate of the pursuers' property but that this fungus is rarely dominant in the samples analysed. He had seen no evidence that Baudoinia appeared on the house itself.

The fungi which he detected from the house samples were all darkly pigmented fungi and included teratosphaeriaceae (45%), cladosporium (7%) and devriesia (7%). Other fungi found within the samples taken from the property were darkly pigmented. He considered that any Baudoinia present in the samples contributed little to the perceived blackening.

[83] He was taken through Dr Scott's re-working of the DNA raw data. He explained that barcoding results in forward and backward reads of sections of the genome. In order to accurately identify a section of ITS as relating to Baudoinia, it is necessary to use paired or merged forward and backward reads. The "reads passing the filter" in his own results were all merged results. He was critical of Dr Scott's failure to use merged forward and backward reads when re-analysing the data. A single read would not necessarily cover the whole of the barcode. This likely resulted in unreliable reads and inflated the number of reads attributed to Baudoinia. Chimera could be encountered whereby a forward read corresponds to one species but the reverse read corresponds to a different species. Ultimately, in cross-examination, he agreed that both Dr Scott and he were reporting low levels of Baudoinia sequences in sample A from the house albeit that he considered that the reading was so low as to be unreliable.

[84] He confirmed that Baudoinia is a genus of darkly pigmented fungi in which there are five recognised species. It was not possible to differentiate between the known species microscopically, but they could be differentiated on DNA analysis. In his opinion, it had not been scientifically established that all species grew using ethanol as a carbon source. Dr Scott's laboratory studies using ethanol had used a single species, namely Baudoinia panamericana. His DNA analysis demonstrated that Baudoinia panamericana is not present on the pursuers' property.

[85] Professor Dentinger was critical of Dr Taylor's pipe experiment. He considered that an agreed upon design was an important step to avoid unconscious bias in setting up the experiment. Her experiment lacked the minimum standards required for objectivity, transparency and reproducibility. There were inadequate controls. The presence of ethanol was not measured at the two sites. There should have been air sampling of ethanol at the different sites. He was critical of the random number generation used by Dr Taylor for the selection of the parts of the slides to analyse for presence/absence of Baudoinia. In his view, the randomised number ought to have been used for each slide. The pipe experiment required to incorporate random placement of the pipework to be scientifically robust. The precise type of the plastic pipework had not been clarified. Dr Taylor's previous report in 2022 had noted the importance of the substrate being tested. There had been no previous testing of plastic on the pursuers' property so it made no sense to use plastic only for this further experiment. Plastics are carbon based and it is known that carbon molecules can be an energy source for fungi. At most, her drainpipe experiment demonstrated the presence of Baudoinia, but it did not demonstrate growth of Baudoinia nor that it operated as a first coloniser.

[86] He was also critical of Dr Taylor's sampling techniques notably the use of a brush and tape. He accepted in cross-examination that Professor Hawksworth had referred to a British Standard for indoor sampling of moulds which recommended that tape was used for sampling. He considered that the pursuers' sampling exercises failed to meet standards for scientific integrity with the consequences that the results could not be relied upon.

[87] In relation to the "first coloniser" hypothesis, Professor Dentinger acknowledged that a habitat can be colonised by a pioneer organism which then makes the habitat more habitable for other species ("conditioning"). There is the potential for the original pioneer

organism to be succeeded by the subsequent organisms. However, there had been no studies to test the application of this theory for Baudoinia in this type of environment. There is no scientific data to support or refute the "first coloniser" theory for Baudoinia. In his opinion, it was more correct to describe this as a hypothesis rather than a scientific theory.

[88] He confirmed in cross-examination that he was not aware that the defenders had also taken samples in 2013. He had been aware that further samples taken by Dr Taylor in 2022 were shared with the defenders, but he was not asked, and he did not request, to examine them. He did not take a sample from Dr Taylor's drainpipe experiment to test for DNA. He was taken to photos of fungus identified by Dr Taylor and Dr Scott as Baudoinia in their respective reports. In cross-examination, his consistent position was that the pursuers' experts could not reliably identify the genus Baudoinia by microscopy. They could be mistaken as many fungi have yet to be identified. He accepted that the photographs from the pursuers' expert reports were similar to Baudoinia but was unwilling to commit that it was Baudoinia. He accepted that the shotgun data had not been produced and could not be interrogated. He also accepted that the positive controls have limitations since he cannot know how much Baudoinia was in the control and cannot be certain that his method was biased for or against identification of Baudoinia.

[89] The pursuers sought to make a point in cross-examination about Professor Dentinger's 2022 report. His 2022 report had been seeking to identify the Baudoinia compniacensis species alone. Amplicon sequencing identified 0.7%, 2.99% and 1.71% of this species in the three samples taken from the garden gate. The 2022 report then went on to discuss the "other fungi" found in the samples and listed 7 of the 10 other fungi which were said to be darkly pigmented. The report did not explain that included in these "other fungi" were other Baudoinia species. It was put to him in cross-examination

that he had taken a deliberate decision not to list the other Baudoinia species as being present in the samples in 2022 and had instead chosen to identify other non-Baudoinia fungi which appeared in less abundance. Professor Dentinger agreed that he decided what to report but his position was that he was only asked to report on the presence of Baudoinia compniacensis and that his decision to list other non-Baudoinia fungi was to demonstrate the diversity of the fungi in these samples. He referred to another section of the same report in which Baudoinia was included in a general list of other fungi found in the samples.

Dr Anne Pringle

[90] Dr Pringle is a professor in the Department of Botany and Bacteriology in the University of Wisconsin-Madison. She has served as the president of the Mycological Society of America. She prepared three reports dated 6 May 2022, 4 December 2024 and 17 January 2025. The first report from May 2022 had been superseded by her report in December 2024. She had not been instructed to carry out any experimental work in relation to the issues in this litigation. Nor did she collect any data beyond taking some photographs on her site visit. She confirmed in cross-examination that she had never looked at Baudoinia in a culture. Insofar as looking at Baudoinia in nature, she had seen blackening in the present case which Professor Dentinger subsequently identified as including Baudoinia. She was unaware that the defenders had been provided with samples from the 2013 or 2022 sampling exercises, and she had not been asked to look at samples taken at those times.

[91] Dr Pringle provided a critique of the literature relied upon by the pursuers' experts. The published laboratory experiments were based on three strains of a single species, Baudoinia panamericana. That species has not been identified at Bonnybridge.

The laboratory studies have not been extended to demonstrate the effect of ethanol on other species of Baudoinia. The pursuers' experts were making an assumption that other species would react in the same way, but there was no scientific basis to support such an assumption. The evidence from the limited laboratory experiments was that different strains behaved differently to each other in relation to ethanol utilisation.

[92] The 2007 studies, which had many limitations, indicated that Baudoinia could utilise glucose as a carbon source which Dr Scott had confirmed would be expected. In her opinion, the cause and effect between ethanol and the genus Baudoinia in the natural environment remained an untested hypothesis. There were no ethanol measurements for the locality although she accepted that she was unaware of whether it was feasible to do such testing. Drs Scott and Summerbell surmised that the interaction of ethanol and dew was important, but this was speculative and had not been tested experimentally.

The laboratory data does not consider Baudoinia growth in the context of dew. She expressed the view that it would be straightforward for dew to be collected from the pursuers' property to measure ethanol levels. Without such an experiment, the pursuers' experts' emphasis on dew and ethanol was an untested hypothesis.

[93] Nor had Dr Scott's laboratory experiments been confirmed by repetition by others. Good science requires results to be confirmed by replication to confirm the robustness of the original research. Further studies to confirm the robustness of the initial study had not been carried out. Replication of results by different researchers at different laboratories can confirm that the results are not influenced by local conditions. She explained that laboratory tests on cultured Baudoinia had inherent limitations. A cultured species had, by definition, not interacted with other organisms and diseases which it would be exposed to in nature. Care needed to be taken from drawing conclusions from a laboratory study as to how the

fungus would fare in the environment. Further, in this case, the research carried out was extremely limited. The studies used a few strains of Baudoinia panamericana. The strains of Baudoinia which were tested all germinated and grew with glucose as its carbon source. There was germination in the control which was ethanol free. Having reviewed the research published by Scott and others, her opinion was that it was not proved that Baudoinia required an ethanol source for germination or growth.

[94] Dr Pringle drew attention to some aspects of the 2008 study by Dr Scott and others. The different strains tested reacted differently to the presence of different concentrations of ethanol. One strain did not demonstrate a dramatic difference in biomass depending on the different ethanol levels. Another strain, which showed declining biomass as ethanol concentrations increased, did not have data for ethanol concentrations from 0 mM to just below 50 mM so no conclusions could be drawn. A simple conclusion such as "Baudoinia growth is stimulated by alcohol" is incorrect as the growth of the strains decrease as ethanol concentrations increase. Dr Pringle was not cross-examined in relation to her criticisms of this study.

[95] There remained much which was unknown about the physiology and ecology of Baudoinia. She gave, as an example, it's mode of dispersal. She explained that in 2016, Drs Scott and Summerbell had published an article suggesting that dispersal was via the digestive tract of snails, but that the rebuttal report in the present case had suggested airborne dispersal. It's interaction with other species was not understood. Until further research answered some of the issues which she had identified, and there had been replication of Scott et al's research results, she considered that the claims made in the litigation remained hypotheses rather than proven scientific fact.

[96] She explained that blackening on buildings is ubiquitous and likely comprises a wide range of fungi and other organisms. While some species may be commonly present in many blackenings, it is also probable that there will be other unique species within them. The causes of the blackening of buildings will be various and there has been limited scientific research into this topic. Her report dated 4 December 2024 included photos which she had taken of the gable wall of a house in Kilsyth and the front of a house close to the pursuers' house in Bonnybridge. Her evidence was that the generalised darkening of the roughcast was similar on both buildings including the fact that the darkening started at a point well below the roof line.

[97] The best approach to identify what is in any blackening is through DNA analysis. If the question which the researcher wanted to answer was whether a particular species was present in a blackening, then a PCR would be used. A PCR approach can be configured by reference to a single species to provide a yes or no answer to whether that species is present in the blackening. But a PCR metabarcoding approach can also be used in which the DNA of all species within the sample are identified by reference to a single gene known as the Internal Transcribed Spacer (ITS). In her view, a microscopic approach to the blackening had many limitations. It was not an approach well equipped to identify the diversity of the different species within a blackening. Based on the literature which described Baudoinia as "morphologically indistinct", there was scope for even skilled mycologists to wrongly identify another fungus as Baudoinia. But she deprecated any "battle" between adherents of microscopy and adherents of DNA techniques describing this as a "false choice". Depending on the circumstances, both techniques may be of use. In some investigations, a molecular approach is preferable. She did not accept that microscopy could be a helpful way to check if Professor Dentinger's finding of 0.02% of Baudoinia was an accurate finding

or a technical artefact. In her experience, it went the other way with molecular analysis being used to confirm a microscopic opinion.

[98] In cross-examination, she accepted that DNA analysis is not foolproof and that errors can result in false negatives and false positives, but she said that a well-designed study with adequate protocols and controls should minimise that risk. In this case, she had reviewed the DNA analysis of Professor Dentinger and considered that it had been properly carried out with appropriate controls in place. She did not have the raw data from Professor Dentinger to analyse independently. She acknowledged that Professor Dentinger's analysis will identify DNA from both living and dormant spores. She considered that the majority of the DNA would be from living spores since exposed dead DNA will not survive long in the environment. But, in any event, whether an organism was living or not, it could still contribute to the blackening, so its identification was important. Professor Dentinger's analysis enabled a conclusion to be drawn as to the various materials contained in a single blackening.

[99] She described how the development of DNA barcoding had opened the scientific community's eyes to the sheer diversity of microbial communities. The makeup of a microbial community will also be influenced by the substrate since different organisms will thrive on and in different substrates. In cross-examination, she volunteered that she did observe a specific black growth on trees immediately adjacent to the chain link fence at the bonded warehouse but had not reproduced photographs of that in her reports. She recalled seeing some trees with blackening similar to those found by Dr Taylor in her report. She disagreed with senior counsel for the pursuers that it would have been more relevant to report on and discuss discoloration of trees in the nature reserve rather than reproducing photographs of blackening on buildings in Edinburgh. She accepted that photographs from

in and around the Woodlea Estate showed blackening on different parts of houses, garden furniture, cars and swings, but she did not accept that the cause of the blackening was identical. Her conclusion was that there was no consistent finding of Baudoinia in the blackening on the pursuers' property.

[100] Dr Pringle was unaware of any published literature which demonstrated that Baudoinia acted as a "first coloniser" organism. She had first heard of such a claim in the present litigation. Fungal succession is an important concept which has been extensively studied. She understood the pursuers' contention to be that Baudoinia acts as a pioneer with primary effect. It arrives at the habitat and is able to change the habitat so that other organisms can follow. In her opinion, there was no data produced to support that theory in this case. She was referred to a slide contained in Dr Scott's rebuttal report which was said to show the growth of algae above Baudoinia on a roof at St Croix. Dr Pringle was dismissive of the single slide which she considered to be unclear and insufficient to draw any conclusions from. She said that there were well established methods to study succession, but this had not been done. Any such study should consider different substrates. The study should harvest the samples at different time points, and the analysis should look for fungi and bacteria especially photosynthesising organisms. She had not suggested to the defenders to do their own study.

[101] Dr Taylor's pipe experiment was not sufficiently rigorous due to the lack of controls. There was no replication and she had not taken measurements of ethanol at the two sites. Her study differed from that originally outlined by her. Her understanding was that Dr Taylor had only looked for Baudoinia on the pipe and not looked for other fungi. She was critical that DNA analysis was not done by Dr Taylor on the pipe but accepted that she had not suggested to the defenders that they conduct such analysis. Placing the pipe in the

garden close to the shed which was known to have Baudoinia was open to criticism as a "strategic placement" and that it would be more likely that the first fungus to find its way onto the pipe was Baudoinia. She observed that no-one had attempted to replicated blackening on surfaces using Baudoinia either in a laboratory or outside. This could have been attempted by inoculating Baudoinia onto a built surface and watching its development over time.

[102] In cross-examination, she accepted that it was relevant to take into account that blackening re-occurs after cleaning. She accepted that the published literature for Baudoinia described it being found close to distilleries or bonded warehouses, but she thought that was simply where people had looked for it. She described the Gomez-Cornelio paper on the Mexican wall which found a single isolate of Baudoinia as a "compelling paper". She agreed that when she visited maturation warehouses there was blackening on the walls of the warehouse with "crazy kinds of communities forming" including lichens which she had not seen elsewhere. She agreed that the literature from Scott and others described a black sooty appearance often with pronounced vertical streaking. She accepted in cross-examination that she could not contradict Dr Taylor's conclusion that Baudoinia was present on a sample taken from a tree in the nature reserve but reiterated the general observation that Baudoinia is morphologically indistinct.

Alastair Wood

[103] Mr Wood is a director and head of planning for Savills. He is a member of the Royal Town Planning Institute and a member of the Royal Institution of Chartered Surveyors. He is also an associate of the Institute of Environmental Management and Assessment.

[104] He produced two reports dated 13 May 2022 and 22 November 2024 which, subject to some minor corrections, he adopted as his evidence. His reports contained numerous photographs demonstrating discolouration on properties of a similar age and style to the pursuers' property. These comparative properties were in Bonnybridge, Denny, Kilsyth, Lennoxtown and Cumbernauld. Housing in Kilsyth was considered as the pursuers' pleadings had acknowledged that Kilsyth did not have elevated ethanol levels. In terms of their distance from the defenders' warehouse in Bonnybridge, Kilsyth is approximately 9km to the west; Denny approximately 2.5km to the north; and Cumbernauld approximately 7km to the south-west.

[105] The conclusion of his reports was that blackening of buildings to varying degrees is common in central Scotland. Some blackening was present on the majority of buildings inspected and reported on. In his opinion, the blackening observed at Woodlea Gardens and the pursuers' property was not notably worse than observed at other locations in Central Scotland.

[106] He confirmed in cross-examination that he was specifically instructed in 2022 not to visit Woodlea Gardens. The supplementary report did contain a photograph of the pursuers' property and other houses on the Woodlea Estate as at November 2024. Mr Wood had simply taken photographs and had no information as to the maintenance regimes adopted by different proprietors.

[107] In cross-examination, he was asked, based on his planning experience, about a decision of Falkirk Council's planning committee dated 15 September 2010 relating to the erection of three warehouse buildings at Bonnybridge. He had not previously seen this decision letter which narrated that the defenders had declined an invitation to carry out a

detailed study into the potential link between the warehouse operation and the development of black mould on nearby structures and vegetation.

John Handley

[108] John Handley spoke to a planning assessment report dated 22 November 2024 which he adopted as his evidence. Mr Handley is a chartered town planner and has been a corporate member of the Royal Town Planning Institute since 1994.

[109] Mr Handley had researched the planning history of the defenders' warehouse site and the pursuers' property. He also looked at the development plans for the Bonnybridge area in general.

[110] Bonnybridge is a traditional manufacturing location which has included coal mining, iron foundries, mills and brickworks. The existence of local resources and good transport links via a canal and railways, contributed to its development as an industrial town with these heavy industries. Currently, Bonnybridge includes industrial estates which have replaced the old foundry sites. The M876 and M80 motorways are close by. The older industrial industries have been replaced with housing led regeneration due to the good motorway connections.

[111] The site of the warehouses had in earlier times included a colliery on part of the site and a sand and gravel quarry. The land on which the Woodlea Estate was developed had historically been part of a farm close to the sand and gravel workings. The defenders' warehouses had been on site since 1981. An application for planning consent for further bonded warehouses was considered by Falkirk Council on 25 March 2009, but this was continued for a site visit in April 2009. Representations had been received about a link between ethanol vapour and the growth of black mould on nearby houses. The planning

committee on 15 September 2010 recommended the grant of planning permission. The planning committee noted that in June 2009, the defenders were asked to undertake a detailed study of the potential link between the warehouse operation and the formation of black mould on structures within the local area. The defenders declined to do so indicating that there was no legitimate basis for such a request since Health Protection Scotland had identified that there was no health impact from any black mould. The defenders had also advised the planning authority that it would not be prepared to consider any payment to clean black mould from nearby houses. A letter from the defenders' then solicitors to the planning authority dated 28 July 2009 indicated that an association between ethanol and the black mould had not been proven and there was no legitimate basis to further defer consideration of the planning application.

[112] Persimmon Homes (East Scotland) Ltd obtained outline planning permission in principle in 1996 and detailed planning permission for land reformation and formation of a wetland pond was approved in June 1999. An application for detailed planning permission for 51 dwellinghouses was submitted in January 2002 and was approved in March 2002. The pursuers' house was likely first occupied in September 2002 as it entered the council tax portal then. The final houses were completed around November 2006 when the completion certificate was issued.

Marcus Collings

[113] Mr Collings is a chartered surveyor who prepared two reports and a corrective report for the litigation. His first report was dated 5 May 2022, and the second report was dated 22 November 2024. Errors in the earlier reports were corrected, and a single corrected report (with corrections highlighted) was lodged for the proof. Mr Collings spoke of his

experience in valuing new build residential properties in the Bonnybridge area. His valuations are for developers rather than individual house purchasers. He had not gone into the pursuers' property.

[114] In his report, he disagreed with Mr Highton's valuation of the pursuers' property at £285,000. His analysis of the sales data relied upon by Mr Highton was that the value of the pursuers' property was £310,000 on 1 October 2024. He could not identify any diminution in value for the property attributable to any propensity to blackening. His assessment of the data found that shorter selling periods existed for Woodlea Gardens properties when compared with comparable areas which indicated that buyers were positively attracted by Woodlea Gardens properties. One of Mr Highton's comparators, 60 Woodlea Gardens was explored in re-examination with him. This property, which was of a very similar size to 42 Woodlea Gardens, and which also overlooked the nature reserve, was sold in July 2023 for £301,000. Mr Collings considered this to be a very good price for 2023. He considered that the pursuer's property had a slightly better amenity than 60 Woodlea Gardens as it had open views to the front and rear, whereas 60 Woodlea Gardens looked onto another house at the front.

[115] Mr Collings confirmed that factors such as noise pollution from a motorway could affect the value of a residential property. He explained that his instructions were narrow. He had been asked to consider the data and determine whether discolouration affects the value of a residential property.

[116] He was asked in cross-examination whether a combination of six factors would, in his professional experience, affect value. Those factors were (i) the presence of fungal black growth on the property, (ii) the fungal growth being a contemporaneous recurring feature, (iii) the fungal growth affecting the patio, garden furniture, fencing, trees, shrubbery and

cars, as well as the exterior walls, (iv) the fungal growth requires regular cleaning with bleach and may require professional cleaning services, (v) the growth is caused by ethanol emissions from an adjacent warehouse, and (vi) the property backs onto a nature reserve which would be generally regarded as beneficial. He agreed that in valuing property, his professional judgment would include looking at the location including nearby factories, roads and amenities. He agreed that he would consider the physical appearance of the property. He observed that a potential purchaser driving around this estate would note that some properties were blackened but many houses were not. He did not consider it unusual for a large estate to see properties in a variety of conditions depending on maintenance.

[117] Mr Collings evidence was that the data which he had considered in relation to this estate did not reveal that the properties suffered any diminution in value on account of the blackening. He did not think that Mr Highton in his first report had properly anchored his opinion on the evidence of comparables. While the comparable evidence for houses close to motorways did illustrate a diminution in value, the comparator evidence for the houses on the Woodlea Estate did not.

Craig Wallace

[118] Craig Wallace adopted his witness statement. Mr Wallace has a BSc degree in Biological Sciences and a diploma in Brewing and Distilling. He has worked for the defenders since 1998. His current role is as whisky platform manager and master blender. He is involved in the blending and innovation of whisky for the defenders in Scotland and around the world.

[119] Scotch whisky must be matured in Scotland. The maturation process involves taking the new spirit from the distillery and placing it in an oak cask for a period. The minimum

period is 3 years. During the maturation process, flavour and colour is extracted from the cask. Most of the defenders' whisky is matured in central Scotland. The location of the maturation process was largely for historical reasons due to the presence of nearby distilleries and the existence of a sufficient workforce. The manufacture of Scotch whisky is dictated by the rules contained in a technical file issued by the Scotch Whisky Association. The technical file notes the effect of climate on the character of Scotch whisky. The prevailing wind from the south west brings warm moist air in from the Atlantic resulting in a cool, mild climate. During the maturation process, the cool moist climate results in a lower overall rate of evaporation (than in warmer drier climates) but proportionality more alcohol evaporates resulting in a reduction in alcoholic strength. The relatively stable temperatures of the Scottish climate enable distillers and blenders to anticipate how a spirit will mature in a certain way and at a certain rate.

[120] Mr Wallace confirmed that the warehouse doors are opened periodically to enable air circulation around the casks. The defenders have several bonded warehouses in the central belt.

[121] He was asked about an email chain from December 2002 involving Mr Law who formerly worked at Diageo. He confirmed that Mr Law, who is now retired, was a master blender who had had a similar role to his own. Mr Law had a role within the technical team at the time of the emails. His position was that he could not comment on Mr Law's discussion as to the potential causes of blackening.

[122] He agreed that he had seen blackening on the exterior walls of distilleries and bonded warehouses. He also thought he had seen blacking on trees adjacent to such buildings. He agreed that blackening could also be seen on some buildings in the immediate vicinity of a bonded warehouse or distillery.

[123] He was not aware that in 2006, the Health Protection Service had commissioned a report relating to the Bonnybridge warehouse. Nor was he aware that in 2009, when the defenders sought permission to extend the bonded warehouses, the planning authorities had expressed an interest in the blackening of adjacent properties. He was not aware that in 2009, the defenders had declined to pay for cleaning of any adjacent properties. He was shown a report by the Air Quality Expert Group on non-methane volatile organic compounds in the UK which referred to increasing emissions from whisky productions over the period from 2000-2017 but could not comment on this. He agreed that the level of ethanol emissions was well monitored for tax reasons. The evaporated loss is about 2% of the liquid's volume per annum.

Graeme Littlejohn

[124] Mr Littlejohn is the director of strategy and communications for the Scotch Whisky Association. He adopted his witness statement. He explained that the strategy and communications team carry out several functions for the association and its member companies.

[125] Scotch whisky is strategically important for the Scottish and UK economies. A 2022 study valued the whisky industry at a gross value added of £7.1 billion to the UK economy. The Scotch Whisky Regulations 2009 set out the legal parameters to produce Scotch whisky and the legal framework for producers to follow relative to the industry's legal protection and status. Those regulations require that a spirit must be matured in a bonded warehouse in Scotland for a period of no less than 3 years. The Scotch Whisky Association works with HMRC to uphold the regulations. The technical file issued by the

Association is the product specification which underpins the productions of Scotch whisky and the geographical nomenclature.

[126] Mr Littlejohn agreed that he had seen blackening at premises associated with the whisky industry but was anxious to emphasise that he had also seen blackening at places with no such whisky maturation or production.

[127] He had no knowledge of contact between someone from the Scotch Whisky Association and Dr Scott regarding possible research into blackening. He had no knowledge of the Scotch Whisky Association carrying out any study into blackening. He was aware that some local planning authorities had taken an interest in blackening as part of the environmental factors under consideration. He was referred to a decision notice of West Lothian Council dated 19 August 2021 refusing full planning permission for the erection of maturation warehouses in Bathgate. One of the stated reasons for refusal was that the proposed development would cause black mould fungus in the surrounding area. Mr Littlejohn was aware of this planning decision. His recollection was that it went to appeal but could not advise the court what the final decision was.

[128] He was asked in cross-examination how the Scotch Whisky Association could hold the view that there was no causal connection between the emission of ethanol from maturation premises and mould growth in the absence of any research carried out at its behest. His response was to refer to the Health Protection Scotland report of 2006 and the Air Quality Expert Group report on non-methane volatile organic compounds in the UK (2020). He confirmed that the whisky industry sought to have close and positive relationships with the communities in which it operates.

Robert Jacques

[129] The parties entered into a joint minute agreeing that his witness statement could be admitted as evidence without being spoken to by him. This simply related to the sampling process at the pursuers' property.

Pursuers' submissions

[130] The pursuers have proved that black sooty deposits are caused by the emission of ethanol, and such deposits are found on the pursuers' house which sits close to a commercial source of ethanol operated by the defenders. The defenders have known since at least 2002 that their bonded warehouse creates the conditions whereby black fungus appears on nearby housing. Regular cleaning is carried out but the blackening swiftly recurs. This amounts to an actionable nuisance for which the defenders are liable in damages.

[131] For damages to be claimed, it is necessary for the pursuers to prove that the nuisance created is "plus quam tolerabile" (*Watt* v *Jamieson* 1954 SC 56 at p 58, *MacBean* v *Scottish Water* 2020 SLT 707; 2021 SCLR 549). It is also necessary for the pursuers to prove "culpa", (*Kennedy* v *Glenbelle* 1996 SC 95 at pp 100-101).

[132] The "plus quam tolerable" test is an objective one but is considered from the standpoint of the victim. The character of the locality is a relevant consideration in determining what is reasonably tolerable, (*Maguire* v *Charles McNeil Ltd* 1922 SC 174 at p 185). There is no defence in nuisance that the pursuer has "come to a nuisance" which had been taking place for some time prior to the pursuers' proprietorship (*Glegg on Reparation* at p 330; *Sturges* v *Bridgman* 1879 11 Ch D 832). The key point is that a party does not have a right to inflict a nuisance on neighbours simply by being first in the neighbourhood. By the

mid-1990s, the character of the area around the bonded warehouse had changed to include residential properties.

[133] An important public interest in the conduct complained of is not relevant to whether there is a nuisance or not, but it might affect the remedy granted by the court. Nuisance is essentially about competing private rights between neighbours. If private rights were to be overridden by a public benefit, there would need to be legislative authority and compensation (*Fearn and others* v *Board of Trustees of the Tate Gallery* [2023] UKSC 4 per Lord Leggatt at para [121-122]). In *Fearn*, the majority confirmed that public interest might be relevant to the remedy but not to the question of liability, (para [114]). In a case of nuisance, the party responsible for the private nuisance has the option of either stopping the activity or paying compensation to the affected neighbour.

[134] "Culpa" can take many forms. It includes negligence but is a wider concept than a failure to take reasonable care. It includes deliberate conduct carried out with the knowledge that harm will result. It is no defence that the pursuer can take remedial steps to avoid the consequences of the defenders' acts, (*Webster* v *Lord Advocate* 1985 SC 173 at p 181).

[135] The pursuers submitted that, evidentially, this was a very simple case which had been overcomplicated by the defenders. The Keith Law email from 2002 demonstrated that the defenders were aware from prior to December 2002 that whisky maturation caused blackening. They knew it was caused by an organism which developed using the ethanol from the "angel's share". The Law email assumed that many fungi species were implicated but Dr Scott has subsequently demonstrated that a rare fungus, Baudoinia, is critically involved. The Law email fixed the defenders' management with knowledge of the problem and the involvement of ethanol vapour as a cause of the problem. Despite that the defenders declined in 2009 to investigate further when requested by the planning authority.

The defenders led no evidence of any steps taken at Bonnybridge to investigate the issues or to reduce ethanol levels. Culpa was proved by the fact that the defenders continued to operate in the knowledge that their operations caused blackening on the nearby houses. It was submitted that culpa could be seen from 2002 onwards. Alternatively, culpa was proved in respect of the period after 2013 when a site visit made it obvious to the defenders that blackening on the pursuers' property had occurred despite the presence of a buffer zone by way of a nature reserve.

[136] The pursuers' evidence should be accepted that the discolouration in and around their property, including on cars and garden furniture, significantly affected their enjoyment of their house. They spent additional time cleaning their property or arranged for professional cleaning. They had to use bleach to remove the staining. They described the ever-present sound of power washers on the estate as neighbours endeavoured to keep their houses clean. They spoke of how depressed they were by the recurring discolouration. It was no answer for the defenders to point to other houses in other towns that suffered a degree of discolouration. The pursuers' evidence, supported by Mrs Michie and Mr Page, demonstrated that the discolouration at the Woodlea Estate was unusual in intensity and speed of occurrence. While the pursuers took regular steps to clean their house, photos of various houses on the estate demonstrated how no. 42 Woodlea Gardens would look if regular cleaning did not take place. Locality is an important aspect of the law of nuisance. Some areas within a community will be more suited for noise and disturbance than others. Locality is a relevant element in the balancing of interests when it comes to an action of nuisance. Although there is a mix of land use within this locality, the pursuers' property is part of a large residential area next to a nature reserve and the pursuers had no reason to anticipate that they would have to put up with a nuisance of this nature. The defenders had

taken no steps, such as seen in *MacBean* v *Scottish Water* and *Jones* v *Ministry of Defence* [2021] EWHC 2276 (QB), to minimise the extent of the nuisance. The importance of the whisky industry to the economy was not a relevant factor in considering the question of nuisance. The nuisance was more than tolerable.

[137] In relation to causation, this was not purely a matter for expert evidence. Inferences could be drawn from other evidence. The evidence from the pursuers indicated that the problem became worse after the further bonded warehouses were added. That supports the inference of the contribution of ethanol to the problem. The scientific evidence confirmed that ethanol promoted the growth of Baudoinia. Baudoinia is a relatively rare fungus, but it has been consistently found in samples taken from the pursuers' home. Their home is downstream of the prevailing wind. Dr Taylor's heat map demonstrated that the highest concentrations of Baudoinia were found to the north-east of the bonded warehouses which is consistent with the prevailing wind coming from the south-west. It is accepted that ethanol evaporates from the casks in the bonded warehouse and the obvious inference is that such ethanol vapour is conveyed downwind. There was no need for ethanol air sampling which Professor Hawksworth had advised would be of limited value.

[138] The pursuers accept that the black staining is not solely comprised of Baudoinia. But the black staining develops through Baudoinia acting as a first coloniser as demonstrated by Dr Taylor's pipework experiment. It is accepted that there is no published literature describing Baudoinia as a first coloniser but the hypothesis is supported by the results of Dr Taylor's experiment. Dr Taylor's work in 2022 in producing the heat map had also shown that Baudoinia developed on a recently cleaned section of lamp post. It was submitted that the defenders continue to operate under a misunderstanding of the relevance of the "first coloniser" theory. It has never been the pursuers' position that Baudoinia is

then succeeded by other fungi and that Baudoinia will disappear from the surface. Senior counsel for the pursuer described the defenders' understanding as being a "succession theory".

[139] The pursuers have led evidence from a number of mycologists who identified the presence of Baudoinia using both DNA analysis (2012 and 2013) and microscopic analysis (2022 and 2024). Although Dr Pringle said there were difficulties with microscopic identification, she also said that this was not a battle between the two techniques. Ultimately, she could not and did not dispute the conclusions of the pursuers' experts that they had identified Baudoinia. Dr Pringle, it had to be remembered, had not carried out any investigations of her own on samples taken from Bonnybridge. Professor Dentinger's DNA analysis had confirmed Baudoinia on the samples taken from the garden gate and the garden shed. His corrected appendix 4 also confirmed that low levels of Baudoinia were found in the samples taken from the house. The court should conclude on the basis of the photographic slides which Dr Scott spoke to in court that the samples from the house did include Baudoinia and that the low-level finding was not a technical artefact.

[140] One of the unsatisfactory features of the defenders' approach to the issues at Bonnybridge, and continuing into the conduct of the litigation, has been their unwillingness to engage in full investigations. When the planning authorities asked for further investigations to be carried out before considering the 2009 planning application, the defenders simply refused to engage and insisted that the application proceed to consideration. In the litigation, the defenders had access to samples taken in 2013 and 2022 but have not disclosed whether they were analysed or the results of any analysis. They had not sought access to the pipe involved in the pipe experiment to analyse what was found on its surface. A common feature of the complaints made by Dr Pringle was that experiments

could have been done to further elucidate a particular issue, such as the effect of ethanol on different species of Baudoinia, but she did not arrange for the defenders to undertake such further work.

[141] In approaching the expert evidence, the court should not be seduced by the defenders' experts' criticisms into applying a higher scientific standard of proof. Proof remained on the balance of probabilities. A fact could be proved in the present case on the basis of experiments which were not peer reviewed if the court was persuaded of the value of the experiment.

[142] The pursuers' written submissions in relation to prescription are not repeated as the defenders did not seek to have either of their two prescription pleas upheld.

[143] On quantum, the pursuers advanced a claim for past losses, including accrued interest of £101,000. This was calculated based on £65,000 for past loss of amenity including interest, and £36,000 for cleaning costs including interest. A sum in respect of future damages was sought in the range of £20,000-30,000.

[144] The loss of amenity claim was advanced under reference to *Hunter* v *Canary Wharf Ltd* [1997] AC 655 at pp 696B-C and 706D-F; *Drennan* v *Walsh* [2023] NICh 6 at paragraph 70; and *Anthony* v *Coal Authority* [2006] Env LR 17 at paragraph 117. The sum claimed was based on approximately £1,500 per annum for 22 years together with accrued interest at 4%. Although it was acknowledged that diminution in value could not be claimed alongside loss of amenity, and that Mr Highton's evidence was problematic, it was suggested that his figure of £25,000 as a diminution in value for the property remained a helpful cross-check against the sum now advanced in respect of loss of amenity. In terms of the costs of cleaning, it was submitted that the evidence of Mrs Michie and Mr Page was a helpful cross-check of Mr Chalmers evidence. The pursuers submitted that annual cleaning costs

of £1,000 had been proved over a period of 20 years which, together with accrued interest, amounted to £36,000. Future losses were claimed although it was acknowledged with reference to dicta of Lord President Inglis in *Stevenson* v *Pontifex & Wood* (1887) 15 R 125 at 129 that a continuing nuisance causing damage was a situation in which further actions of damages could be made if the nuisance was not abated.

[145] The pursuers' motion was to sustain the first and second pleas-in-law for the pursuers; repeal the defenders' first to fifth pleas-in-law; and grant decree in the sum of £100,000 with interest from the date of decree.

Defenders' submissions.

[146] The defenders submitted that the pursuers had failed to discharge the burden of proving that Baudoinia is responsible for discolouration at their property. They had failed to demonstrate that the discolouration was greater than would have been experienced absent any such Baudoinia. Any increase in discolouration which was proved was not more than tolerable and, accordingly, did not amount to a nuisance. The pursuers' causation case was fatally undermined by a number of critical omissions. They led no evidence to show the presence of elevated ethanol in the atmosphere at their property which had emanated from the defenders' warehouse facility. They led no evidence that ethanol was present at particular levels or in a form which stimulated the growth or germination of Baudoinia. There was no evidence on wind direction.

[147] There was an absence of reliable scientific evidence to show that ethanol caused the development of Baudoinia. The evidence from the pursuers' experts was based on a few limited studies carried out by Dr Scott from which the experts sought to hypothesise. Dr Scott found that ethanol vapour stimulated germination and growth of Baudoinia in

relation to three strains of Baudoinia panamericana. This species was not identified at Bonnybridge. This study cannot support the hypothesis that other species of Baudoinia behave in the same way in the presence of ethanol. His study was a laboratory study and it cannot be safely assumed that it reflects how Baudoinia develops in the natural environment. His study has not been replicated by another laboratory. There is no scientific literature to support the assertion that Baudoinia acts as a pioneer organism. This was an untested hypothesis introduced by the pursuers in an effort to make good the evidential gaps in their case on causation. The scientific evidence is unreliable and should be held to be inadmissible or accorded no weight.

[148] The court should conclude that DNA testing is the most reliable method of identifying the composition of the samples taken from the pursuers' property. It is objective - unlike microscopy. It can identify the genus and species of Baudoinia which cannot be done by microscopy. It is the method widely accepted across the mycological community as the most accurate and reliable for identifying fungal species. DNA testing is the most accurate method of identifying the presence of Baudoinia which is morphologically non-descript and cannot be definitively identified by microscopy alone. The DNA testing carried out by Professor Dentinger confirmed the absence of Baudoinia on the external walls of the pursuers' property. Although Professor Dentinger found some Baudoinia on the painted gate and wooden shed, the quantity was small. Even if the court accepts Dr Scott's evidence that some DNA from Baudoinia was present in the samples taken from the house and fence, the percentage is so small that the court cannot be satisfied that it would be a significant contribution to any darkening. There was no evidence that any discolouration on the pursuers' property was caused by any fungus peculiar to this location. The DNA sequencing evidence produced by Professor Dentinger identified the contributions from

various sources to the samples. His conclusion was that no more than 15% of the samples tested was fungi with the most abundant fungi being dematiaceous and meristematic fungi which are also darkly pigmented. Professor Dentinger gave his evidence in an independent manner. He frankly conceded when he had made a coding error and corrected his results. He was realistic in accepting that DNA evidence is not infallible while explaining the value of it in the present circumstances.

[149] Dr Pringle's evidence should also be accepted. She gave uncontradicted evidence that black growths caused by microbes are ubiquitous in nature typically made up of hundreds or thousands of bacteria and other organisms including fungi. Mycologists now use PCR and DNA sequencing techniques to categorically identify organisms.
She confirmed that Professor Dentinger's results accord with the expected biodiversity in a complex microbial community. She explained why the hypothesis of a simple ecological relationship between Baudoinia and ethanol is unreliable scientifically. She also confirmed that there was no proper scientific basis for the proposition that Baudoinia acts as a "first coloniser" or "pioneer organism".

[150] The pursuers need to prove the various steps of causation on the balance of probabilities. If the cause advanced by the pursuers remains in doubt, the pursuers' case fails. It is not enough for the court to accept the more likely of various possible improbable causes (*Rhesa Shipping Co SA* v *Edmunds (the "Popi M")* [1985] 1 WLR 948; *R (on the application of Thomas Maughan)* v *Her Majesty's Senior Coroner for Oxfordshire* [2019] 1 All ER 561 per Legatt LJ at paras [56] and [57]).

[151] The pursuers have failed to prove any form of conduct by the defenders from which culpa can be inferred. The scientific evidence for the causes of the blackening was unreliable and uncertain such that no fault could be attributed to the defenders for failing to draw a

conclusion that their operations were responsible. As discolouration of houses is a common feature in Scotland, the defenders had no reason to believe that their operations caused, or significantly added to, any discolouration at the pursuers' property. Even if causation and culpa are established, the pursuers have failed to prove that the resulting discolouration amounts to a nuisance. The pursuers' complaint does not come close to being plus quam tolerabile. The defenders referred to *Bell's Principles of the Law of Scotland* at s 974; *Watt* v *Jamieson* (supra) at pp 57-58; Stair Memorial Encyclopaedia on Nuisance paragraphs 43 and 67). The complaint is of temporary discolouration of their house. Evidence from Alastair Wood demonstrated that widespread discolouration of housing is commonplace in Central Scotland. This was accepted by the pursuers and other witnesses. It was not possible to distinguish the discolouration seen on the pursuers' property with that on other properties a few miles remote from the defenders' warehouse. Tolerability must be judged by reference to the locality which is a mixed industrial and residential area. The maturation of whisky has been carried out in the vicinity for many years prior to the residential houses being built. There was evidence that for logistical and employment reasons, many maturation warehouses are located in Central Scotland. Any additional discoloration at the pursuers' property is minor. There is no suggestion that the presence of Baudoinia, if it is proved, causes any smell, noise or other disturbance. Any discolouration of the pursuers' property can be removed by cleaning if that is the householder's personal preference. The evidence did not establish a baseline for cleaning the pursuers' property compared to other properties in other areas further from the bonded warehouse. One objective assessment of how any discolouration affects the property is by reference to re-sale values of affected houses, but the evidence established that discolouration had no effect on re-sale values at Woodlea Gardens. It was submitted that in assessing tolerability, account should

be had to the public interest which includes the value of whisky to the UK and Scottish economies. Reference was made to *MacBean* v *Scottish Water* 2020 SLT 707 at para [80]; 2021 CSIH 36 at paras [36] and [55]; *Scott* v *Leith Commissioners of Police* (1830) 8 S 845 at p 846; and the dissenting judgment in *Fearn and others* v *Board of Trustees of the Tate Gallery* (supra).

[152] Any interference must be substantial to amount to a nuisance and tolerability is judged objectively. The pursuers evidence needed to be treated with caution. The pursuers are not truly representative of an ordinary objective person as they have been influenced by campaigning lawyers to view their houses as blighted by discolouration.

[153] The defenders did not address the court in relation to the pleas of prescription (pleas-in-law 4 and 5).

[154] In relation to the claim for damages, there was no evidence that the pursuers' house suffered any diminution in value. Mr Highton's evidence was inadmissible as he had failed in his duties to the court and had ultimately withdrawn his conclusions. Alternatively, it should be accorded no weight. Mr Collings' evidence that there was no diminution in value should be accepted. The valuation evidence also established that properties in Woodlea Gardens sold more quickly than in other surrounding areas. The objective evidence of sale timings and sale values discloses that any discolouration does not affect the desirability of living in Woodlea Gardens. Having concluded that there was no diminution in value, that also was relevant to the pursuers' alternative formulation of damages seeking loss of amenity. It would be expected that any loss of amenity would be reflected in the value that purchasers would be willing to pay for a house. Damages for loss of amenity for the use of a property due to nuisance do not include damages for personal distress or inconvenience, (*Raymond* v *Young* [2015] HLR 41 at paragraph 27; *Fearn & Others* v *Board of Trustees of the*

Tate Gallery (supra at para [11]). The claim for costs of cleaning failed as the pursuers had not proved any excessive costs of cleaning over and above the routine costs which would be expected in the absence of any alleged nuisance. In any event, there was no vouching for the costs allegedly incurred by the pursuers. The claim for cleaning costs is unvouched. Nor have the pursuers led evidence for a baseline of cleaning to enable the court to assess any additional costs of cleaning required at this locus. The pursuers accepted that they cleaned their house more often than others. The court has no basis on which to assess the extent of any additional cleaning reasonably required.

[155] The defenders' motion was that the court should uphold the second and/or third pleas-in-law for the defenders; repel the pursuers' pleas-in-law; and grant decree of absolvitor. The defenders made no submission in relation to their pleas of prescription.

Decision

Objections to experts and other evidence

[156] The court listened to many days of detailed evidence from distinguished mycologists in relation to a fungus which, it was broadly accepted, had been the subject of relatively limited published research. These experts disagreed on the conclusions which could be drawn from the limited research, and the best methods for investigating the allegations in this case. Before embarking on consideration of the scientific evidence, it is helpful for the court to remind itself that it does not, and cannot, set out to be the final arbiter of the scientific issues. Further scientific research in future years may reveal scientific truths which elude this court. In *Shotts Iron Co* v *Inglis* (1882) 7 App Cas 518, the Right Honourable John Inglis of Glencorse sought declarator and interdict in relation to the calcining of ironstone (burning off impurities from ironstone in bings) on land adjacent to his estate. On

his behalf, it was contended that trees on his Glencorse estate were damaged by sulphuric acid fumes. As in the present case, the parties *in Shotts Iron Co* v *Inglis* led experts who had carried out very different scientific tests. One set of experts analysed the content of rainfall collected when bings were being burnt compared to rainfall collected at other times. The other set of experts analysed samples of healthy, diseased and dead leaves and twigs for sulphur. In refusing the appeal, Lord Selbourne, LC observed that where eminent scientists disagree, the judge or jury must decide as well as they can between the competing theories, (p 528). It will be well understood that whatever the standard of the scientific research brought before this court, it is not the role of the court to stamp any factual conclusion as having been proved to a scientific standard, (*Dingley* v *The Chief Constable, Strathclyde Police* 1998 SC 548 per Lord Prosser at p 603). Scientific proof differs from the legal standard of proof. This court simply determines on the balance of probabilities which competing contention is proved, (*Dingley* (supra) per Lord President Rodger at p 600). The court must apply logic and common sense to the conflicting scientific views in determining what has been proved and what is not proved, (*Best* v *The Wellcome Foundation Ltd* [1993] ECC 342 per Finlay CJ at para [67]). And just as it is not for this court to declare that a particular matter has been scientifically proved, it is not for this court to make a finding that a particular scientific opinion has "no basis is science" (defenders' written submission at paragraph 3.50).

[157] With that general observation, I turn to deal with a number of objections made to the expert evidence led in this case. These preliminary objections were made by the defenders challenging the admissibility of the expert evidence led by the pursuers. However, the pursuers also challenged the objectivity of the defenders' experts in closing submissions. The defenders challenged the admissibility of the pursuers' experts by reference to a line of authority including *Kennedy* v *Cordia (Services) LLP* [2016] UKSC 6; *Dingley* v *The Chief*

Constable, Strathclyde Police 1998 SC 548; *National Justice Compania Naviera SA* v *Prudential Assurance Co Ltd (The Ikarian Reefer) (No 1)* [1993] 2 Lloyds Rep 68; *Daubert* v *Merrell Dow Pharmaceuticals Inc* (1993) 509 US 579; *Amorgianos* v *National R R Passenger Corp* (2002) 303 F 3d 256; and *General Elec Co* v *Joiner* (1997) 522 US 136. In short, it was submitted that the expert evidence (a) comprising unreasoned assertion, (b) was presented by experts without the requisite knowledge and experience, (c) was presented by experts lacking independence, and (d) was based on methodologies not considered reliable by reference to a relevant body of scientific knowledge. In the present case, the attacks on the independence of the pursuers' experts had a pro forma feel about them. It is important that expert witnesses are not discouraged from becoming involved in litigation by any perception that attacks on their professionalism and independence are common place.

[158] I repel the defenders' objections directed at the qualifications of the pursuers' experts to give evidence and to suggestions that they were not independent. I do not accept the defenders' suggestion that Dr Scott's evidence was influenced by a financial interest in the litigation. Dr Scott confirmed in evidence that his evidence was not given under a contingency fee arrangement. He has a commercial company, Sporometrics which undertook some of the analysis in this case for which payment was made in the usual way. Sporometrics advertises a testing service to identify the presence of Baudoinia. However, the defenders' submission that he has a direct financial interest in this litigation goes too far. It may be correct, as the defenders suggested, that Dr Scott's scientific reputation rests to a significant extent on his research in this field, but that does not make him a partial witness or an advocate for a cause. If experts were disqualified from acting as expert witnesses because they have developed a particular expertise and reputation in relation to a specialist area, the courts would rapidly see a diminishing supply of suitably qualified experts. Generalists

would be favoured at the expense of the uniquely qualified. The defenders submitted that for Dr Scott "all roads lead to Baudoinia". It was submitted that he was evasive, argumentative and avoided questions which he was uncomfortable with. I do not agree with those criticisms. I considered that he gave his evidence in a measured manner and that he was candid about the gaps in the scientific understanding of Baudoinia.

[159] I do not accept that Dr Scott's impartiality is called into question on account of the defenders' suggestion that he and Dr Summerbell suppressed the Jonah Ventures DNA results on the 2021 samples. Although the Jonah Ventures results were not before the court, and I shall comment on that further below, the evidence was that they were disclosed to the defenders as opposed to being suppressed.

[160] The only issue which arose during the proof which could potentially have called into question Dr Scott's suitability as an expert witness was during cross-examination on day 8 of the proof. On two occasions – when he was being asked about the lack of time course studies to study Baudoinia near warehouses and when he was being asked about the uncertainty as to whether restricting the level of ethanol emissions could reduce Baudoinia growth – he expressed concern that he was being taken into areas covered by a non-disclosure agreement which he had with Pernod Ricard. Senior counsel for the defenders, no doubt wisely, did not pursue these issues any further. The court does not know any more about this non-disclosure agreement, but it can be readily understood that an expert who is so constrained places himself at a risk of being unable to fulfil his obligations to the court. I do not say that that has occurred in this case, but the risk should have been obvious to Dr Scott.

[161] Dr Scott and Dr Summerbell's independence was also challenged by the defenders on the basis that they had produced joint reports. The defenders complained that this

amounted to "witness stacking". It was said that this was duplication of expert evidence which obscured whether each witness had the necessary expertise to assist the court while also leaving uncertain the source for the final opinion expressed in the report. The suggestion appeared to be that they could not truly have fulfilled their expert duties if the reports were a compromise between their professional opinions. Dr Summerbell met that attack by describing it as "philosophical nihilism". I was not persuaded that there was any merit in the defenders' argument. Both experts were able to explain that their reports fully reflected their own independent views. They explained how their reports were co-authored and their respective roles. The defenders' final written submission observed that Dr Summerbell contradicted the evidence of Dr Scott and Dr Taylor on certain matters. That simply confirms that the pursuers' experts were independent of each other, were able to disagree on some points, and the defenders were able to identify where such disagreements existed.

[162] The defenders challenged Professor Hawksworth's impartiality on the basis that he provided "tactical advice" to the pursuers' legal team when advising that air sampling work should not be done. I agree with the pursuers that this was not "tactical advice". It was his professional opinion that air sampling would not advance matters. He considered that there were technological limits to such studies. His advice was built on his own experience of air pollution studies. He recommended experiments from which a heat map could be prepared. Professor Hawkworth's advice in relation to the pros and cons of further scientific investigations is fully in accordance with the type of advice commonly given by experts to legal teams. It was also submitted that he was exposed as a partial witness when defending the manner in which Dr Taylor carried out the pipe experiment. It was said by the defenders that Professor Hawksworth was used as "an advocacy device" such that I should exclude his

evidence from consideration, failing which, give it no weight. The defenders' submission seeks to elevate criticisms of parts of his evidence into a broader attack on his professional standing. I completely reject that approach. Professor Hawksworth gave his evidence as a highly experienced and independent expert witness. I hold his evidence to be admissible.

[163] Senior counsel for the defenders made a motion before Dr Taylor's evidence commenced to exclude her evidence in its entirety, which failing to exclude her report dated 4 October 2024. Exclusion was sought on the basis that Dr Taylor had produced an expert report which was misleading by omission and which failed to make the disclosures expected of an independent expert. The alternative submission was based on the disclosure during Mr Chalmers' evidence that he had been involved in sampling the pipe located in his garden. I was asked to find that Dr Taylor had sought to mislead the court in her October 2024 report by failing to fully disclose how her experiment was to be carried out including the involvement of the first pursuer in the collecting of samples. That, it was submitted, went to the heart of her role as an expert witness with duties to the court. I was also asked to find that the first pursuer's involvement in the collection of samples for further examination calls into question the independent and skilled nature of Dr Taylor's evidence, and that I should conclude that the evidence from the October 2024 report is inadmissible. I refused the defenders' motion and decided that I should hear the evidence under reservation. These criticisms of Dr Taylor were ones which I considered should be put to her for her response. The significance of an untrained person such as the first pursuer collecting samples might or might not be relevant to the weight which can be placed on the ultimate findings from that experiment, but I could not form a view on that without hearing further evidence. The defenders have renewed their motion in respect of Dr Taylor with the additional criticism that she failed to disclose in her reports that she had visited a site in

Leven to educate herself on the fungus apparently implicated in this case. Having heard the evidence, I repel the objections. I am satisfied that Dr Taylor fulfilled her duties as an expert witness in relation to the 2024 experiment. She candidly explained why the pipe experiment took the form it did in terms of its ultimate design and the process whereby the sampling took place. Ultimately, I have formed a view on the weight to be given to that evidence which is, in part, influenced by the manner in which it was carried out but the evidence was admissible and relevant. Her failure to mention in her reports that she had made a visit to Leven as part of her preparatory work does not call into question her role as an expert witness. This was, in my view, an innocent omission on a relatively minor matter. The detail of her expert evidence did not seek to draw on any findings from such a preparatory visit.

[164] In their final submissions, the defenders submitted that Mr Highton failed in his duties as an expert and his evidence should be held as inadmissible, which failing should be accorded no weight. The problems with his evidence have been alluded to. While Mr Highton had failed to obtain and respond to a critique of his first report, I am unwilling to conclude that that alone is such an egregious breach of his duty to the court that his evidence should be inadmissible. Rather, I find his evidence admissible but accord it very little weight.

[165] The pursuers' final submission included an accusation that Professor Dentinger demonstrated bias in the manner of his reporting on some of the Baudoinia species falling into the "other fungi" discussion in his first report. The pursuers' criticism was that Professor Dentinger decided not to list other Baudoinia species as being present in the sample which would have left the reader with the impression that the "other fungi" comprised only non-Baudoinia fungi. I do not accept that Professor Dentinger's decision

amounts to clear bias. Equally, it cannot be said that the relevant paragraph demonstrates the "openness and transparency" which Professor Dentinger professed to be achieving. Importantly, there was a later reference at paragraph 8.7 of the same report which would have alerted the reader to the fact that other species of Baudoinia were part of the other fungi found in the sample. Reading the report as a whole, I reject the proposition that Professor Dentinger was biased.

[166] The defenders objected to the evidence of Mrs Michie and Mr Page on the basis that it was collateral evidence. The pursuers submitted, with reference to the evidence before the court in *Maguire* v *Charles McNeill Ltd*, that evidence of the views of other people operating within the locality was relevant to the issue of tolerability. In *Maguire*, Lord President Clyde (at p 187) supported the Lord Ordinary's decision that there had been no nuisance and observed that no evidence had been led from various classes of people to demonstrate that they had been affected by noise. Tolerability is judged objectively and the evidence of Mrs Michie and Mr Page was relevant to that part of the case. I agree with the pursuers' response, and I repel the defenders' objection to this evidence

[167] The defenders submitted that the scientific papers produced by Dr Scott's group were inadmissible as not meeting the standard of admissibility for skilled evidence. In short, it was submitted that there was no reliable body of scientific knowledge of the relationship between ethanol and the stimulation of germination and/or growth of Baudoinia. I reject that submission. Several research projects have been undertaken and reported on in scientific journals by Dr Scott's team. Those studies provide a basis for some of the propositions advanced on behalf of the pursuers in this case. The studies undoubtedly have their limitations, as Dr Scott accepted, but they have not been contradicted by other scientific researchers. The defenders' experts have made criticisms of

Dr Scott's research within their reports prepared for this litigation, but have not carried out their own independent research into the role of ethanol as a factor in Baudoinia proliferation.

[168] Senior counsel for the pursuers observed in final submissions that the defenders written submission contained about 50 pages devoted to objections to the evidence. During the proof, it was a regular feature that objection was taken, and reserved, in relation to matters which were said to go beyond the record or extended into a technical area which had not been the subject of discussion in the expert reports. Having dealt with the challenges to the admissibility of witness evidence, I propose to deal with the remaining objections as a broad group rather than individually. With the exception of two objections made during the course of the proof, I repel the defenders' objections advanced on these lines. Subject to those two matters, I have not formed the impression that any of the evidence led by the pursuers went beyond the permissible bounds of the pleadings or the expert reports as disclosed. The defenders appeared to have a very well-resourced legal team and were able to cope admirably with all the evidence which emerged. I shall uphold an objection taken (day 5 pp 74-75) to evidence adduced from Dr Scott regarding unpublished results from research on Baudoinia orientalis and Baudoinia caledoniensis when exposed to ethanol. I also uphold an objection taken to a passage in Dr Scott's evidence-in-chief (day 5, p 77) where he started to give evidence about unpublished panel studies on the development of Baudoinia. Neither of these matters could have been anticipated by the defenders from the reports lodged in process. But, in any event, the evidence from Dr Scott on these issues was undocumented and of no evidential weight since the court could not properly evaluate it.

Whether a nuisance has been proved

[169] A necessary starting point is to determine whether the pursuers have proved that Baudoinia is present, to any extent, at 42 Woodlea Gardens. The first samples taken and analysed by Sporometrics in 2012 did find Baudoinia on the outdoor playhouse at the pursuers' property, but two other samples taken at the house did not test positive for Baudoinia. That sampling exercise did identify Baudoinia on a nearby lamppost and at the communal playground in front of the house. The next sampling and testing in 2013 by Sporometrics resulted in positive tests for Baudoinia on all five samples taken at the pursuers' house. Sporometrics used DNA analysis for the 2012 and 2013 samples. There was no challenge at the proof by the defenders as to these findings. The defenders had been provided with their own copy of the 2013 samples, but no evidence was led as to whether the defenders carried out analysis of those samples. Professor Dentinger was unaware that the defenders had been provided with their own copy of the 2013 samples.

[170] In terms of the chronology of sampling, the next samples were taken in July 2021 by Dr Taylor and Mr Jacques. These samples were subsequently analysed by Dr Scott using microscopy and by Professor Dentinger using DNA analysis. Their conclusions will be considered after noting some other sampling around that time.

[171] Dr Taylor took a sample from a tree in the nature reserve in March 2022. She identified Baudoinia from the tree sample using microscopic analysis. In November 2022 she took several samples from various substrates on eight transects emanating from the bonded warehouse. Her sampling did not include samples taken from the pursuers' property itself. She identified Baudoinia on many of the slides produced from that sampling exercise and constructed a heat map showing the levels of Baudoinia found in different directions from the warehouse. Her identification of Baudoinia on these slides was

confirmed by Professor Hawksworth. Professor Dentinger and Dr Pringle queried the accuracy of a positive identification of Baudoinia using microscopy alone citing the phrase that Baudoinia was "morphologically indistinct". However, neither expert went so far to claim that Dr Tayor and Professor Hawksworth had misidentified the fungus on any of the slides. They did not positively identify a different fungus on these slides using their own microscopic analysis or DNA testing. I am satisfied that Dr Taylor did correctly identify Baudoinia on the slides produced from these two sampling exercises in 2022. Of course, this only relates to samples from the area surrounding the pursuers' property.

[172] A large part of the proof was taken up with the analysis of the samples taken in July 2021 by Dr Taylor and Mr Jacques. The evidence before the court was that the pursuers initially instructed and obtained a report on those samples from Jonah Ventures. This was DNA analysis of the samples. The results from Jonah Ventures were not produced to the court and were not discussed within the reports of Dr Scott or Dr Summerbell. I did not find either Dr Scott's or Dr Summerbell's explanations for their exclusion to be helpful in understanding why the results were not before the court. Dr Scott suggested that the DNA analysis was immaterial. The DNA analysis did not distinguish between living and dead material. He said that the DNA analysis supported his microscopic analysis "to some extent" without expanding on that. It is difficult to understand why DNA analysis was arranged by the pursuers on the 2021 samples if a view had been taken that the results could be of no material value. Such a view would call into question the value of the 2012 and 2013 analysis which was relied upon. Dr Summerbell initially appeared to be under the impression that a full explanation of their view on the Jonah Ventures 2021 results had been disclosed in their 2025 report. Once it was pointed out that their 2025 report did not discuss the Jonah Ventures results, nor include the Jonah Ventures spreadsheet in the list of

documents considered, he simply ascribed the same criticisms which he made of Professor Dentinger's approach to that of Jonah Ventures. Ultimately, this was unhelpful for the court. The court should not speculate on what the Jonah Ventures results were but it is able to take into account, when considering criticisms of Professor Dentinger's approach, that the pursuers have access to their own DNA results on samples taken on the same day. It might be thought that if Jonah Ventures conclusions differed markedly from Professor Dentinger's, the pursuers would have brought that to the court's attention as part of an attack on Professor Dentinger's report.

[173] Dr Scott did carry out microscopic analysis of the samples taken in July 2021 from five locations on the pursuers' property. His evidence was that Baudoinia was found on slides produced from samples taken at all five locations. His identification of Baudoinia was supported by Dr Summerbell. The court was taken through some of those slides and Dr Scott was able to explain the basis for his identification of Baudoinia against textbook references. As with their criticism of Dr Taylor's microscopic identification, Professor Dentinger and Dr Pringle queried Dr Scott's ability to correctly identify Baudoinia from these slides but ultimately shied away from expressing an opinion that he was wrong. I accept the evidence of Dr Scott, Dr Summerbell and Professor Hawksworth that Baudoinia can be identified using microscopic analysis alone provided that the mycologist is sufficiently skilled and informed. Professor Dentinger accepted that his DNA analysis of the samples from the wooden shed and painted iron gate at the pursuers' premises contained Baudoinia and so Dr Scott's identification of "abundant filaments and conidia of Baudoinia" at those locations is not controversial.

[174] The main area where there was disagreement related to the analysis of the samples taken from the side of the house. Dr Scott found one sample to contain "occasional"

fragments and the other to contain "abundant" fragments of Baudoinia.

Professor Dentinger's revised analysis found 0.02% and 0.03% of the two samples to test positive for Baudoinia but he considered this to be a technical artefact – in other words a byproduct of the technology rather than a true finding. Professor Dentinger accepted the possibility that these low level findings could be valid findings of some Baudoinia in those samples. He did not carry out any further analysis to resolve this question. Dr Scott was also able to identify a fragment of Baudoinia on a taped sample (S1-T) despite the DNA analysis for that sample failing to identify any Baudoinia sequences. On this matter, I find Dr Scott's position to be more persuasive. He was able to take the court through a series of slides and explain why he identified Baudoinia on each slide. This included the slides for the side of the house. The basis for Dr Scott's microscopic identification is one which the court can readily follow from his demonstration. The court could see the organisms identified by Dr Scott as Baudoinia. By way of contrast, Professor Dentinger's opinion is based on a professional assumption that results below a certain level should be disregarded as technical artefacts. He did not take any further steps to test that assumption in relation to these DNA sequences which were identified as Baudoinia by his analysis. Although Professor Dentinger's DNA analysis found no Baudoinia on the samples taken from the wooden fence, I also accept the evidence of Dr Scott that Baudoinia could be identified from the slides which were placed before the court.

[175] The pursuers have proved that Baudoinia fungus has been identified at 42 Woodlea Gardens. It has been found on the side of the house, garden shed, garden fence and garden gate. I make no finding in relation to its presence or absence on the pursuers' cars which were not analysed. For the obvious reason that cars will be exposed to different environments depending on where they are driven to and parked, I am not willing to simply

assume that any unusual staining seen on the surface of a car must involve the same fungi identified at 42 Woodlea Gardens. I also observe that in relation to the house, the samples from 2012, 2013 and 2021 did not include samples taken from plastic pipework, window frames, glass or soffits at the house.

[176] The defenders submitted that the pursuers had not proved that the presence of any Baudoinia on the house was linked to their operations at the bonded warehouse. In the first place, largely based on Dr Pringle's evidence, it was submitted that the scientific link between the presence of ethanol and the proliferation of Baudoinia was not established. Secondly, it was submitted that there was no evidence led by way of air sampling to demonstrate that ethanol from the bonded warehouse was present in the atmosphere at the pursuers' house.

[177] Professor Hawksworth noted that all of the Baudoinia isolates which mycologists have worked with in recent years have come from environments where ethanol was present. As he put it, Baudoinia "just doesn't turn up elsewhere. That's the reality." Dr Scott gave similar evidence noting that in analysing over 25,000 samples from the built environment, Sporometrics had only ever identified Baudoinia where there was a source of ethanol. The evidence was that Baudoinia is a conspicuous mould which would not be overlooked if it appeared elsewhere. Indeed, Professor Hawksworth considered that observing Baudoinia away from a known source of ethanol would likely be the subject of a published study as it would cut across current scientific understanding. Dr Taylor gave similar evidence. The earliest recognition of the fungus was in France and was associated with the distillation of cognac in the 1870's. In more recent times, the defenders created their own internal paper sometime prior to December 2002 recognising that a harmless black fungus exploited the "angel's share" as a carbon source and proliferated on bonded warehouses and nearby

housing. A report from Health Protection Scotland (2006) investigating black mould on properties in Bonnybridge referred to a 1988 survey in which 47 out of 54 District Councils reported the phenomenon of black mould at maturation warehouses. Thus, there is strong anecdotal evidence for more than a century associating blackening of distilleries and bonded warehouses with an unusual type of sooty fungus. The further research carried out by Dr Scott and others and published in 2007 demonstrated a link between improved germination and exposure to certain levels of ethanol. While that research left many questions unanswered, it did identify that ethanol could stimulate the proliferation of Baudoinia.

[178] Dr Pringle's evidence was that it was unsafe to draw conclusions from the 2007/08 research. She pointed out that the mechanism whereby ethanol is said to assist germination and growth remains unknown. At higher concentrations it appears to inhibit germination and growth. The laboratory research also showed that Baudoinia could grow in the presence of glucose. The 2007/08 research has not been replicated by other scientists in different laboratories which would increase confidence in that research. The research was carried out on a single species of Baudoinia, and she argued that it cannot be assumed that all species would react to ethanol in the same way. Dr Pringle described the Gomez-Cornelio 2016 study of fungi found in a Mexican wall as "one of the most compelling papers" in this case. She sought to draw support from that paper for her proposition that Baudoinia is not always found close to ethanol sources. Dr Pringle's description of this report is overblown. That paper reported a single isolate of Baudoinia from 268 isolates found on an old biofilm. There was no discussion within the paper of that result. As Dr Scott observed, there could well have been sources of ethanol present, such as through

fuel additives. The Gomez-Cornelio paper does not provide a persuasive case that colonies of Baudoinia are found where there is no local ethanol source.

[179] I did not understand Dr Scott to dispute that much remains unknown about this fungus and its interaction with ethanol. He expressed frustration that other researchers, and funders of research, had not taken up the mantle from him. He also accepted that ethanol was not critical for the development of Baudoinia and that it could grow in the presence of glucose. But on the basis of the observations of such blackening being almost exclusively found close to distilleries and bonded warehouses, and the 2007/08 research which found that low levels of ethanol spurred growth of Baudoinia, I find it proved that this fungus does proliferate due to the presence of ethanol vapour being released into the atmosphere.

[180] The 2007/08 research may have limitations, but it has not been contradicted by later research. It is correct that this research was carried out before the identification of different species of Baudoinia. It was carried out on a single species (now referred to as Baudoinia panamericana). However, Dr Scott observed that all five species are phylogenetically closely related with small variables in the DNA. They share a common habitat in that each species has been found close to alcohol production facilities. I see no reason to doubt that all five species show improved germination and growth in the presence of ethanol vapour.

The defenders had access to all of the five species and could have carried out experimentation on the growth of any of the species in the presence of ethanol if they had wished. It is a reasonable inference that all species react in a broadly similar way when exposed to ethanol.

[181] I do not consider that an absence of evidence of airborne ethanol levels is critical for the pursuers' case. Professor Hawksworth advised that such testing would be of limited value. Dr Pringle was critical of the absence of such testing, but I understood her to

subsequently accept that she was unsure whether such testing could be adequately carried out. I acknowledge that air sampling for ethanol had been carried out by Health Protection Scotland (report by McRae and another issued March 2006) so some form of ethanol testing in the atmosphere was possible. The court must proceed in the absence of any evidence of ethanol levels in the atmosphere. What was before the court was general evidence relating to the evaporation of ethanol during the maturation process. The "angel's share" is part of the lyricism of Scotch whisky. Craig Wallace from the defenders explained how approximately 2% of liquid by volume evaporated each year during maturation and that the Scottish climate resulted in a proportionately higher level of ethanol evaporation compared with warmer, drier climes. The evidence from the Air Quality Expert Group on non-methane volatile organic compound emissions in 2020 observed the increasing volumes of ethanol released into the atmosphere from the whisky industry. The ethanol which evaporates from the defenders' bonded warehouse enters the atmosphere and will be dispersed depending on weather conditions. The technical file maintained by the Scotch Whisky Association observes that the prevailing wind in Scotland is from the south-west. There was evidence from Dr Taylor's 2022 heat-map that higher levels of Baudoinia fungi were found within the community to the north-east of the bonded warehouse. It is a reasonable inference that ethanol released during maturation is dispersed depending on the wind direction. The pursuers' house, which sits to the north-east of the warehouse, is directly downwind and has been exposed to a significantly greater level of ethanol than the average Scottish home.

[182] I have found that Baudoinia fungus has grown on the pursuers' property because of ethanol vapour released from the defenders' bonded warehouse. However, that factual finding is not sufficient for the remedy sought by the pursuers. The pursuers' complaint is

that the blackening of their property amounts to a nuisance. The pursuers' experts accepted that any blackening is not composed solely of Baudoinia. It likely includes a wide range of organisms including other types of fungi, algae and insect material. Some, not all, of these other organisms are darkly pigmented and will contribute to the aesthetic effect.

The pursuers pleadings at Article 4 of condescendence offer to prove that the degree of discoloration at the pursuers' property is "more substantial" that that commonly encountered on damp surfaces where Baudoinia mould is absent. The pursuers need to establish that the additional presence of Baudoinia within any blackening on their property is material to the aesthetic nuisance which they complain of, (see *Maguire* v *Charles McNeill Ltd* 1922 SC 174 per Lord President Clyde at p 185).

[183] The pursuers' analysis of samples only identifies the presence or absence of Baudoinia in that sample. None of the pursuers' testing sought to calculate the percentage of Baudoinia in the sample, or indeed, to identify the other organisms within the samples potentially contributing to the discolouration. For example, Dr Scott's description of an "abundance" in relation to fungi on samples taken in 2021 simply means a large number of Baudoinia cells were seen on the slide. It is not a quantitative comparison with other material within the same sample. The only attempt to assess the percentage of Baudoinia compared with other organisms within a sample was by Professor Dentinger's DNA analysis. His analysis indicated that a large variety of different organisms were present within all the samples. This analysis identified a minimum of 53 and 61 species on two of the samples taken from the side of the house, and a minimum of 50, 109 or 201 species on the painted iron gate. In terms of the percentage of Baudoinia within a sample, his analysis identified a range of 41-49% for the wooden shed and 16-80% for the painted

iron gate. Dr Scott agreed in cross-examination that Professor Dentinger's DNA analysis had identified several other darkly pigmented fungi within the samples tested.

[184] The pursuers' submission was that the defenders are responsible for the blackening, regardless of the precise mix of organisms, since Baudoinia is the critical "first coloniser". Absent Baudoinia forming on the pursuers' property, their property would remain free of discolouration or, at the very least, any discolouration would be much reduced. Thus, the pursuers say that Baudoinia first colonises the pursuers' property and creates an environment for other organisms to flourish in an otherwise hostile environment. Senior counsel for the pursuers was careful to say that the pursuers did not seek to prove more than that. In particular, the pursuers did not offer to prove that Baudoinia would, in time, be wholly superseded by other fungi.

[185] I did not understand the experts on both sides to disagree with the basic concept of a fungus acting as a "first coloniser". Different fungi will develop in different environments and on different substrates within an environment. The first colonising fungus for a particular environment will exploit an evolutionary advantage over other organisms to colonise the substrate. Once initial colonisation has occurred, that may change the surface of the substrate enabling other organisms to join and thrive on the colony creating a complex mix. None of this appeared to be controversial. Where the experts disagree was in relation to whether there was evidence that Baudoinia acted in this manner at the pursuers' property.

[186] Dr Scott said that his "sense" was that without this first colonisation by Baudoinia at the pursuers' property, there would be no blackening event. He acknowledged that there were no published papers on Baudoinia acting as a first coloniser. He did refer to some panel studies which looked at the colonisation of those panels over a period, but these

studies had not been produced or discussed in his report, and I have upheld the defenders' objection to that evidence. Although he expressed the opinion that there was enough evidence to support the "first coloniser" theory applying to Baudoinia, he accepted that no papers had been drafted setting out the nature of the evidence. I did not find Dr Scott's evidence on this issue to be persuasive. It was little more than "*ipsa dixit*" based on undisclosed and unknown research.

[187] The pursuers sought to rely upon Dr Taylor's pipe experiment as supporting the "first coloniser" theory. It is important to recognise that Dr Taylor was very careful to acknowledge the limitations of this experiment. She described it as a "proof of concept". She said it was a "starting point" for further testing. For such an important part of a bitterly contested case which has been going through the court process for over a decade, it is surprising that the pursuers had not moved beyond such a preliminary experiment.

[188] There was a superficial attraction to the conclusions which Dr Taylor and others sought to draw from the pipe experiment but, ultimately, I have concluded that it is insufficient to support the pursuers' position.

[189] The choice of a PVC pipe for this experiment seems to be an odd one. It will be recalled that none of the previous sampling at the pursuers' property had taken place on PVC pipework. Dr Taylor's work in 2022 which resulted in the generation of the heat-map had identified that the levels of Baudoinia appeared to be influenced by the substrate tested. Plastic items were identified in that piece of work as being more heavily contaminated with Baudoinia than, for example, stone and cement. Dr Taylor's conclusions from her work in 2022 fit with the evidence of Dr Summerbell and Dr Pringle that the substrate is an important factor on whether a particular fungus will be able to flourish. Whatever inference might be drawn from the pipe experiment in relation to first colonisation of PVC, it does not

follow that Baudoinia will be a first coloniser for other substrates. In the present case, the discolouration on the external walls of the pursuers' house is such an important part of their complaint, it would have been helpful if a surface comprising harling and/or stonework had been used.

[190] The original plan outlined by Dr Taylor was to use two substrates namely a fascia board and a pipe, but she could only purchase a section of pipe when she went to acquire the equipment. She had also intended to use a control in the vicinity of the bonded warehouse but in a position where no Baudoinia had been found on previous sampling. Ultimately, she decided to place the control pipe in her own garden for security and ease of testing. For such a potentially significant experiment, reducing the number of substrates and selecting a control site largely for convenience detracted from the value of the experiment.

[191] This experiment did not operate over a sufficient period to give the court confidence that it demonstrates how a complex colony is instigated with Baudoinia acting as a first coloniser. Nor did the experiment have sufficient controls to demonstrate how the absence of ethanol vapour at this location would avoid blackening, or at least, would significantly reduce the growth of the blackening. It would have been more relevant if a series of controls had been placed close to the pursuers' property but in a location which was not exposed to the risk of ethanol vapour from the bonded warehouse. In that way, the controls would have been exposed to similar environmental conditions as the pipe at the pursuers' property with the main variable being the absence of ethanol. That might enable a view to be formed as to whether, as Dr Scott surmised, Baudoinia is the critical factor for the onset of discolouration. It might have enabled the court to assess whether the degree of

discolouration was substantially more in the blackening which contained Baudoinia when compared to any blackening on the controls.

[192] The section of pipe placed in the pursuers' garden was positioned very close to the garden shed. The Dentinger analysis found a significant volume of Baudoinia in the samples taken from the shed in 2021. Dr Taylor's finding that Baudoinia was detected on that pipe within a short period of time after the experiment started, may have been affected by the very short distance between a known source of the fungus and the test pipe. This is an example where replication of the experiment using pipes in different positions on the pursuers' property might have indicated whether the experiment results have been influenced by the position so close to a known source of the fungus.

[193] There were several more minor criticisms of the pipe experiment which add to the impression that this experiment was casually progressed. Although I have no reason to doubt that Mr Chalmers sought to follow his instructions in taking and storing the tapings, it is not satisfactory that a litigant with a financial interest in the outcome of the litigation should be tasked with this. The experiment has not been replicated by others. That affects the weight to be given to any purported findings. I do not agree with Professor Hawksworth that there was a degree of replication since there were sequential samples taken each month. This is not replication in the established sense of others carrying out the same experiment. During his evidence, Professor Hawksworth dismissed Dr Pringle's opinion on one aspect of Baudoinia as being based on a single unreplicated experiment so, he concluded, one could not have a lot of confidence in it. Such an observation applies equally to the pipe experiment.

[194] A final difficulty which I have with the pursuers' first coloniser approach is how it fits with the Dentinger analysis of the samples taken from the house even where, as I have

accepted, those samples did contain very low levels of Baudoinia. The evidence, which I accept, is that the house samples largely comprised darkly pigmented fungi other than Baudoinia but that very low levels of Baudoinia were also present. The photograph (6/9 of process) taken with the sample key card for this location does appear to show a section of harling with darkened patches. The inference being that the darkening seen on that photo must be almost wholly attributable to other fungi. There is no explanation how such low quantities of Baudoinia on the walls have managed to act as a first coloniser to enable a mix of other fungi to visibly take hold. The pursuers did not advance a positive case that very low amounts of Baudoinia at any location could be explained by consumption and succession by other fungi, and there was no experimental evidence of that.

[195] There is, as previously noted, no published scientific research to help prove that Baudoinia has acted on the pursuers' house as a "first coloniser". The pipe experiment does not, for the reasons set out, fill that gap. For these reasons, the pursuers have failed to demonstrate how the presence of Baudoinia has substantially contributed to the discolouration which they complain of. At most, it can be said that the presence of Baudoinia will contribute to some unknown degree along with other darkly pigmented organisms to the blackening seen at the pursuers' property. The pursuers' failure to prove that the blackening was substantially caused by emissions from the bonded warehouses means that the pursuers' case in nuisance fails.

[196] Had I found that the blackening was substantially caused by emissions from the bonded warehouses, it would be necessary to consider whether this amounted to a nuisance. The classic test for nuisance is found in *Watt* v *Jamieson* 1954 SC 56 which involved a dispute between two eminent Edinburgh lawyers, Francis Clifford Watt QC and former MP for Edinburgh Central, and Harvey Morro Jamieson WS. After noting that nuisance as a cause

of action in Scotland was a relatively recent development, Lord President Cooper (at p 57) explained that the proper angle from which to approach a claim of nuisance was the standpoint of the victim. It was irrelevant to defend a claim for nuisance merely on the basis that the defender was making a familiar use of his own property. At page 58, the Lord President stated:

> "The balance in all such cases has to be held between the freedom of a proprietor to use his property as he pleases and the duty on a proprietor not to inflict material loss or inconvenience on adjoining proprietors or adjoining property; and in every case the answer depends on considerations of fact and of degree. I cannot accept the extreme view that in order to make a relevant case of nuisance it is always necessary for the pursuer to aver that the type of user complained of was *in itself* non-natural, unreasonable and unusual. Especially when (as in this case) the so-called 'locality' principle applies, it must be accepted that a certain amount of inconvenience, annoyance, disturbance and even damage must just be accepted as the price the pursuer pays for staying where he does in a city tenement. The critical question is whether what he was exposed to was *plus quam tolerabile* when due weight has been given to all the surrounding circumstances of the offensive conduct and its effects."

The more than tolerable test is applied objectively. In *Maguire* v *Charles McNeill Ltd* 1922 SC 174 at p 178, the Lord Ordinary (Blackburn) noted that the question for him to determine was whether there was a serious additional interference with the physical comfort of such persons of an ordinary standard as may be called on to frequent the complainer's buildings in the discharge of their daily duties. Lord Blackburn at p 181 accepted that several witnesses honestly considered that the noise of the drop hammers from the nearby forge caused serious interference with the neighbouring church and school. Nevertheless, he formed the view that the overall impression given by those witnesses was an exaggerated one. In refusing the reclaiming motion, Lord President Clyde at pp 186-187 noted that the annoyance caused by the claimed nuisance required to be "destructive of the ordinary comfort of life". He agreed with the Lord Ordinary that the evidence led from witnesses for the reclaimer was sincere but "a little overstated". English law also applies an objective test

to determine whether there has been a substantial interference with the ordinary use of the claimant's land, (see *Fearn & Others* v *Board of Trustees of the Tate Gallery* 2023 UKSC 4 at paras [21] and [23].

[197] There are a number of factors to be weighed in the balance in deciding whether discolouration of the pursuers' property, if proved to be substantially caused by ethanol emissions, is more than tolerable. In considering this matter, it is necessary to focus on the effect of the discolouration on the use and enjoyment of this property. The court can have regard to photographic evidence of discolouration on neighbouring properties, such as 30 Woodlea Gardens or Mrs Michie's conservatory or the guttering at the pursuers' neighbours' house, but the critical issue is whether a nuisance has been created at 42 Woodlea Gardens. The evidence of the pursuers was that they find the discolouration of their house to be upsetting. Both appeared genuinely dispirited by the repeated discolouration and the need to arrange for regular cleaning of the exterior of their house. Their evidence on how regularly the cleaning was carried out was imprecise. There was no vouching for when additional cleaning was carried out or precisely what was involved. They had not diarised the nature or times of the work. But I accept that they view the need for such cleaning to be greater than they would expect on a modern house and greater than required on their previous house. Their sense of disappointment with this aspect of their home was supported by the evidence of Mrs Michie and Mr Page in relation to their own houses. I do not accept the suggestion that the pursuers are abnormally sensitive to the discolouration which develops on their home or that their upset has been stoked by campaigning lawyers. However, their response to the development of discolouration and the need for additional cleaning is somewhat difficult to judge objectively since there are

very few photographs of 42 Woodlea Gardens lodged in process to illustrate the extent or development of the discolouration.

[198] There is a single undated photograph of the rear elevation of 42 Woodlea Gardens (6/13 of process) which showed some generalised darkening of the rear wall, but the white window frames appear unaffected. The photograph does not show the roof area, soffits or any PVC downpipes. Mr Highton's report dated 10 May 2021 contains a similar photograph of the rear elevation. A photograph of the front elevation taken from google street view in April 2009 within a report (no 106 of process) appears to show the front elevation of the pursuers' house in very good condition. Marcus Collings' two reports and Alastair Wood's supplementary report contain photographs of the front elevation taken on 13 October 2021, 1 February 2022, 1 November 2024 and 6 November 2024. While some generalised blackening is detectable on the 2024 photographs, the overall condition of the house would not strike a casual observer as unusual. I accept that the pursuers have taken care to ensure that their house is regularly cleaned but that does mean that the limited photographic evidence of the house does not assist the court in understanding the progression of the discolouration. It would have been helpful if a photographic record had been produced of the exterior of the house immediately before and after each major clean. It would also have assisted the court if a photographic record had been taken to show the progression of blackening on an area of the exterior which was deliberately left uncleaned. The absence of a progressive visual record has made it difficult for the court to assess for itself how any discolouration has developed over time.

[199] When considering tolerability, it should be recognised that the ethanol emitted from the defenders' bonded warehouse is not, in itself, a nuisance to the locals. None of the local witnesses described being conscious of ethanol vapour itself in the atmosphere. Any

nuisance evolves over time through the development of dark fungal growths on the exterior of the house or garden fixtures. The evidence before the court was that the fungal growths did not present any health risk to the pursuers. At most, it is an aesthetic blot which, if the householder is unwilling to put up with, requires additional external cleaning to remove from exterior walls. It also creates an unpleasant surface on garden furniture. Unlike some other forms of nuisance such as intermittent loud noises, heavy vibrations or noxious smells, there is not an acute assault on the householder's senses. It presents as recurrent discolouration which builds up over time. On the evidence presented in this case, it does not result in the pursuers' house dropping in value, and the evidence suggested that there remains good demand for houses in Woodlea Gardens.

[200] The fact that the nuisance in this case could be viewed as temporary, in the sense that it can be removed by cleaning, is a factor to be weighed in the balance. However, I do not accept the defenders' submission that the availability of self-help remedies is an important factor in determining whether there has been a substantial interference with the ordinary use of the pursuers' property. The minority judgment in *Fearn & Others* v *Board of Trustees of the Tate Gallery* at paras [214] and [226] considered that in unusual cases, the availability of self-help remedies should be factored into the assessment of whether a nuisance had been created, but the majority did not adopt that approach (see para [83]). The inclusion of self-help remedies within the more than tolerable test would raise difficulties in the present case. In the first place, it will be recalled that the defenders refused to offer assistance with the removal of any discolouration which developed on neighbouring houses after the 2010 planning decision. It would be odd to absolve the defenders from liability on the basis that the pursuers could arrange for cleaning of the discolouration caused by the defenders and which the defenders have previously declined to clean. In the second place, a logically

prior question is whether modest steps could have been taken by the defenders to remove or reduce the ethanol emissions. I would be extremely reluctant to focus on what self-help steps were reasonably open to the pursuers without an equal inquiry into what steps were reasonable for the defenders to adopt to minimise the nuisance. The defenders did not lead any evidence about steps taken to reduce ethanol emissions from their bonded warehouse. As the majority said in *Fearn & Others* v *Board of Trustees of the Tate Gallery* at para [83], the difficulty with a defence based on self-help measures is that it shifts the focus from the principle of "give and take" to "all take" and "all give".

[201] The evidence was that Bonnybridge historically had heavier industry and, in recent years, there has been the development of modern housing developments close to industrial areas. The defenders' bonded warehouses have operated in the area for longer than the residential housing at the Woodlea Estate. While that does not provide the defenders with a defence if their actions create a nuisance, the operation of a warehouse is a well-established feature of the locality, and any nuisance must be assessed by reference to this locality. This locality has mixed residential and light industrial use. The use which the defenders make of their premises is a normal and usual use for an industrial estate in this location. The evidence was that bonded warehouses for maturation are common throughout central Scotland. It is not suggested that the defenders operate this bonded warehouse any differently than bonded warehouses elsewhere. The maturation process is an ancient and well established one. The manner of use at these warehouses is unexceptional. It will be recalled that in *Watt* v *Jamieson*, Lord Cooper declined to hold the pursuer's case to be irrelevant in the absence of an averment that the defender's use of his land was unusual or unreasonable. But a factual finding that a defender is using his land in a common and ordinary way for the locality in question is an important factor against a finding of nuisance

and, indeed, would appear to be a conclusive factor in English law, (see *Fearn & Others* at paras [27] - [30].

[202] There was evidence before the court in the shape of photographs from Alastair Wood that showed significant discolouration on many similar modern houses in towns surrounding Bonnybridge where there is no known source of ethanol vapour. Witnesses' views varied in relation to the extent to which the discolouration was truly comparable. The court does not know how long the discolouration took to develop on those other houses or what cleaning regimes applied. The general point which can be taken from those photographs is that some light-coloured houses in comparable housing developments in the central belt have developed similar discolouration over an unknown period.

[203] I consider that the answer to the question of whether the discolouration in this case falls to be judged as intolerable is finely balanced. I accept that the pursuers describe a cleaning regime which goes beyond what would be expected for a residential house. In particular, the use of bleach on exterior walls every few years is unusual. The development of the discolouration and the cleaning necessitated does affect their normal use and enjoyment of their property. I am not persuaded that the frequency of cleaning described in relation to their patio/sundeck or garden furniture was particularly out of the ordinary for central Scotland. The critical question is whether the discoloration which develops over time on their house amounts to "a material loss or inconvenience" (per Lord President Cooper) or is "destructive of the ordinary comfort of life" (per Lord President Clyde). I have concluded that it does not. I accept that there is a degree of interference with their use and enjoyment of their property, but I am not persuaded that the pursuers have proved that it is of such a degree that it goes beyond what a householder in an urban development close to an established industrial estate can be expected to tolerate.

Where the defenders are using their own land in a common and usual manner for the locality, any additional aesthetical interference with the pursuers' property falls to be regarded as part of the general annoyance or discomfort which a proprietor must accept for their choice of residential location.

[204] For the avoidance of any doubt, although the defenders submitted that the importance of whisky production as a contributor to the Scottish and UK economy should be included as a factor in the tolerability test, I have not taken it into account. The authorities relied upon by the pursuers in their submission support the proposition that an important public interest may be relevant to the remedy granted by the court but is irrelevant to the question of nuisance, (see *Whitty on Nuisance* in the Stair Encyclopaedia at paragraph 73; and *Fearn & Others* v *Board of Trustees of the Tate Gallery* 2023 UKSC 4 at paras [47], [114] – [121]). To hold otherwise would be to oblige a small number of householders to put up with an intolerable interference with the enjoyment of their property while a commercial organisation profits. The oft quoted principle of "the polluter pays" represents common sense with any compensation to householders for an established nuisance forming part of the cost of the eventual product.

[205] If a nuisance had been proved, I would have found the pursuers entitled to damages. Liability for damages resulting from a nuisance requires proof of culpa (*RHM Bakeries (Scotland) Ltd* v *Strathclyde Regional Council* 1985 SC (HL) 17; *Kennedy* v *Glenbelle Ltd* 1996 SC 95). In the context of a claim based on nuisance, culpa can take many forms including malice, intent, recklessness, negligence, knowledge that an action could cause harm or conduct causing a special risk of abnormal damage, (*Kennedy* v *Glenbelle* (supra, Lord President Hope at pp 99-100). Continuing to operate after being made aware of the nuisance can demonstrate a degree of personal responsibility sufficient for culpa in relation

to the continuing nuisance, (*Esso Petroleum Co Ltd* v *Scottish Ministers & Others* [2015] CSOH 21 at para [33]). The defenders knew of the likely link between the ethanol emissions and the discolouration but failed to take sufficient steps to alleviate the problem. The email correspondence from 2002 shows that the defenders in their internal discussions accepted that blackening on the warehouse and on nearby housing was linked to ethanol emissions. They did not know the precise mechanism, but they understood there to be a link. From the material before me, the defenders' public face has been to be distinctly uncurious from that point onwards. The defenders' attitude at the time of the further planning application to extend the warehouses in 2009/10 was that they would not submit any further information to the planning authority on the potential effect of the emissions on local houses. The defenders also declined to consider accepting responsibility for any clean-up costs of nearby houses. In the proof, the defenders led no evidence to show that they investigated any potential changes to their bonded warehouse facilities to reduce ethanol emissions into the atmosphere. Nor did the defenders lead any evidence of engagement with the local community to minimise or remove any possible nuisance. The only employee of the defenders led at the proof had no knowledge of any internal investigations into these issues. While the defenders led evidence from Graeme Littlejohn of the Scottish Whisky Association in relation to the value which the industry placed on corporate responsibility and working to resolve issues with local communities, I would be surprised if the defenders can look back on their engagement with the residents of Bonnybridge as reflecting those values. On this discrete issue, I would have found that the pursuers had proved culpa on the part of the defenders since 2002.

[206] If I had been awarding damages in the present case, I would have made relatively modest awards based on loss of amenity. The claim for diminution in value on the pursuers'

house was not proved. I do not agree with the defenders that the absence of any diminution in value should also result in a finding that there is no loss of amenity. The market value may, in part, depend on the lack of knowledge of potential purchasers of any issues with discolouration, whereas loss of amenity will reflect what an actual purchaser experiences once they live in the house. Had I concluded that the discolouration was a nuisance, I would have awarded general damages for the interference with their use of their house and the loss of enjoyment which the pursuers have experienced due to the need to carry out or arrange for additional cleaning of their property. It has been difficult to extract a clear picture of the frequency and nature of the additional cleaning work necessitated. On the basis that every 2-3 years, the pursuers suffer the upheaval of exterior cleaning lasting a couple of days, I would have valued the loss of amenity at £500 per annum. As a cross-check on this value, Mr Page incurred bi-annual costs of around £200-300 to clean the exterior parts of his own house. Annual compensation of £500 would enable a householder to have the exterior of their house cleaned on an annual basis along with a modest sum to compensate for the upheaval caused by such cleaning. That would provide the householder with a reassurance that their house will largely remain free of an unsightly discolouration at all times. Although there was evidence that the pursuers did not experience any issues in the first year or two, and that the problems increased after the further warehouses were added, I would have adopted a broad axe in awarded £500 per annum for each year from 2002-2026 which amounts to £12,000. Accrued interest would amount to £11,520. I would have made no award for future loss of amenity as (i) the nuisance could be abated in the future, and (ii) the pursuers may not remain as proprietors. It remains competent for a further action of damages to proceed in the case of a continuing nuisance, (*Stevenson* v *Pontifex & Wood* (supra)).

[207] It was also submitted that damages should be awarded on the basis of estimated additional cleaning costs paid by the pursuers. The defenders argued that the pursuers had failed to prove a benchmark of normal cleaning costs which could then be used to calculate additional cleaning costs. I do not agree that the cost of cleaning claim fails on that basis. The notion of establishing a benchmark for average cleaning costs of a particular house is easy to state in theory but is likely to prove elusive in practice. The problem with the pursuers' claim for cleaning costs is the more prosaic one that they have produced no vouching. There were no receipts in relation to these costs. For an action which has been progressing slowly through the court system for over a decade, it was unusual that at least some receipts were not retained and produced by the pursuers. The court is entitled to expect some degree of vouching for costs claimed by a pursuer or a reasonable excuse why such vouching is not available. I would not have made any award of damages for past or future cleaning costs in the absence of vouching.

Disposal

[208] I shall sustain the second plea-in-law for the defenders; repel the first to third pleas-in-law for the pursuers; and grant decree of absolvitor. I shall reserve all issues of expenses meantime.