

SUPREME COURT OF QUEENSLAND

CITATION: *R v Omid (No 2)* [2012] QCA 363

PARTIES: **R**
v
OMID, Arnesa
(appellant)

FILE NO/S: CA No 146 of 2012
DC No 173 of 2010

DIVISION: Court of Appeal

PROCEEDING: Appeal against Conviction

ORIGINATING COURT: District Court at Brisbane

DELIVERED ON: 19 December 2012

DELIVERED AT: Brisbane

HEARING DATE: 22 November 2012

JUDGES: Margaret McMurdo P and Muir and Gotterson JJA
Separate reasons for judgment of each member of the Court, each concurring as to the orders made

ORDERS: **Appeal is allowed, guilty verdicts are set aside, and instead, verdicts of acquittal are entered on each count.**

CATCHWORDS: CRIMINAL LAW – APPEAL AND NEW TRIAL – VERDICT UNREASONABLE OR INSUPPORTABLE HAVING REGARD TO EVIDENCE – where appellant convicted of arson and attempted fraud of his insurer – where the entirely circumstantial prosecution case was that the appellant intentionally set fire to his house using petrol as an accelerant and then made a fraudulent insurance claim – where the appellant had purchased a lawnmower, petrol can and petrol two days before the fire – where the appellant's wife testified that he had mowed her lawn a day or so before the fire and that the mower and petrol were at her house – where petrol can was not found at the scene of the fire – where petrol traces were detected on the clothing he was wearing at the time of the fire – where the appellant attempted to put out the fire with a garden hose until the fire brigade arrived – where the appellant was in the process of renovating the old house and had recently had the skirting boards painted and floors sanded and varnished – where the appellant was financially secure – where prosecution expert witnesses gave evidence that the fire started in the lounge/dining room as a result of the ignition of petrol spread

on the floor – where samples were taken of skirting boards and floor debris to be tested for petrol – where prosecution expert witnesses gave evidence that the samples indicated presence of petrol – where appellant gave evidence denying arson and explaining the fire started when he was in the shower – where he gave evidence that he unsuccessfully tried to extinguish the fire near the kitchen – where the appellant said he had suffered burns to his hands, put on his dirty clothes retrieved from the bathroom floor and jumped out the bathroom window, leaving his wallet and car keys – where the appellant's expensive tools were under the house and his late model Mercedes Benz was in the driveway – where the appellant's expert witnesses testified that the fire may have started through an electrical fault and may have started in the kitchen, and that the method used in collecting samples was flawed – where the appellant's expert witnesses gave evidence that the prosecution test results of the samples taken may be consistent with solvents, varnishes or paint – where the presence or absence of petrol in the fire debris was fundamental to the jury verdict – whether the jury verdicts were unreasonable having regard to the whole of the evidence

M v The Queen (1994) 181 CLR 487; [1994] HCA 63, cited
Plomp v The Queen (1963) 110 CLR 234; [1963] HCA 44, cited

R v Hillier (2007) 228 CLR 618; [2007] HCA 13, cited

COUNSEL: P E Smith with K Hillard for the appellant
 S Vasta for the respondent

SOLICITORS: Fisher Dore Lawyers for the appellant
 Director of Public Prosecutions (Queensland) for the respondent

- [1] **MARGARET McMURDO P:** The appellant, Arnesa Omid, was convicted on 6 June 2012 after an eight day jury trial of arson of his Brisbane house and attempted fraud of his insurer on 16 January 2009. He has appealed against his convictions contending that the verdicts should be set aside on four grounds. The first is that the verdicts were unreasonable. The second is that there was a miscarriage of justice in the reversal of the onus of proof which could not be overcome by directions by the trial judge. The third is that the trial judge erred in allowing the prosecutor to cross-examine defence witnesses about failing to provide comparison samples. The fourth is there was a miscarriage of justice when the prosecutor raised matters in his closing address which were not put to the appellant in cross-examination. Before discussing these grounds of appeal, it is necessary to understand the relevant evidence at the trial.

The evidence at trial

- [2] The prosecution case, which was entirely circumstantial, was that the appellant intentionally set fire to his house at Archerfield, using petrol as an accelerant and that he then made a fraudulent insurance claim. The house was insured for

\$185,000 and the contents for \$40,000. The insurance policy was for replacement only. Prosecution expert witnesses gave evidence that the fire started in the lounge/dining room as a result of the ignition of petrol spread on the floor. They contended that samples taken from the scene detected the presence of petrol.

- [3] The appellant had purchased a lawnmower, petrol can and petrol two days before for which receipts were found unconcealed in the console of his car. Photographs of the kitchen, lounge and dining room were found on his mobile phone. Petrol traces were detected on the clothing he was wearing at the time of the fire. No petrol container was found at the scene. The appellant jumped from the burning house leaving behind his wallet and the car keys to his late model Mercedes Benz which was parked in the driveway. He attempted to put out the fire with a garden hose until the fire brigade arrived.
- [4] Police spoke to him at the hospital. He told them he ran a business from home and drew a map of the house contents which included two rugs on the floor of the lounding/dining room. At this stage, he had not been informed of the position of the fire damage. He was concerned about his expensive tools which were located under the house. He told police that he was renovating and the floor had been recently sanded and polished. The mower and petrol can were at his wife's house from whom he was then separated. The investigating police were aware that a previous tenant had been evicted some time before the fire. The police conducted a formal interview with the appellant on 24 April 2009. The appellant was co-operative and denied lighting the fire.
- [5] The appellant gave evidence at trial to the following effect. He bought the house as an investment property in 2006. It was 30 to 40 years old. It had not been rewired. The tenant who rented the property complained about electrical faults on a number of occasions. The appellant had these matters attended to by an electrician. He supported this evidence with emails and invoices. The tenant installed his own air conditioner without the appellant's permission and took it with him when he was evicted. The appellant explained that he purchased a lawnmower, petrol can and petrol two days before. He was then separated from his wife but they were on good terms. He mowed her lawn the day before the fire and the mower and petrol can were at her house some distance from Archerfield. His wife gave evidence confirming this.
- [6] He was living in and renovating the Archerfield house at the time of the fire. He had installed smoke alarms. He had recently had the interior painted, including the skirting with glass enamel. Only days before the fire he had the floor sanded and polished. He supported this evidence with receipts and bank records. He was in a sound financial position with a prosperous business as a construction project manager and owned the house outright. On the day of the fire he put bread in the toaster whilst he had a shower. He heard sounds like breaking glass and came out to discover the fire around a lounge chair in the lounge/dining room near the kitchen. He unsuccessfully tried to put out the fire with a rug, burning his hands. He quickly put on the clothes he had been wearing the day before which were on the bathroom floor and jumped out the bathroom window. He tried to put out the fire with a garden hose. He was concerned about his expensive tools which were stored under the house and his car in the driveway.

- [7] He was subsequently required to demolish the house because it contained asbestos. He has since rebuilt the house.
- [8] The appellant also called expert witnesses who gave evidence that the fire may have commenced through an electrical fault and may have started in the kitchen, not the lounge room. They also considered that the prosecution witnesses' evidence that samples taken from the floor boards and skirting contained petrol were not conclusive. The readings obtained may have been consistent with varnish, solvents or thinners, rather than petrol.
- [9] The primary judge helpfully identified in his directions to the jury the fact that the presence or absence of petrol in the fire debris was fundamental to their verdict. The parties agreed at the hearing of this appeal that this was the key issue. If the jury should have had a reasonable doubt about whether petrol was present in the samples taken from the floor and skirting, then they could not exclude the reasonable hypothesis consistent with innocence that the appellant did not deliberately light the fire with an intention to defraud his insurer. They could only convict him of both counts if satisfied beyond reasonable doubt that he used petrol to light the fire.
- [10] The prosecution expert witnesses on this aspect of the case were Mr Murray Nystrom, Senior Sergeant Andrew Rowan, Mr Craig George and Mr Gary Asmussen.
- [11] Mr Nystrom gave the following evidence. He was the sole director and principal of Australian Forensic Pty Ltd. He had a Bachelor degree in Applied Science with a major in Chemistry and was a senior associate of the Australian and New Zealand Insurance Institute by examination, designated a chartered insurance professional. He was a member of the Institution of Fire Engineers of the United Kingdom and of the American Academy of Forensic Sciences and a Fellow of the Institution of Australian Professional Investigators. He was a chartered chemist by designation from the Royal Australian Chemical Institute and a Fellow of the Royal Australian Chemical Institute. He commenced forensic work in 1977 at the Queensland Police Service, leaving in 1988 to take up his present career. He had examined in excess of 4,000 scenes of fire throughout Australia and the Pacific.
- [12] In his opinion, the fire initiated in the lounge room after being deliberately lit by the ignition of petrol. This followed from the substantial damage to the floor area and the ceiling above the lounge room which showed there had been flashover there at some stage. Flashover occurs when a fire burns fuel so fiercely that a hot gas cloud forms at the top of the room, radiating energy downwards to cause everything below it to ignite. Flashover occurs at about 600°C at energy levels of 20Kw per square metre. The pattern of burn marks through the floorboards in the lounge room showed deep charring which he considered was caused by a long duration of or an energetic fire there. The timber in the lounge and dining room was effectively destroyed, whereas there was much less damage in the kitchen. For that reason, he considered the fire was unlikely to have commenced in the kitchen. He did not consider the fire could have started in the entertainment appliances in the lounge room. They were far too damaged for a thorough examination but there were indicia within their carcasses that they were remote from the initial fire. There was no evidence of fire spreading from that corner of the house. There was no V-pattern on the wall and no fire damage on the floor close to the television.

- [13] Nor was there any evidence of fire starting at the kitchen fridge. He considered the left half of the front door was open during the course of the fire developing because of the fire patterns on the doors. The door on the right side of the fridge had been closed during the fire. He did not consider the two power outlets in the living room were the source of the fire. The fire had spread from the dining room to the kitchen. The toaster in the kitchen was not the source of the fire. The bread in the toaster had not been totally consumed; the plastic base was not totally destroyed; and nor was there any sign of fire beneath the toaster. There was no fuel around the toaster from which an initial fire could have progressed. A flashover had occurred in the kitchen but the kitchen cupboards maintained their integrity. This was consistent with a less intense fire than in the lounge room. The fire damage under the metal cabinet in the kitchen where the toaster was located was of a low order of oxidisation. There was broken glass in the bottom of that cabinet.
- [14] He took five samples, each containing a mix of flooring and skirting from the threshold in front of the French doors; each side of the hallway; and from each lounge room wall. He analysed them using a gas chromatograph mass spectrometer. Samples 1, 2, 4 and 5 contained a complex mix of aromatic compounds which are the major background components of fuel petrol. The reading matched the toluene to tetramethylbenzene range required for petrol. Sample 3 had only a trace level of petrol. The origin of the fire was, in his opinion, the lounge room and its cause was the deliberate ignition of petrol which had been poured on the floor. His findings that samples 1, 2, 4 and 5 contained petrol were critical to that conclusion.
- [15] In cross-examination, he agreed that he was appointed by the insurer to investigate the fire. In his first report he stated that the lesser degree of matting in a conductor seen above the southern part of the living room may have been the result of electrical activity. He initially concluded that there was human intervention in the fire but was unable to say if it was deliberate or accidental. He initially observed that the evidence was inconclusive as to whether flammable liquid had been spread on the living room floor. He had since reconsidered the matter and that was no longer his view.
- [16] He found no petrol can at the scene and no evidence of bottles of alcohol exploding. He agreed, however, that the glass shards in the cabinet above the toaster were consistent with bottles rupturing in the fire. He did not think there had been a fireball (an airborne ball of flaming gas) in the kitchen. He did not recall seeing the tops of any bottles. The irregular burn pattern on the lounge room floor could be produced by the presence of furniture and rugs, not necessarily petrol.
- [17] In re-examination he said that the fire did not start in the fuse box under the house, noting the absence of any damage to the underside of the floor near the fuse box. Each of the floor samples he took contained a sample from the skirting. Had an accelerant been used it would have seeped into the area between the skirting and the floor timber and become protected. Had an accelerant not been used and the fire in the lounge room simply commenced by items like a couch catching fire, the fuel patterns would generally reflect the fuel load of the couch. As the couch was consumed by the fire, the floor underneath it would also be consumed. The foam cushioning in lounge chairs and couches is highly combustible and will burn energetically, comparably to petrol or kerosene. Unlike couches, rugs do not provide a good fuel load unless made of a highly combustible material.

- [18] Mr David Kneipp, the claims manager with the appellant's insurer in cross-examination agreed that QBE Insurance had paid Mr Nystrom's fees for an earlier court appearance in this matter.
- [19] Mr George had worked as a fire investigator with the Queensland Fire & Rescue Service for 12 years and as a fire officer in the QFRS for 32 years. He had an Advanced Diploma in Public Safety, a Diploma in Fire Scene Examination and a Diploma in Fire Investigation. He had attended and investigated several hundred fire scenes. In his opinion, the fire originated near the centre of the lounge room but he could not say where. He eliminated electrical appliances in the lounge room as the source as there were none in that area. The cause was non-accidental because there was no accidental ignition source in the centre of the room. The distinct areas of charring on the lounge room floor and in the large wooden beams overhead were consistent with that area being the source of the fire. The staples in some areas of the lounge room were consistent with pieces of furniture being totally consumed by fire. A heater on the back wall was not the cause of the fire as there was no V-pattern above it.
- [20] The fire moved from the lounge room to the kitchen. He found a clear area inside the kitchen door where the floor was undamaged.¹ The absence of damage may have been because of deeply pooled liquid, perhaps an accelerant. He considered the fire travelled from the dining room towards the cupboard over the toaster. He eliminated the toaster as a source of the fire as there was no V-pattern around it. The bench top was fairly well intact. The stove was not the source of the fire because there was no damage behind it. The fire in the kitchen was much less intense than in the lounge room. There was no evidence the fridge caused the fire. The photograph ex 94 showed a damaged dining room chair. This suggested the fire damage came from the bottom towards the top, consistent with the fire originating in the lounge room not the kitchen. The photograph ex 95 showed an area burned through near the back door and on the back verandah. He was unable to explain why this area burned, as there were no furniture remnants there.
- [21] In cross-examination, he expressed his opinion that there was no flashover near the kitchen cupboards whereas there was clear evidence of flashover in the lounge room and the hallway. He disagreed that a rug might caused the T-pattern on intact floor boards in the lounge room.² His expertise was not in microscopically examining the wiring and conducting electrical sampling and testing. Initially, he reported that he was unable to determine the point of origin of the fire, although he thought it was towards the centre of the lounge room. He was unable to say whether the front doors were open during the fire. His initial view was that human intervention in causing the fire could not be categorically excluded. He accepted that the evidence of the burn patterns alone did not show the use of an accelerant. If there were rugs on the lounge room floor and there had been flashover, the rugs may have protected the floor and caused the T-pattern. He did not accept that the fire started in the kitchen. He agreed that the fuel load was greater in the lounge room than in the kitchen. He did not consider there was any significant fire in the area of the toaster and the kitchen cupboard above it. The unburnt area on the kitchen floor could have been caused by liquid from the refrigerator or something protecting the area such as a tea towel rather than pooled accelerant. The holes in the kitchen wall were likely to be from the flashover in the lounge room rather than from any kitchen fire.

¹ Ex 88.

² As depicted in the floor plan, ex 105.

- [22] Senior Sergeant Andrew Rowan was the officer in charge of the Fire and Explosion Unit, Brisbane Scientific Section, Queensland Police Service at the time of the fire. He had 17 years forensic experience which included the examination of many fire scenes. He had a Bachelor of Applied Science, a Diploma of Forensic Investigation and a Master of Science in Forensic Science.
- [23] He attended the fire scene at about 10.45 am on 16 January 2009. In his opinion, the fire originated predominantly in the lounge room and was the direct result of human involvement with applied accelerant. The damage to the floor and overhead indicated a large fuel load in the lounge room. There was a protected pour or pooling pattern inside the kitchen door.³
- [24] There was much less fire damage in the kitchen than in the lounge. All fire patterns led towards the kitchen; there were none leading from the kitchen. If a fire started in a lounge chair it could not have caused the burning through of the floor. He conceded, however, that there were many variables and this was a difficult assessment. Gaps between the floor boards could introduce oxygen and cause a fiercer fire. He did not know if the rear lounge room window was open at the time of the fire but the front door appeared to be closed. He did not find the remains of any rugs but nor would he expect to in light of the extent of the fire damage. Parts of the lounge room floor may have been protected by rugs.
- [25] He discounted the lounge room air conditioner as the source of the fire as there were no preferential burn marks around it and the fire was not slow burning. The fact that the timber floor was burned through did not mean that accelerant had been used. He considered the kitchen was the last room reached by the fire. The damage to the stool in the corner of the kitchen⁴ indicated the fire had come into the kitchen through that doorway. Neither the toaster nor the kettle was the origin of the fire as there was no fire progression from the toaster throughout the room. He found no evidence of exploded bottles of alcohol or of any violent failing of a container. He found no fragments of glass. There had been a flashover in the kitchen but at a later stage than the one in the lounging/dining room.
- [26] He took a sample from the skirting on the lounge room side of the kitchen wall near the pour pattern (his sample 8). He noted the pour pattern on the kitchen floor and agreed that it could have been caused by material covering and protecting the floor. He took his sample 5 from the solid flooring under the window in the lounge room where the staples and remains of the lounge were found.⁵ Apart from his samples 5 and 8, all his other samples were taken at the edge of the consumed floor in the lounge room. None of the samples from the lounge floor boards near the burn patterns contained petrol. He marked on a sketch map the areas where he took these samples.⁶
- [27] Under cross-examination he said he did not take samples from the pour pattern in the kitchen because the floor had been hosed down. In his first report on 16 January 2009, he noted that the large rugs in the lounge room may have influenced the burn patterns on the floor. He was then unable to determine the cause of the fire and could not eliminate the possibility of an electrical fault in the area of the entertainment unit. Mr Asmussen's finding of petrol in his sample 8 was the key reason for his change of opinion.

³ Ex 88.

⁴ Ex 94.

⁵ Ex 86.

⁶ Ex 105.

- [28] Sometimes a fire investigator could smell petrol but that was not possible here because the heavy contamination of asbestos prevented "sniff" testing. There was no microscopic examination of the house's electrical wiring as there were no concerns about it. The entertainment system in the lounge was destroyed and he could not exclude it as a source of the fire. He agreed that the position of the rugs as in a plan drawn by the appellant⁷ would protect part of the lounge room floor. He believed the rear door was closed at the time of the fire. He agreed it was important to take samples from the middle of the floor not just the skirting. The fire damage to the stove and other kitchen items was from above. He did not recall seeing broken bottles in the kitchen cupboard. He agreed that a spirit explosion could cause a fireball. Most containers would fail in a fire without any major violence or explosion, the lids failing before the glass. He rejected the theory that the fire started in the toaster causing bottles of alcohol to explode in the kitchen cupboard above, resulting in a fireball igniting the lounge room. The cabinet above the toaster showed a burn pattern from the toaster up to the cabinet.
- [29] In re-examination, he re-affirmed that he found no evidence of a vapour type explosion in the kitchen. In the absence of a fuel trail, a fire could not have spread quickly from the toaster to the lounge room area unless the rugs in the dining room were highly combustible.
- [30] Mr Gary Asmussen, the principal forensic scientist, Analytical Services Unit, Scientific Section, Queensland Police Service, had a degree in Applied Science majoring in Applied Chemistry and a Masters degree in Environmental Management. His duties included the analysis of fire debris samples. He analysed a total of 15 samples taken primarily from the house, together with the appellant's clothing. The appellant's torn black and white shirt which he was wearing when he jumped from the house tested positive for an ignitable liquid residue which he could not identify. He tested the floor and skirting samples taken by Sergeant Rowan. Only sample 8 (the skirting sample) showed the presence of recently applied petrol in its second testing resulting in the chromatogram shown in ex 116.
- [31] In cross-examination, he agreed that the light to medium aromatic product detected in the appellant's clothing was not necessarily petrol. He also agreed that his evidence in this trial was the first time he had expressed the view that petrol was found in sample 8 and that it had recently been applied; he did not give this opinion in his earlier report or evidence. His second testing of sample 8 showed the presence of toluene, of xylene, and of trimethylbenzene. He disagreed that this reading could be consistent with a solvent; it was consistent with petrol. He disagreed that the American standards required the presence of both alkanes and naphthalenes before positively designating a substance as petrol. He could not say whether, had sample 8 been varnished within three months, it may give the same analytical results as if it contained petrol. To answer that question he would need to know the type of varnish or solvent system used. Varnish was a very open general term for clear coatings. He was unable to find any product in present use which contained materials which would lead to such a reading which was indistinguishable from petrol. He agreed that investigators usually took reference samples of undamaged polished flooring and painted skirting with which to compare the suspect samples and that was not done here. Had it been, the readings from the reference samples could have been compared to the suspect samples. He did not

⁷ Ex 57.

consider that Shellsol A and B had common components of petrol and would not classify either of them as petrol.

- [32] The appellant called two expert witnesses as to the possible causes of the fire and the analysis of sample 8 as containing petrol: Dr Walter Stern and Mr Anthony Cafe.
- [33] Dr Stern had a Bachelor of Science and a PhD in Chemistry and was head of the Department of Chemistry at the University of Technology Sydney for 18 years where he was a professor. At the time of the trial he worked as a consultant in chemistry and forensic science. He was a Fellow of the Royal Australian Chemical Institute and a member of the Institute of Arson Association International. He had written many scientific papers and was the editor of the journal of the Australian Association of Fire Investigators. He had 20 years experience conducting laboratory analysis of samples taken from fire scenes and analysed hundreds of samples taken from petroleum and petroleum products. He had worked for insurance companies, the police force and defendants.
- [34] There were many possible accidental causes of fire and in assessing the origin of a fire and its causes it was important to eliminate accidental causes. He examined the many exhibits in the present case (these included over 100 photographs of the scene; plans of the scene; Mr Nystrom's chromatograms; and Mr Asmussen's chromatograms). The fire was most intense in the lounge room but that did not mean it started there. Flashover can destroy fire patterns and make the fire more difficult to assess. Ventilation and fuel load were keys factors in the intensity of a fire. Petrol can cause a rapidly spreading fire but it is not the only mechanism. He referred to the Lime Street fire experiments where igniting a couch produced a fire of the same intensity and caused similar floor damage as when petrol was used. He formed the opinion that the damage in the lounge room could be due either to accelerants being poured around and ignited or to a fire emanating from an electrical source in the lounge room. As to the fire patterns and the burn-through in the lounge room floor boards, this could be explained by parts of the floor being covered by a rug and providing some protection.
- [35] He considered there had been a flashover in the kitchen but one of less intensity than that in the lounding/dining room. There was no evidence of a fuel trail which he considered would be present if an accelerant had been poured on the floor. The so-called pour pattern on the kitchen floor⁸ did not seem to have been caused by a pool of accelerant as any accelerant would have evaporated in the fire and the floor was likely to have been damaged. The mark may have been caused by the area being protected by a tea towel or debris from the ceiling. Sampling in this case should have been taken from around the edge of the pour pattern because the surrounding charcoal would have absorbed any petrol. The washing down after the fire would have diluted but not removed the petrol because the charcoal would have absorbed it. The fire could have started in the kitchen. It was not possible to determine where the fire originated. Certainly the most intense fire was in the lounge/dining room area but that intensity could have been caused by the fuel load from the burning lounge chairs. The kitchen flashover appeared to have occurred later than that in the lounge room. There was more unburnt material in the kitchen which showed it was less intense.

⁸

Ex 88.

- [36] Electricity was a common cause of fire. He could not exclude all possible causes of accidental fire in this case. It may have been caused by an electrical fire or by a fire in the toaster. Toaster fires can accelerate within minutes. An electrical fire could not be eliminated because of the extent of fire damage to the house and because no electrical engineer conducted a thorough investigation. He noted that initially Senior Sergeant Rowan considered that electrical fault could not be excluded as a cause. This was not a new house and it could have had electrical problems resulting in the fire.
- [37] He referred to Mr Asmussen's analysis of the appellant's clothing. Light to medium aromatic compounds do not contain many of the components of petrol; they are chemicals which are in petrol but also in other materials.
- [38] As to Mr Asmussen's analysis of Senior Sergeant Rowan's floor samples, Mr Stern noted that seven samples taken from the floor boards in the lounge room area returned negative results for petrol. If an accelerant had been spread on the lounge room floor, traces of petrol should have been found in these samples. It was also significant that no initial investigator reported any odour of an accelerant. As for sample 8 from the skirting, the chromatogram⁹ showed one peak of toluene, three peaks of xylenes and five peaks of trimethylbenzenes. These chemicals are amongst the components of petrol but it could not be said from that reading that the sample 8 contained petrol. Petrol had over 200 components. The peaks in this analysis were a comparatively small number of components. Had it been petrol he would have expected to find the presence of naphthalene. The presence of the chemicals identified in the chromatogram were present in petrol but were also present in many other solvents. As there was no naphthalene present, he did not consider sample 8 was petrol. It could be a paint or lacquer thinner, a paint or lacquer solvent, varnish or an enamel paint. He was shown Shell Chemicals' material safety data sheet for the product Shellsol A100, an industrial solvent.¹⁰ This product had similar peaks in its reading to those found in sample 8, with the xylenes and trimethylbenzenes in the same ratios. He stated in strong terms that in his opinion it was unlikely that sample 8 contained petrol. Control samples of skirting from an area of the house well away from the fire would have been valuable to test for the presence of solvents. Varnish can go behind skirting through capillary action and can last for some months.
- [39] Dr Stern was taken to Mr Nystrom's samples, four of which he found contained petrol. None of Mr Nystrom's four readings contained toluene. The only petrol components were three peaks of xylenes and five peaks of trimethylbenzenes. There were no significant naphthalenes present. The absence of toluene means these samples could not be matched and did not appear to be petrol. They could be a solvent. According to American standards, the analysis of these samples did not allow a finding of petrol. In any case, he would not have mixed samples of areas of burnt flooring with skirting as Mr Nystrom did. The skirting samples should have been taken and kept separately from the flooring samples. There was a possibility that some product had accumulated in the skirting long before the fire and that, whatever this was, it was not on the floor boards at the time of the fire.

⁹ Ex 116.

¹⁰ Ex 149.

- [40] When shown the chromatographic analysis of varnished wood and petrol,¹¹ he agreed that the chromatogram of varnished wood had a number of similar components to the chromatogram of petrol.
- [41] He could not give a cause of the fire in this case. But he was unpersuaded that the cause was the lighting of accelerant in the lounge room. Possible causes included the toaster or an electrical fault in the lounge room.
- [42] In cross-examination, he agreed that charcoal around a pour pattern would not necessarily absorb an accelerant, but the tests for accelerant were very sensitive. Toluene can form in fires by the burning of other material like plastics. Whilst the most severe floor damage was in the centre of the lounge room and there was corresponding heavy damage on the ceiling, the area of most intense damage did not necessarily indicate the origin of the fire. Flashover patterns can be haphazard and chaotic. He did not test varnishes to compare them to petrol because there were so many different varnishes available. The scenario of the toaster catching fire and causing bottles of alcohol to explode was possible, though improbable. He could not discount the ignition of petrol poured on the lounge room floor as the source of the fire.
- [43] Mr Anthony Cafe was a forensic scientist with a Bachelor of Applied Science with honours in Applied Chemistry and a Masters degree in Applied Chemistry. He was a member of the Royal Australian Chemical Institute. His principal area of practice was the investigation of fires to determine cause and origin. He had investigated approximately 2,500 fires in buildings, cars and boats. He had analysed about 2,500 fire debris samples. He was a member of the New South Wales police panel of expert witnesses and the New South Wales Legal Aid panel of expert witnesses. He had given evidence in Australia and internationally.
- [44] In his opinion, there was credible evidence that this fire started in the toaster. The burnt toast was near the toaster's element. The fact that bread remained in the centre of the toast did not conclusively rule out the toaster as the source of the fire. The charcoal on the outside of the bread would protect it. There was a burn mark on the metal cabinet above the toaster. Glass bottles of alcohol inside that cabinet could have exploded and the fire may have spread to the lounge room. Bottles of alcohol could explode in a fireball. Material on top of the fridge had also burned. The mark on the kitchen floor¹² was not a pour pattern. Had flammable liquid been poured there, it would have ignited in the fire. The pouring of a significant amount of flammable liquid onto the floor would have left an odour which would have been detected at the scene.
- [45] If the fire had started in the lounge room it would have spread to the dining area, not wrapped around back into the kitchen. The burn holes in the lounge room floor did not appear to be a pour pattern. As no positive results came from any of Senior Sergeant Rowan's samples taken from the lounge room floor boards, the safest conclusion was that there was no evidence of accelerant in the lounge room. It was prudent to test around the skirting for the presence of an accelerant because of capillary action, but it would be advisable to take a control sample for comparison. The control sample would show whether any solvents had been used in the floor varnish or the skirting paint. From his experience working for a large chemical

¹¹ Ex 157.

¹² Ex 88.

company, he knew that the constituents of varnish and solvents often changed. He produced a chromatogram analysis of varnished wood and petrol¹³ which showed these similarities.

- [46] As to Mr Nystom's sample results, these showed xylenes and trimethylbenzenes, which were components of petrol. But these were also components of varnishes and paints. The simplest way of determining whether this was a varnish would have been to take a control sample of the skirting at the scene. As to Senior Sergeant Rowan's samples, there was only one positive sample and that came from the skirting (sample 8). The presence of toluene, xylenes and trimethylbenzenes in sample 8 was consistent with components of evaporated petrol but was also consistent with components of material used in paints and varnishes. Aromatic products like petrol on clothing could remain for days.
- [47] In cross-examination, he agreed that although varnished wood had a similar chromatogram pattern to petrol, they were certainly distinguishable. A control sample taken from an unburnt area of floor or skirting would have shown the constituents of the varnish used on the floors and the suspect samples could have been compared to the control samples.
- [48] Had bottles exploded in the kitchen, he would have expected to see shards of glass and he did not, but they were often hard to detect. He would not necessarily have expected structural damage to the metal cabinet above the toaster. He agreed that for his hypothesis to have occurred there would have had to be a fire of some intensity from the toaster or from another fire source near a nearby power point sufficient to cause the bottles of alcohol in the cupboard to explode into a fireball which went through the kitchen wall. The most severe fire damage was to the floor in the lounge room and to the ceiling above it. But this damage was not conclusive proof of the fire's origin. The damage depended on fuel load and ventilation. He agreed that the holes in the floor of the lounge area could be consistent with the use of accelerant.

Were the guilty verdicts unreasonable?

- [49] The appellant contends the jury verdicts were unreasonable and against the weight of the evidence. This ground of appeal requires the Court to review the whole of the evidence and to then determine whether a jury could be satisfied beyond reasonable doubt of the appellant's guilt. Due weight must be given to the jury's important role in the criminal justice system. But if, after reviewing the whole of the evidence, the appellate court considers there is a significant possibility that an innocent person has been convicted, the appeal must be allowed: see *M v The Queen*.¹⁴ In a circumstantial case like this, the jury could only convict the appellant if satisfied that no explanation other than guilt was reasonably open on the evidence: *Plomp v The Queen*,¹⁵ *R v Hillier*.¹⁶ In considering that issue, the appellate court must look at all the evidence in the circumstantial case and not consider items of circumstantial evidence piecemeal: *Hillier*.¹⁷
- [50] I agree with the trial judge's assessment in his directions to the jury, accepted by the parties in this appeal, that unless the prosecution proved beyond reasonable doubt

¹³ Ex 157.

¹⁴ (1994) 181 CLR 487, 493-5 (Mason CJ, Deane, Dawson, Toohey JJ).

¹⁵ (1963) 110 CLR 234, 243 (Dixon CJ).

¹⁶ (2007) 228 CLR 618, 637, [46] (Gummow, Hayne and Crennan JJ).

¹⁷ Above, 637-638 [47]-[49].

that petrol was poured around the lounge room floor, the appellant should not have been convicted. The remaining evidence in combination could not support a guilty verdict.

- [51] The respondent contends that Mr Nystrom's analysis of the samples he took and Mr Asmussen's analysis of the samples taken by Senior Sergeant Rowan prove beyond reasonable doubt that the appellant placed petrol in the lounge room area and ignited it, burning the house with the intention of defrauding his insurer. The evidence of the prosecution investigators is consistent with this hypothesis. The contradictory hypothesis suggested by the defence witnesses was implausible. The evidence of the defence experts could and should be rejected. It was not put to Mr Nystrom that his findings of petrol in his samples were wrong. The appellant placed much emphasis on a control sample. The respondent emphasised that Senior Sergeant Rowan's sample 5 was effectively that control sample as it was taken from under the couch where petrol would not have reached. It tested negative. It followed that if what was found in sample 8 was varnish then it could be expected that sample 5 would also have had that reading. The prosecution hypothesis was so strongly established by the evidence in its case that it could be accepted beyond reasonable doubt as excluding all other possible hypotheses consistent with innocence.
- [52] The judge told the jury that Mr Nystrom's method of taking samples which contained both flooring and skirting raised concerns about whether his readings which he considered showed petrol came from the skirting component rather than the floor component of his samples. It followed that he had no samples from areas of floor board without skirting which contained petrol. The different results reached by Sergeant Rowan and Mr Nystrom were likely to be caused by Mr Nystrom mixing his samples of floor board and skirting.
- [53] I share his Honour's concerns. I do not consider that Mr Nystrom's evidence could be relied on in this case as demonstrating that the samples he took and tested established beyond reasonable doubt that petrol was poured on the floor. The uncontested evidence was that floor varnish or enamel paint through capillary action may have been stored in the skirting for some months. As the judge explained to the jury, Mr Nystrom's samples contained both skirting and floor. By contrast, seven of Senior Sergeant Rowan's samples were floor areas around the burnt-through lounge room and sample 8 was from skirting. He did not mix his floor and skirting samples. All Senior Sergeant Rowan's samples taken from the lounge room floor tested negative for petrol. There was, as the primary judge explained to the jury, a real risk that Mr Nystrom's floor samples which all contained skirting could have given a result indicating what was on the skirting rather than the floor. This aspect of his evidence was therefore of questionable reliability.
- [54] The respondent has placed emphasis on the fact that Senior Sergeant Rowan's sample 5 was taken from solid floor boards underneath a burnt couch where petrol would not have been poured onto the floor. It was effectively the control sample which Dr Stern and Mr Cafe both considered was desirable. But the photograph of the area from where sample 5 was taken¹⁸ does not show a varnished floor suitable as a control sample. The floor there may not have been burned through as in other areas of the lounge room but it was certainly badly charred. The varnish may well have been burned off. Sample 5 was not a control sample. In any case, the point is

¹⁸ Ex 86 and see also the sketch-plan marked with where the samples were taken, ex 105.

something of a red herring. The critical question is whether Mr Nystrom's evidence that his testing of his samples showed the presence of petrol and Mr Asmussen's evidence that his testing of sample 8 showed the presence of petrol can be accepted beyond reasonable doubt. If there was petrol in the skirting the reasonable inference was that it got there by way of capillary action from petrol on the floor which had been burned off in the fire.

- [55] There was a clear conflict between the evidence of the appellant's expert witnesses Mr Cafe and Dr Stern, and the prosecution's expert witnesses, Mr Nystrom and Mr Asmussen, as to whether their testing depicted the presence of petrol. Mr Cafe and Dr Stern gave evidence that it was well possible the reading obtained by Mr Nystrom and Mr Asmussen indicated the presence of some solvent or thinner rather than petrol. The presence of solvents and thinners was likely as the appellant had recently had the floors repolished and the skirting painted. Mr Asmussen conceded he could not exclude the possibility of varnish without testing for a particular varnish.¹⁹
- [56] It is true that the hypothesis raised by Dr Stern and Mr Cafe was not put to Mr Nystrom. It is unclear why. Perhaps the appellant's counsel considered the accuracy of Mr Nystrom's testimony was sufficiently undermined by his unwise mixing of flooring and skirting in all his samples. It is unfortunate that the defence hypothesis was not put to Mr Nystrom. But the fact remains that his evidence as to finding petrol was contradicted by that of Dr Stern and Mr Cafe.
- [57] All four witnesses were apparently well qualified experts in the chemical analysis of fire debris samples. Apart from the shortcomings referred to in My Nystrom's evidence, none was discredited at trial. In determining whether the guilty verdicts are unreasonable, it is not necessary to make findings as to which of these expert's evidence should be preferred. It is sufficient if the evidence of Mr Cafe and Dr Stern raises a reasonable doubt as to whether Mr Asmussen's testing on sample 8 and Mr Nystrom's testing on his samples showed the presence of petrol rather than the presence of a varnish or paint sharing some of petrol's components. I consider the evidence of Mr Cafe and Dr Stern raises that doubt.
- [58] After reviewing the whole of the evidence, I consider there is a real possibility in this case that an innocent person has been convicted in this case. The readings which Mr Asmussen and Mr Nystrom believed showed the presence of petrol may have shown varnish or paint. The fire may not have started through the ignition of petrol poured onto the lounge room floor. It may have started in some innocent way, perhaps from an electrical fault, a possibility not investigated immediately after the fire by relevant experts. The prosecution expert witnesses initially considered that an electrical fault may have caused the fire. Another less likely but nevertheless real possibility was that the fire occurred at or near the toaster and progressed to the lounge room where combustible lounge furniture caused the most severe damage to the house. The guilty verdicts are unreasonable and not supported by the evidence.
- [59] It follows that the appeal must succeed on this ground. It is unnecessary to consider the remaining grounds of appeal. I would allow the appeal, set aside the guilty verdicts, and instead direct that verdicts of acquittal be entered on each count.

¹⁹ See [31] of these reasons.

- [60] **MUIR JA:** I am grateful for the President's careful recitation and analysis of the facts. I am in general agreement with her reasons and agree with her proposed orders but wish to make a few additional observations. As counsel for the respondent submitted, the jury were entitled to reject the evidence of the experts called by the defence in favour of the experts called by the prosecution. The evidence of the latter was supported by the fact that the fire and its effects appeared to have been more severe in the lounge room than the kitchen.
- [61] However, the prosecution experts were far less firm in their opinions before obtaining the results of scientific testing. That testing according to Mr Nystrom, who did his own testing, and Mr Asmussen, who did the testing relied on by Mr Rowan, showed the presence of petrol in several skirting board samples taken by Mr Nystrom and in one such sample taken by Mr Rowan. The presence of petrol was not detected in any of Mr Rowan's seven other samples.
- [62] The defence experts, Dr Stern and Mr Cafe, were both of the opinion that the tests relied on by the prosecution revealed the existence of a substance which had some of the components of petrol in it, but did not establish that the substance was petrol. Each of them was of the opinion that the components in the tested materials relied on by the prosecution witnesses to identify the presence of petrol were also present in a variety of other materials, such as solvents and thinners which were to be found in common domestic products such as paints and varnishes.
- [63] The part of the defence case now under consideration was not put to Mr Nystrom. It was raised with Mr Asmussen in cross-examination. Asked if a piece of skirting board varnished within three months of testing "could give the same analytical result as petrol", Mr Asmussen said that he had not been able to find a "clear coat finish for floors or timber or anything that contains the solvent that would... not able to be distinguished from... petrol". He also said that he had not been able to find "any current products" (presumably of the nature of varnishes and paints) that "contained gasoline as the solvent".
- [64] Mr Asmussen's evidence did not refute the opinions of the defence experts that the substances relied on by the prosecution to identify petrol in the samples were also to be found in various solvents. The defence experts did not assert that commonly used solvents contained petrol or that petrol could not be distinguished from other solvents by testing. The point made by defence experts was that the subject evidence was not capable of showing that the samples contained petrol and not varnish or solvent.
- [65] The prosecution case was largely circumstantial and a number of other matters contributed to the difficulty of finding guilt beyond reasonable doubt. They included the following. There was no obvious motive for arson. The policy was for the replacement of the dwelling. The appellant had recently finished extensive refurbishments and any gain in consequence of the destruction of the dwelling was likely to be marginal. No container which could have been used in the carriage and distribution of petrol was found. No expert evidence was called concerning the possibility that an electrical fault was the cause of the fire. At least one prosecution expert acknowledged that this could not be ruled out. The fire put at risk, not only the appellant's work tools stored under the house, but his car parked in the driveway. His wallet and keys remained in the house.
- [66] **GOTTERSON JA:** I agree with the orders proposed by McMurdo P and with the reasons given by her Honour.