

CITATION: MacPherson and MacPherson v. Allen, *et al*, 2010 ONSC 3247

COURT FILE NO.: 4447/03

DATE: 20100602

ONTARIO

SUPERIOR COURT OF JUSTICE

BETWEEN:

JOHN MACPHERSON and LISA
MACPHERSON

Plaintiffs

– and –

RITA ALLEN, BARRY ALLEN, S.T.
PHILLIPS ELECTRICAL LTD. and
STUART PHILLIPS

Defendants

)
)
) C. Burgess, for the Plaintiffs
)
)
)

) Z. Volaric, for the Defendants S.T. Phillips
) Electrical Ltd. & Stuart Phillips
)
)

)
)
) **HEARD:** March 31- April 12, 2010

MILLER J.

- [1] On June 25, 2002 there was a fire at the residence located at 2186 Yorkshire Crescent in Burlington. The fire caused damage to the building and to the contents amounting to \$194,728.67. The quantum of damages is not in dispute and it is agreed between the parties that if liability is proven, the Plaintiffs will also be entitled to pre-judgment interest and costs.
- [2] John and Lisa MacPherson had purchased the house December 29, 2001. In 1978, the previous owners had retained the services of a contractor to build an addition to the house who had in turn hired S.T. Phillips Electrical Ltd. to do the electrical work. The addition, on the West side of the house, contained a kitchen and a family room. It is not in dispute that S.T. Phillips Electrical Ltd. is a sole proprietorship, the sole proprietor being Stuart Phillips. The Allens are no longer parties to the action.
- [3] The Plaintiffs claim that the fire was caused by an electrical fault due to Stuart Phillips' negligent stapling of electrical cables thereby damaging the insulation material.

- [4] The Defendant argues that it is just as likely, if not more likely, that the electrical fault which caused the fire resulted from mice chewing on the electrical cables.
- [5] Both the MacPhersons testified, as did Stuart Phillips. All other witnesses were expert witnesses, qualified to give opinion evidence.
- [6] All experts who were so qualified agreed on the area of origin of the fire; in the attic above the Southeast corner of the family room. All agreed that the fire occurred because of an electrical fault in a cable within the area of origin. All agreed the only possible causes of the electrical fault were improper stapling or damage by mice.
- [7] The burden is on the Plaintiff to prove that Mr. Phillips' improper stapling was the more likely cause of the fire. While there was some evidence that a second roof had been added to the addition after Mr. Phillips had completed his work and that vibrations due to the construction of that second roof could contribute to creep caused by improperly driven staples, it was not argued that this would in any way reduce or exempt Mr. Phillips from liability.

The Experts

James Bennett

- [8] James Bennett received a civil engineering degree from Ryerson Polytechnical Institute in 1990. He worked for Bell Canada for seven years in the installation of electrical circuits and fibre optics. In 1997 he became a certified fire investigator and worked until 2005 for Rochon Engineering as a fire protection and forensic engineer during which he investigated over 1000 fires. Since 2005 he has worked for the Office of the Fire Marshall providing technical expertise to fire investigators. Mr. Bennett has both attended and instructed at courses related to fire investigation. He is currently the editor of the Fire Investigators' magazine. James Bennett was qualified to give opinion evidence with respect to fire cause and origin analysis.
- [9] James Bennett conducted the investigation of the scene, documenting it with photographs and ultimately by removing and preserving some physical exhibits from the scene. He prepared a report on behalf of Rochon Engineering.

Vincent Rochon

- [10] Vincent Rochon is an electrical engineer and the owner/operator of Rochon Engineering. In the course of his career he has done hundreds of fire investigations and peer reviews of reports. He has been qualified to give opinion evidence in superior courts 40-50 times. He was qualified to give opinion evidence with respect to electrical engineering and fire cause and origin analysis.
- [11] Because the cause of the fire was found to be electrical, Mr. Rochon was involved in the file as a consultant and also peer-reviewed the report prepared by Mr. Bennett. Mr. Rochon acknowledged that his firm had been retained by the MacPhersons' insurer; which insurers provide him with 10-20% of his business.

Zihnija Hurem

- [12] Dr. Zihnija Hurem has been a physical chemist for over 20 years. He manages PH Quantum Laboratories in Mississauga. He was qualified to give opinion evidence in the area of physical chemistry.
- [13] Dr. Hurem was employed at PH Quantum Laboratories on June 26, 2002 when the lab received a sample of 3-4 mice droppings from Rochon Engineering. Dr. Hurem was asked to check the sample for the presence of PVC and/or copper.

Jacob Kleiman

- [14] Dr. Jacob Kleiman has a Ph.D. in solid state physics and has run Integrity Testing Laboratories for 21 years at which he and 14 employees routinely test materials for their components and properties. He was qualified to give opinion evidence in the area of material sciences and the analysis of materials.
- [15] Dr. Kleiman was retained by DeBarardis Engineers to review the report prepared by Dr. Hurem.

Rick DiScipio

- [16] Rick DiScipio is a civil engineer. He did one year of electrical engineering before switching to civil engineering. He currently acts as a consulting engineer to the insurance industry with respect to buildings, vehicle impact, compliance with building and fire codes and fire investigation. Prior to 2007 he worked for 10 years with DeBerardis Engineering in a similar capacity, and has received training in respect of fire and explosion investigation. He was qualified to give opinion evidence with respect to the determination of cause and origin of fires.
- [17] Mr. DiScipio co-authored a report on behalf of DeBerardis Engineering, commissioned by the Defendants, in December 11, 2006 with respect to the fire at 2186 Yorkshire Crescent. Mr. DiScipio agreed with the area of fire origin as identified by Mr. Bennett. He agreed that the fire was electrical in origin due to a failure of the electrical system but disagreed as to what caused the mechanical damage.

Jean-Francois Joubert

- [18] Jean-Francois Joubert is an electrical engineer. He has run CEP Forensic Engineering since 1979. He has done over 1500 investigations with respect to fire origin and cause and electrical matters. He has testified as an expert approximately 100 times in courts of various levels in Ontario, Quebec and Newfoundland. He was qualified to give opinion evidence with respect to determination of the cause and origin of fires.

- [19] Mr. Joubert was retained by the Defendants December 28, 2008 to give an opinion with respect to the cause and origin of the fire at 2186 Yorkshire Crescent. He reviewed the photographs, documents and previous reports and the discovery transcripts of witnesses. He also had reviewed the available literature on staples and rodents pertaining to the cause of fires.

The Investigation

- [20] Both John and Lisa MacPherson testified about being awoken by a fire in the early morning hours of June 25, 2002. They, their children and pets escaped unharmed. The fire department was called and extinguished the fire which had been burning in the upper Southeast corner of the family room.
- [21] On June 25, 2002 James Bennett was dispatched to 2186 Yorkshire Crescent by his employer Rochon Engineering. He conducted an investigation of the scene that day and again on July 26, 2002. On both occasions Mr. Bennett took photographs which were collectively entered into evidence as Exhibit # 2.
- [22] On June 25, 2002 Mr. Bennett also received a sample of what he believed to be mouse droppings for analysis. He received the sample from Greg Madill, an insurance adjuster who was present at the scene. Mr. Bennett acknowledged that Mr. Madill was “most likely” pointing out things to him as he conducted his examination of the scene.
- [23] On July 26, 2002 Mr. Bennett seized portions of the wood members and remnants of electrical cables located in what he had identified as the area of origin of the fire.
- [24] Mr. Bennett concluded that the fire had originated on the family room side of a wall separating the family room from the master bedroom. His opinion was based upon an examination of the smoke layers and fire consumption and an analysis of the movement and the intensity moving backwards to where the fire originated.
- [25] Mr. Joubert agreed that the fire had originated in the attic of the family room. He noted that the Rochon report had not defined the limits of the area of fire origin, but Mr. Joubert would place it within a two to three foot radius.
- [26] Mr. Bennett’s investigation revealed that a brick wall (the original outside wall of the house) separated the two rooms. Wooden framing covered by drywall formed the interior wall of the family room. In the area where the fire occurred, electrical cabling ran up the wooden studs, between a wooden top plate and the brick wall and then across some ceiling joists.
- [27] Mr. Bennett concluded that the fire was electrical in origin as there was no other energy source present in the area. He found no evidence of devices, splices or modifications to the cables in that area. He did find evidence of arcing between exposed wires. He concluded that something caused overheating.

- [28] Mr. Bennett considered two possible causes of the overheating; damage to the cables caused by rodents and improper installation of the cables. Either way, something had to have impacted on the cables in the area of fire origin.
- [29] Given the presence of what he believed were mouse droppings above the vapour barrier in the ceiling of the family room, Mr. Bennett considered the possibility that mice had damaged the cables, exposing the wires. Mr. Bennett examined all of the electrical cabling in the family room (over 100' of cable), back to the panel box in the basement, and found "not a single indication" of bite or chew marks on the cables.
- [30] Mr. Bennett found neither mice carcasses nor any mice droppings in the area of fire origin.
- [31] Mr. Bennett found no staples in the area of origin.
- [32] Mr. Bennett observed improperly driven staples in other areas where the cable had been installed. He testified that in his observation of all of the cabling it seemed to be fastened by staples at regular and frequent intervals. In the physical exhibits Mr. Bennett removed from the scene there are several staples attaching cables to wood members. Mr. Bennett was able to identify several examples among them where the staple was driven in on an angle and/or overdriven; in both cases exerting pressure on the cable.
- [33] Mr. Bennett was aware that a second roof, above that directly over the addition, was present. He agreed that vibrations due to the construction of that second roof could contribute to creep caused by improperly driven staples.

Stuart Phillips' Testimony

- [34] Portions of Stuart Phillips' examination were read in as part of the Plaintiffs' case. These included his admission that he was a sole proprietor; that only he and his employee Brian Taylor had done the electrical work on the addition to 2186 Yorkshire Crescent; that he alone had done the stapling in the attic and there was no room there to drive a staple in straight. He insisted that the staples were never installed in such a way as to damage the conductor and that the Ontario Hydro inspector would have said something if there was any problem with the stapling. Mr. Phillips maintained that it was a judgment call to staple the conductors in order to separate them and prevent them from bundling.
- [35] Mr. Phillips testified at trial. He is now retired and has been since 2007. He began working as an electrician in 1945. He first obtained his journeyman's licence in 1950, and held that until his retirement.
- [36] In 1978 Mr. Phillips was hired by the contractor, Ayres and Fleming, to do the electrical work on the addition being built at 2186 Yorkshire Crescent. Referring to some timesheets prepared at the time, Mr. Phillips was able to testify that his work there commenced November 20, 1978 and was completed December 14, 1978. He was assisted by Brian Taylor, at that time a fourth year apprentice.

- [37] Mr. Phillips confirmed that an Ontario Hydro inspection was done of his work at the rough-in stage. Mr. Phillips was present when the inspection was done and observed the inspector go up a ladder and look into the attic area where there were wires. Mr. Phillips was not advised there was any problem with his work.
- [38] Mr. Phillips testified that at that time it was acceptable practice to secure two wires under one staple. From 1994 on it was acceptable to have only a single wire secured by a staple. This evidence, while not related to the cause of the fire, showed a change in some of the safety standards since the time the work in question was done.
- [39] Mr. Phillips agreed that the cables running up the wall studs in Exhibit # 3 were not “At least 32 mm from the edge” as required by the Canadian Electrical Code. This evidence, while not related to the cause of the fire, showed that Mr. Phillips’ work was not, in some respects, in compliance with the existing electrical code, but nonetheless passed inspection without comment.
- [40] Mr. Phillips testified that a final inspection would have been done after the work was completed – documentation showing a final inspection was done and a permit issued February 29, 1980 was marked as Exhibit # 20. No defect notice was issued in respect of the project.
- [41] Mr. Phillips testified that he alone performed the electrical work in the attic and specifically that it was he who stapled all the conductors in the attic.
- [42] Mr. Phillips testified that he did install the staples that are present as part of Exhibit # 3. He testified that he did not install any other staples in the attic.
- [43] Mr. Phillips testified that he did not staple any wires to the top plate because that would have necessitated a sharp bend in the wire which have interfered with the insulation and possibly caused fatigue in the wire. He also testified that it was not practical to do so. In examination-in-chief Mr. Phillips testified that he was absolutely certain that he did not use any staples in the attic area other than the ones present in Exhibit # 3.
- [44] Mr. Phillips agreed that the wires running up the right wall stud *could* have been stapled to the top plate without creating a 90 degree angle, but there was no reason to staple them to the top plate. He testified that because those cables would have been further down than the ones atop the ceiling joist and the danger of heat build-up would be less, there was no reason to separate them as they ran across the top plate.
- [45] Mr. Phillips testified that he chose to staple the wires in Exhibit # 3 in order to separate them and to prevent a build-up of heat. He testified that he “felt” that he had stapled them properly although the staples could not be kept straight because he did not have enough room to hammer straight down.
- [46] Mr. Phillips testified that the staples may have touched the wire but were not driven into the wires in a cutting manner. He did not think that the staples would pinch the wire. He testified, looking at photographs 51-54 of Exhibit # 2, that he did not see any indentation

in the casing of the wire. I found this part of Mr. Phillips' testimony troubling as the damage to the cables from the improperly driven staples is obvious both in the photographic and physical exhibits.

- [47] All except one of the cables in Exhibit # 3 were attached to the ceiling joist by staples. In respect of the cable depicted running along the inside of the ceiling joist in photograph # 48 of Exhibit # 2, Mr. Phillips testified that "it's possible" it was the unattached cable running over the ceiling joist in Exhibit # 3 although he was not sure.
- [48] Mr. Phillips did not appear to have any actual recollection of the manner in which the cable was attached to the side of the ceiling joist, but surmised that because both he and Mr. Taylor were right-handed that that cable would have gone over the ceiling joist in order for it to have been supported. He could not explain why it would not have been together with the other eight cables. His "feeling" was that the wire went over the top of the ceiling joist.
- [49] Mr. Phillips testified that the wire running along the side of the ceiling joist could have been stapled quite close on the side of the ceiling joist because there was room to get a hammer in to hit it.
- [50] In my view, this concession was a logical one, based on the remaining portion of the cable and the manner in which, outside the area of fire origin, it was secured to the side of the ceiling joist. This concession was important because the staple Mr. Phillips acknowledged he "could" have placed there was not found in the investigation and quite clearly could have been in the area of fire origin.
- [51] While there is no evidence as to the manner in which that cable was secured to the side of the ceiling joist, an inference could be drawn that it was affixed by a staple improperly driven, impinging on the cable insulation, as were the staples in Exhibit # 3.

The Competing Theories

- [52] In support of the theory that improper stapling by Stuart Phillips caused the fire at 2186 Yorkshire Crescent, the Plaintiffs rely on expert evidence that the fire could have resulted from a misdriven or overdriven staple. They rely on evidence of improper stapling and damage to electrical cables outside the area of fire origin, the absence of PVC found in the sample of mice droppings, the absence of any rodent damage to electrical cables outside the area of fire origin.
- [53] In support of the theory the fire was caused by mice, or that the cause of the fire cannot be determined on a balance of probabilities, the Defendants rely on expert evidence that the fire might have resulted from damage to the electrical cables caused by mice. They rely on evidence of the presence of mice in the home at the time of the fire, the absence of any staple found in the area of fire origin, the testimony of Stuart Phillips that he did not place any staples in the area of fire origin and their position that there were deficiencies in the investigation.

- [54] Mr. Bennett testified that in light of his findings in his opinion mice were not likely the cause of the fire. Mr. Bennett testified that in his opinion the probable cause of the fire was damage to the cables resulting from improperly driven staples due to the presence of improperly driven staples just outside the area of fire origin.
- [55] Mr. Rochon testified that he had considered whether mice were a cause of the fire at 2186 Yorkshire Crescent and concluded that it was extremely unlikely that mice chewing through wires caused the fire. Mr. Rochon's opinion was that the fire was likely caused by an overdriven staple because of the other evidence of poor workmanship, specifically misdriven and overdriven staples outside of the area of fire origin and because there was evidence of arcing.
- [56] Mr. DiScipio agreed that there were two possible scenarios causing mechanical damage to the wires— an overdriven staple or rodents gnawing on the wires - but he could not rule out either scenario and therefore classified the cause of the fire as “undetermined”.
- [57] Mr. Joubert agreed that the fire was electrical in nature as the only ignition source within the area of origin were electrical cables. He agreed that one of the electrical cables failed and ignited the fire but Mr. Joubert's opinion was that the root cause of the fire could not be determined because of what was missing from the fire scene. Whether mice or an improperly driven staple caused damage to the electrical cable, Mr. Joubert testified that once the damage was caused in either fashion the process of degradation would begin and there is no way of determining the time frame involved in creating the situation when a fire would ensue.

Improper Stapling as a Possible Cause of the Fire

- [58] All of the witnesses qualified to give opinion evidence with respect the cause of fire agreed that an improper staple was a possible cause of the fire at 2186 Yorkshire Crescent.
- [59] Mr. Bennett testified that pressure on the cable from an overdriven or misdriven staple can, over time cause the insulation to break down – this is referred to as creep. The sheathing protecting the wires inside the cables can also break down exposing the wires and ultimately causing contact between the wires and the staples. The breakdown can be exacerbated or hastened by the normal expansion and contraction of the conductor as it is being used and as well differential settlement (because the addition and the original part of the house were on different foundations) and vibrations from, for example, passing vehicles.
- [60] If the wires are exposed and come in contact with the staples a high resistance electrical fault can result which, because the current is proportionately low, will not cause the circuit breaker to trip. A high resistance electrical fault can cause arcing. Mr. Bennett found evidence of arcing on the wires within the area of fire origin.
- [61] Mr. Bennett testified that if this occurs in the presence of ignitable fuel loads, a fire may result. Ignitable fuel loads may include the conductor insulation itself, shingles, plastic

vapour barrier and wood. While it is not easy for arcing to ignite wood, if the wood is splintered it may more easily ignite. In this case the conductor insulation was present, as was vapour barrier and shingles from the old roof. There is evidence of wood splintering where staples were improperly installed.

- [62] Mr. Rochon agreed with Mr. Bennett's assessment of the area of fire origin and agreed that the ignition scenario was a misdriven or overdriven staple.
- [63] Mr. Rochon concluded that the probable cause of the fire was a misdriven or overdriven staple that penetrated or partially penetrated a cable.
- [64] Mr. Rochon was able to point out evidence of arcing between the conductors that had been damaged by the fire. He acknowledged that some arcing was definitely the result of the fire and that only one arc would have caused the fire. He agreed that it would be impossible to identify that one arc from any of the others.
- [65] Mr. Rochon testified with reference to CSA Standard C22.2 18-1972 (Exhibit # 14) that the staples are supposed to be installed in a way that allows free movement of the cable underneath the staple to allow for thermic expansion and any incidental movement caused by vibration or other causes.
- [66] Mr. Rochon testified that if overdriven or misdriven, a staple may over time, result in high resistance contact between the conductor and the staple – this restricts current flow and therefore is, unlike a bolted short circuit, unlikely to trigger the circuit breaker.
- [67] Pressure or damage to conductor insulation from a staple can through creep create a change in the composition, and therefore the insulating quality of the insulation. A high resistance electrical fault can occur causing the plastic material to carbonize therefore becoming a semi-conductor itself.
- [68] Mr. Rochon could not put a time frame on how long it would take for a misdriven or overdriven staple to cause creep and result in a fire. He testified there are too many variables to be able to put a time frame on it but he had dealt with other cases in which it had taken years.
- [69] Rick DiScipio was not prepared to take the position that an overdriven staple did NOT cause the fire, he just disagreed with the way in which Rochon evaluated the two theories as to cause.
- [70] He agreed that localized heat can cause damage to the cable insulation and cause it to carbonize across which current can pass – the insulation itself thereby becoming a semi-conductor. He agreed that the possibility exists that the wooden frame had ignited and that fire could occur prior to arcing.
- [71] While he felt that the mechanism of ignition caused by improper stapling is not fully elucidated, he agreed that it should be considered as a cause in this fire.

- [72] Mr. DiScipio agreed that different mechanisms can occur with an overdriven staple – it's all a function of the pressure on the cable. He agreed insulation can be weakened by degradation, deformation and exposure to heat and that resultant charring can convert the insulation itself into a semi-conductor.
- [73] Mr. Joubert thoroughly reviewed the literature referring to fires caused by improper stapling and those caused by rodents. He concluded it was possible that a staple caused the fire but only if a staple was present at the location of the electrical failure. He concluded he had no reason to believe there were staples there.
- [74] Mr. Joubert agreed that the cables could fail due to mechanical damage to the insulation material on a cable.
- [75] Mr. Joubert explained that each cable has an outer covering of PVC exclusively for the protection of the conductors. Within each cable there is one live conductor covered in black insulation, one neutral conductor covered in white insulation and a bonding conductor that is either bare or covered in green insulation. There is trouble if the live conductor connects with either of the others. Removal of the external covering does not in itself create a fault it just removes the protection and creates a greater risk of damage.
- [76] Connection of the live conductor to one of the others or if a staple point is placed between the copper wire of the live conductor and the other conductors a "bolted" short circuit can occur. This is not known for its propensity to cause fire because there should be rapid tripping of the circuit.
- [77] Mr. Joubert testified that indirect contact can occur through damaged insulation and if the live conductor is damaged sufficiently to cause a leakage of current, creep can occur. The small current will thermally damage the insulation over a short or long time. Creating carbon resulting in a high resistance path which could result in arcing, a potent source of ignition if it is sustained. It is difficult for breakers, fuses to detect these because it may be within the ampage range. It is particularly dangerous because it is localized.
- [78] Mr. Joubert agreed that here a cable failed through a similar mechanism and caused the fire.
- [79] I am satisfied that that an improperly driven staple was a possible cause of the fire.

Presence of Improper Stapling

- [80] Mr. Bennett testified that in his opinion the probable cause of the fire was damage to the cables resulting from improperly driven staples due to the presence of improperly driven staples just outside the area of fire origin.
- [81] Mr. Rochon's opinion was that the fire was likely caused by an overdriven staple because of the other evidence of poor workmanship, specifically misdriven and overdriven staples outside of the area of fire origin and because there was evidence of arcing.

- [82] Mr. Rochon had examined the physical exhibits # 3-#7 both when they were initially returned to Rochon Engineering by Mr. Bennett and more recently together with Mr. Phillips' expert. Mr. Rochon was able to point out on the exhibits several overdriven and misdriven staples securing cables to the studs leading to the area of fire origin. He was able to point to areas on the cable where it was apparent that the staples had caused damage to the wire covering.
- [83] Mr. Rochon opined that it was very possible that at least one staple had been placed to secure staples along the top plate.
- [84] With respect to the ceiling joist, Mr. Rochon testified that all seven staples were misdriven and five of those were also overdriven. He was able to point out that the insulation was broken on the cable closest to the East wall, and that other cables had been marked, damaged and injured apparently by the positioning of the staples.
- [85] Mr. DiScipio agreed there was evidence of misdriven and overdriven staples in the area beyond the area of fire origin. He agreed that angled staples appeared to have left an impression on the outer insulation of one cable and to have cut through another. He agreed there was an issue with the staples compressing the cables but pointed out that where there was evidence of overdriven staples there was no manifestation of overheating or other electrical failures.
- [86] Mr. Joubert agreed that he could see damage to the outside covering of the cables in the physical exhibits but could not tell if there was damage to the conductors themselves. He testified that could be determined by using a device to measure the dielectric value of the cables in that location.
- [87] I accept that there were a number of examples of misdriven and overdriven staples in the work done by Stuart Phillips. I accept that some of the improperly driven staples caused obvious damage to the electrical cables. While it is clear that any direct evidence would have been destroyed by the fire itself, I am prepared to infer that if there was a staple or staples within the area of fire origin, it or they were likely to have been similarly improperly installed and in a way that damaged the electrical cable.

Presence of Mice Droppings

- [88] John and Lisa MacPherson testified that they had a problem with mice in the kitchen after the fire. Lisa MacPherson did not recall being aware of mice before the fire. John MacPherson testified that they had a problem with mice but could not recall if it was before the fire. There was no evidence of any other animals in the house either before or after the fire.
- [89] Given the presence of what he believed were mouse droppings above the vapour barrier in the ceiling of the family room, Mr. Bennett considered the possibility that mice had damaged the cables, exposing the wires.

- [90] Mr. Bennett testified that in light of his findings in his opinion mice were not likely the cause of the fire.
- [91] Mr. Bennett relied on his thorough examination of the electrical cabling not damaged or consumed by the fire and his finding that there were no bite or chew marks on the cables.
- [92] Mr. Bennett further relied on a laboratory analysis of the mice droppings collected from the home, and the report indicating that there was no evidence of PVC (the cable material covering the conductors) and only trace amounts of copper (the conductors being copper).
- [93] Mr. Bennett testified that he was aware of no other case in which damage caused by mice to wire cables was considered to be the cause of a fire.
- [94] Mr. Rochon testified that he had considered whether mice were a cause of the fire at 2186 Yorkshire Crescent and concluded that it was extremely unlikely that mice chewing through wires caused the fire.
- [95] Mr. Rochon had advised Mr. Bennett to examine the conductors which had not been destroyed in the fire, for any sign of disturbance by mice. He accepted Mr. Bennett's finding of no evidence that mice had chewed any part of the existing cable. He further considered the absence of mouse carcasses or droppings in the area of origin.
- [96] Mr. Rochon discounted the theory that mice had caused damage to the cables resulting in the fire because of the absence of any evidence of interference by mice to any part of the cabling elsewhere. He agreed that if a mouse had chewed the wire in the area of fire origin that evidence would have been consumed in the fire.
- [97] Mr. Rochon also considered the chemical analysis of the mice droppings and the finding that there was no polymeric material of sufficient size to be identified as PVC, although Mr. Rochon denied involvement in sending the mouse droppings for analysis and testified that in his view the mouse droppings were not an important factor in determining the cause of the fire.
- [98] In Mr. Rochon's own experience with 24 years of fire investigation he had never seen a case in which mice had chewed on electrical cable.
- [99] Mr. Rochon testified that he was not aware of any single published technical paper in which mice had been found to be the cause of a fire. Mr. Rochon was aware of circumstances involving larger rodents.
- [100] Mr. DiScipio referred to an entry in text called Kirk's Fire Investigation which identified mice chewing on wires as a possible cause for fire. This reference was never put to Mr. Rochon or to Mr. Bennett during cross-examination.
- [101] Mr. DiScipio viewed the report on the presence of PVC in the rodent droppings as inconclusive.

- [102] Mr. DiScipio agreed there was no evidence that mice had chewed any of the cables.
- [103] With respect to the likelihood that mice had chewed the cables in the area of fire origin Mr. DiScipio testified that he could only say that he could not conclude that they did not.
- [104] Mr. DiScipio testified that he could not conclude that an overdriven staple was the likely cause of the fire without scientifically eliminating mice as a cause.
- [105] Mr. Joubert agreed there were two possible mechanisms for the fire; one being damage to the electrical cable caused by mice. He drew this inference due to the presence of rodents, inferred through the presence of feces. He accepted that there was no rodent damage outside of the area of fire origin. Mr. Joubert opined that one bite at one location would be sufficient to create the mechanism necessary to start a fire. Later, in cross-examination, Mr. Joubert agreed this statement was an exaggeration.
- [106] It is clear that there were mice in the attic of the family room prior to the fire. I accept that it is possible mice damaged the electrical cable.

No PVC found in the sample of mice droppings

- [107] It was admitted between the parties that the mice dropping sample was delivered to Dr. Hurem by Michael Rochon and no issue as to continuity in that respect is in issue.
- [108] Dr. Hurem first examined the sample under a microscope. He testified that PVC is not digestible by mammals and therefore had any PVC been ingested and then excreted it would be visible under the microscope which was capable of magnifying up to 400 times. Dr. Hurem found no pieces of PVC in the sample he examined. He testified that he found no particulates of any sort in the sample of any greater size than 1 micron. He testified that a mouse would not be capable of reducing PVC to a particle anywhere near that small. Dr. Hurem did not do further testing for PVC.
- [109] Mr. Bennett acknowledged that he had not gathered the sample of mice droppings himself, but had been provided them from Mr. Madill, the insurance adjuster. He did not know precisely where Mr. Madill had gathered the mice droppings. Mr. Bennett testified that he saw the sample of mouse droppings and he estimated there were approximately 20. Mr. Bennett agreed that some of the mouse droppings he had observed under the vapour barrier had a green or blue colouration as depicted in photograph # 69. The cable in question is blue in colour.
- [110] Dr. Hurem agreed that a larger sample is always better for testing as more testing provides a "more secure" result. He testified that he had no information as to where the mouse droppings came from or whether what he received for testing was a representative sample. He testified that he was provided with 3-4 droppings in total, with a total volume of .183 grams. He testified that none of the droppings in the sample he was given were blue in colour. All of the droppings he examined were uniform in colour and size.

- [111] Dr. Hurem testified that he is familiar with x-ray fluorescent spectography but that that technique would not identify PVC – only chlorine, which is a constituent of PVC. Dr. Hurem testified that chlorine is widely present in many substances and that if the XRF technique identified chlorine he would not be able to conclusively determine its source. He was confident that chlorine would likely be present in mice droppings whether or not the mice had been exposed to PVC.
- [112] Dr. Kleiman testified that any analysis should begin with a careful collection of enough of the evidence for analysis; followed by non-destructive evaluation which can include visual, microscopic, electronic microscopy and x-ray analysis. Partially destructive techniques may also be used, for example spectography.
- [113] In respect of the examination conducted by Dr. Hurem, Dr. Kleiman testified that the presence of PVC in the mice droppings could have been identified by testing for the presence of chlorine, although he acknowledged that many other materials contain chlorine. If chlorine was detected, PVC could have been “fingerprinted” through the use of differential scanning calorimetry.
- [114] In Dr. Kleiman’s view, Dr. Hurem’s testing for PVC in the sample was inconclusive, and he would not exclude PVC as being present.
- [115] Dr. Kleiman acknowledged that he had no expertise with respect to the biology of mice and could not say whether PVC is digestible by mammals. He assumed, apparently without any basis other than the fact mice have sharp teeth, that mice could reduce PVC to particles smaller than 0.1-0.7 microns.

The Presence of Copper in the Mice Droppings

- [116] Dr. Hurem tested the sample of mice droppings further by immersing it in hydrochloric acid in order to determine if copper was present and in what quantity. He did identify copper at a concentration of 83 micrograms per gram (or parts per million - p.p.m.). Dr. Hurem was unable to identify the source of the copper as copper is often present in ground water, soil and food and is commonly found in those substances in a concentration up to 40 p.p.m.
- [117] Following the testing for copper, Dr. Hurem further examined the sample microscopically and found no evidence of PVC.
- [118] Dr. Kleiman agreed that the method used by Dr. Hurem to detect and quantify copper in the sample is very good.
- [119] As to the concentration of copper found in the droppings, Dr. Kleiman felt that it was a significant amount. He agreed the source of the copper could be many things. Dr. Kleiman acknowledged that he had no expertise with respect to the biology of mice and simply assumed that because mice defecate frequently there would be little opportunity to accumulate a significant concentration of copper without direct contact. Based on the

report of PH Quantum alone, Dr. Kleiman testified that he could not exclude the possibility that mice in the home had chewed on electrical cable.

- [120] I have considered that Mr. Bennett acknowledged that he had not gathered the sample of mice droppings himself, but had been provided them from Mr. Madill, the insurance adjuster and he did not know precisely where Mr. Madill had gathered the mice droppings. I have also considered that Mr. Bennett himself observed mouse droppings with blue colouration, whereas the sample analyzed by Dr. Hurem contained no blue-coloured droppings.
- [121] Even if I was satisfied that testing showed conclusively that there was no PVC present, the value of that information is diminished by the fact that Mr. Madill did not testify and there is no evidence that the sample collected and given to Dr. Hurem for testing was in any way representative of the mice droppings present at 2186 Yorkshire Crescent, and the absence of direct evidence that the droppings analyzed even came from that location.
- [122] Similar concerns attach to the evidence with respect to copper found in the mice droppings analyzed. The relevance of that evidence is in no way clear in the absence of some evidence with respect to the significance of the concentration found.
- [123] In sum, I find the evidence with respect to the chemical analysis of the mice droppings to have little relevance, and I accord any reliance on those findings by the expert witnesses no weight.

Interference with the Fire Scene

- [124] Mr. Bennett agreed that the scene had been altered between his examinations June 25, 2002 and July 16, 2002. The differences can be observed in the photographs taken of the scene on those two dates. Mr. Bennett maintained that the structure had not been altered except one part of the ceiling joist had been cut away. He was satisfied that the piece that had been cut away was still present. The piece that had been cut away was collected by him and is Exhibit # 5.
- [125] Mr. Rochon agreed it was not ideal practice to collect physical exhibits from the scene when the scene had not been secured for over a month. He testified that practice is sometimes dictated by circumstance. He was satisfied that the scene had been fully documented in the photographs taken by Mr. Bennett.
- [126] Mr. Rochon did not agree that the manner in which the physical exhibits were stored and then transported to court would have altered the evidence.
- [127] Mr. DiScipio had access to the Rochon report of August 9, 2002, including the photographs which comprise Exhibit # 2. He was satisfied with the documentation of the scene that had been done, but he agreed it would be preferable to be able to visit the scene himself. He never requested to see, nor had he examined the physical exhibits.

- [128] Mr. Joubert testified that he had only examined the physical exhibits the day he testified at trial. He maintained that that examination did not change his opinion in any way.
- [129] The interference with the fire scene between Mr. Bennett's two examinations is troubling, and causes some concern with respect to the evidentiary value of the physical exhibits. So too does the length of time and manner in which the physical exhibits were stored. It was clear when the exhibits were prepared for presentation in court that a great deal of detritus from the fire remained on and in the garbage bag coverings.
- [130] I am nonetheless satisfied that the damage to the electrical cables attributable to improperly driven staples was both documented in photographs taken at the time and still apparent, despite their handling, on the physical exhibits.
- [131] More troubling, however, is the fact that part of one ceiling joist had been cut between the two examinations. Although Mr. Bennett was able to preserve the piece that had been cut off and is now Exhibit # 5, this particular ceiling joist was integral to Mr. Phillip's testimony with respect to the possible placement of a staple or staples within the area of fire origin. The Court is left with a less than complete photographic depiction of the ceiling joist as it appeared June 25, 2002.

No staples found in the area of origin

- [132] Mr. Bennett acknowledged that he did not locate any unattached staples in his examination of the scene. He opined that staples that had been in the area of fire origin were unlikely to have melted, but may have been displaced by the work of the firefighters either in extinguishing the fire or in the subsequent overhaul. He also opined that staples may have been lost when the drywall was pulled down. He agreed that a staple could have been dislodged during the overhaul – in which firefighters ensure there are no hidden embers left in the area of the fire by using axes and picks.
- [133] Mr. Bennett opined that the cables depicted in photograph #54 could have been stapled to the top of the top plate or on another ceiling joist in the area of origin. He testified that the conductors on the left could also have been stapled in the area of fire origin. Everywhere else that Mr. Bennett had examined the cabling, the staples were fairly frequent and there were no cables anywhere that were drooping or hanging. He concluded that it was probable that there were staples in the area of fire origin.
- [134] Mr. Bennett agreed that to have stapled the left hand cables onto the top plate would have been bad practice due to the angle it would create in the cable, but that stapling the right hand cables to the top plate would not create the same angle. The single cable to the right

is parallel to the most burned portion of the ceiling joist and was severed by the fire. In Mr. Bennett's opinion it would not have been bad practice to staple the cable to the joist at that location.

- [135] Mr. Bennett testified that he thought it "highly likely" that there was a staple within the area of fire origin which due to creep led to the fire ensuing.
- [136] Mr. Rochon testified that in his experience it is "very rare" that a staple is found. In this case he pointed to the "alligatoring" caused by burning of the top plate and apparent on the ceiling joist Exhibit #5. He pointed out that when mass is lost due to the fire, if a staple is present it will fall out.
- [137] Mr. DiScipio was troubled by an assumption that a staple was present if it could not later be found. He agreed the pressure of fire hoses might dislodge a staple in the area of fire origin but would have expected to have found some evidence of an overdriven staple within the area of fire origin.
- [138] Mr. DiScipio pointed out that while firefighters might engage in overhaul at the scene, they generally do not remove the debris and that further efforts could have been made to locate staples possibly removed during the overhaul. He suggested sifting through the debris and perhaps using a magnet to determine if a staple had been present in the area of fire origin.
- [139] Being able to locate a staple would be helpful, in Mr. DiScipio's opinion, because it would first, establish that there was a staple in the area of fire origin and it could then be tested to see if there is any evidence of metal transfer that would support the theory of an overdriven staple.
- [140] Mr. DiScipio's opinion was that if a staple could not be located, it could not conclusively be determined that an overdriven staple was the cause of the fire.
- [141] Mr. Joubert stated that in order for a misdriven or overdriven staple to be the cause, there would have to have been a staple in the same location. In Mr. Joubert's opinion it was not "mandatory" for there to have been a staple anywhere within the area of fire origin because of the stapling to the studs and ceiling joist outside the area of fire origin. In re-examination, he testified that the rigidity of a cable means that even if it is not supported the cable itself will not bend within a foot.
- [142] Mr. Joubert considered that no staple or remains of a staple was found and that Mr. Phillips says he did not put staples in the area of fire origin.
- [143] Mr. Joubert thoroughly reviewed the literature referring to fires caused by improper stapling and those caused by rodents. He concluded it was possible that a staple caused the fire but only if a staple was present at the location of the electrical failure. He concluded he had no reason to believe there were staples there.

[144] Mr. Joubert testified that if there was evidence of staples in the area of fire origin he would conclude that a staple was a more likely cause of the fire than mice.

[145] I accept that if a staple had been present within the area of fire origin it may very well have been dislodged by the efforts of firefighters to extinguish the fire, both in the use of high pressure hoses and in the subsequent overhaul to ensure no burning embers are left in the wood members.

[146] The fact that Mr. Bennett did not locate a loose staple in the debris is not, in my view, determinative, both because of the deficiencies in the scope and manner of his search, as pointed out by Mr. DiScipio, and because of the manifest interference and “clean-up” of the fire scene between Mr. Bennett’s two examinations of it.

No evidence of transfer of metal from a staple to a copper conductor

[147] Mr. Rochon agreed that if there had been arcing between a staple and copper wire there would be transference of the metal. He testified however that evidence would be destroyed by the resulting fire. He disagreed that it was significant or critical that no testing for transfer of material was done. He testified that if creep had been the cause transfer of metal would not necessarily occur.

[148] Mr. DiScipio agreed that a high resistance electrical fault can ignite a wood member and that a transfer of metal can occur from arcing that is the *result* of the fire.

[149] Mr. Dicipio agreed he could not rule out an overdriven staple as a cause simply because there was no evidence of transfer. He agreed that evidence of transfer could itself be consumed in the fire. He agreed that where there is a high resistance electrical fault a staple might not necessarily be involved except in the breakdown in insulation. Again, the absence of transfer of metal would be inconclusive.

[150] In Mr. Joubert’s opinion this was a clear case of electrical arcing igniting nearby combustible material.

[151] Mr. Joubert testified that finding a staple in the area of origin would provide an opportunity to test for transfer of metal and thereby confirm the involvement of the staple in the ignition process. The absence of a staple is simply inconclusive.

[152] In Mr. Joubert’s opinion it would be very unlikely, if the staple initiated the fault, that it would not be involved in the arc process simply because of proximity.

[153] I accept both that failure to locate a staple in the fire scene is inconclusive and that if a staple had been found, and tested for transference, evidence of a transfer of metal might as well have been the result of the fire as the cause of it.

[154] I place little weight on the absence of evidence of any transfer of metal.

Import of the Ontario Hydro Inspection

- [155] Mr. Bennett testified that he had assumed Ontario Hydro had done an inspection of Mr. Phillips' work and that did not affect his opinion that an improperly driven staple was the probable cause of the fire.
- [156] Mr. DiScipio agreed that in coming to his conclusions he presumed there were no deficiencies in Mr. Phillips's work; in doing so he relied on the certificate of the inspector. He presumed both that the work and the inspection had been done properly.
- [157] It is clear, on the evidence before me, the Ontario Hydro Inspection failed to identify or address some obvious deficiencies in Mr. Phillips' work at 2186 Yorkshire Crescent, including the bundling of wires, but most importantly, the misdriven and overdriven staples which are apparent both in the photographic and physical exhibits.
- [158] The fact that an Ontario Hydro Inspection was done and no defects were noted does not assist in determining whether any staples were present in the area of fire origin or, if there were, whether they were properly installed or installed as were the ones outside the area of fire origin.

No evidence of damage to cables by mice

- [159] I accept, as did all of the expert witnesses, that no damage due to mice or other rodents was evident on any of the surviving electrical cables at 2186 Yorkshire. While I recognize that if there had been any such damage in the area of fire origin, any evidence would have been consumed in the fire. Nonetheless, I give some weight to the fact that although clearly mice were present in the home, there was no evidence they were engaged in chewing on electrical cables or anything else in the house.
- [160] When I consider the evidence as a whole, including the vagueness in some areas of the testimony of Stuart Phillips and the obvious weaknesses in his testimony due to the passage of time, I cannot conclude that Mr. Phillips' denial that he placed a staple anywhere within the area of fire origin is reliable. I place some weight on his concession with respect to the possible placement of a staple on the side of the ceiling joist, and together with the evidence of his improper stapling, causing damage to electrical cables outside the area of fire origin, I am prepared to draw an inference that there was an improperly driven staple within the area of fire origin which caused the fire at 2186 Yorkshire Crescent.
- [161] I am not persuaded that mice damaged the electrical cables, nor that it is equally likely that they did so. I am satisfied on a balance of probabilities that Mr. Phillips' improperly driven staple caused the fire.
- [162] In accordance with the agreement between the parties communicated to me at the outset of the trial, The Defendants are liable for damages to the Plaintiffs in the amount of \$194,728.67 plus pre-judgment interest and costs.
- [163] If the parties wish to make submissions as to costs, they may do so in writing. Written cost submissions are to be exchanged and filed no later than July 15, 2010.

MILLER J.

Released: June 2, 2010

MacPherson and MacPherson v. Allen, *et al*, 2010 ONSC 3247

COURT FILE NO.: 4447/03

DATE: 20100602

ONTARIO

SUPERIOR COURT OF JUSTICE

BETWEEN:

JOHN MACPHERSON and LISA MACPHERSON

Plaintiffs

– and –

RITA ALLEN, BARRY ALLEN, S.T. PHILLIPS
ELECTRICAL LTD. and STUART PHILLIPS

Defendants

REASONS FOR JUDGMENT

MILLER J.

Released: June 2, 2010