
# ARE UK PRODUCT LIABILITY LAWS SUFFICIENT FOR THE INTEGRATION OF AUTONOMOUS VEHICLES?

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Submitted in fulfilment of the requirements of the LLM (Research)

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10/9/18

Word Count: 28,455

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## ACKNOWLEDGMENTS

My thanks go to the Clark Foundation for Legal Education for funding this project. I would also like to thank my supervisor, Stephen Bogle, for his advice and support throughout the year.

## DECLARATION

I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

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# Chapter 1: Introduction

The last few years have shown a dramatic shift from speculating about futuristic technologies to making them a reality. One of the many areas under considerable development is autonomous vehicles (AVs). Google began testing AVs just a few years ago[1] with Tesla, Ford, and Volvo following close behind, and already the vehicles are only a few short steps away from becoming commercially available. Making the technology a reality necessarily means tasking ourselves with ensuring our legal system is up to date. The testing phase in the USA has already seen several tragic accidents due to malfunctioning systems,[2] leading to major discussions on liability and driver responsibility. More recently, testing has begun in the UK and it has become imperative that our legislation reflects the changes in technology. We must ask whether the law in its present form is equipped to handle the nuances which accompany autonomous vehicles.

## 1.1: Background

Because there are many misconceptions about the capabilities of AVs, I will first briefly explain the technology in question before moving to the main questions to be addressed. There have been certain levels of automation in vehicles for decades; cruise control, the earliest form of automation, was introduced into vehicles in the 1950's,[3] so the world is no stranger to autonomous technology. Semi-autonomous technology has evolved in more recent years to include adaptive cruise control, self-parking systems and lane management assistance. However, all of these systems were designed to aid driving and ultimately a human has remained in control of the vehicle. AVs are not an all-or-nothing concept; a report from KPMG in 2015[4] contained the following diagram to demonstrate the different levels of automation encountered in vehicles:

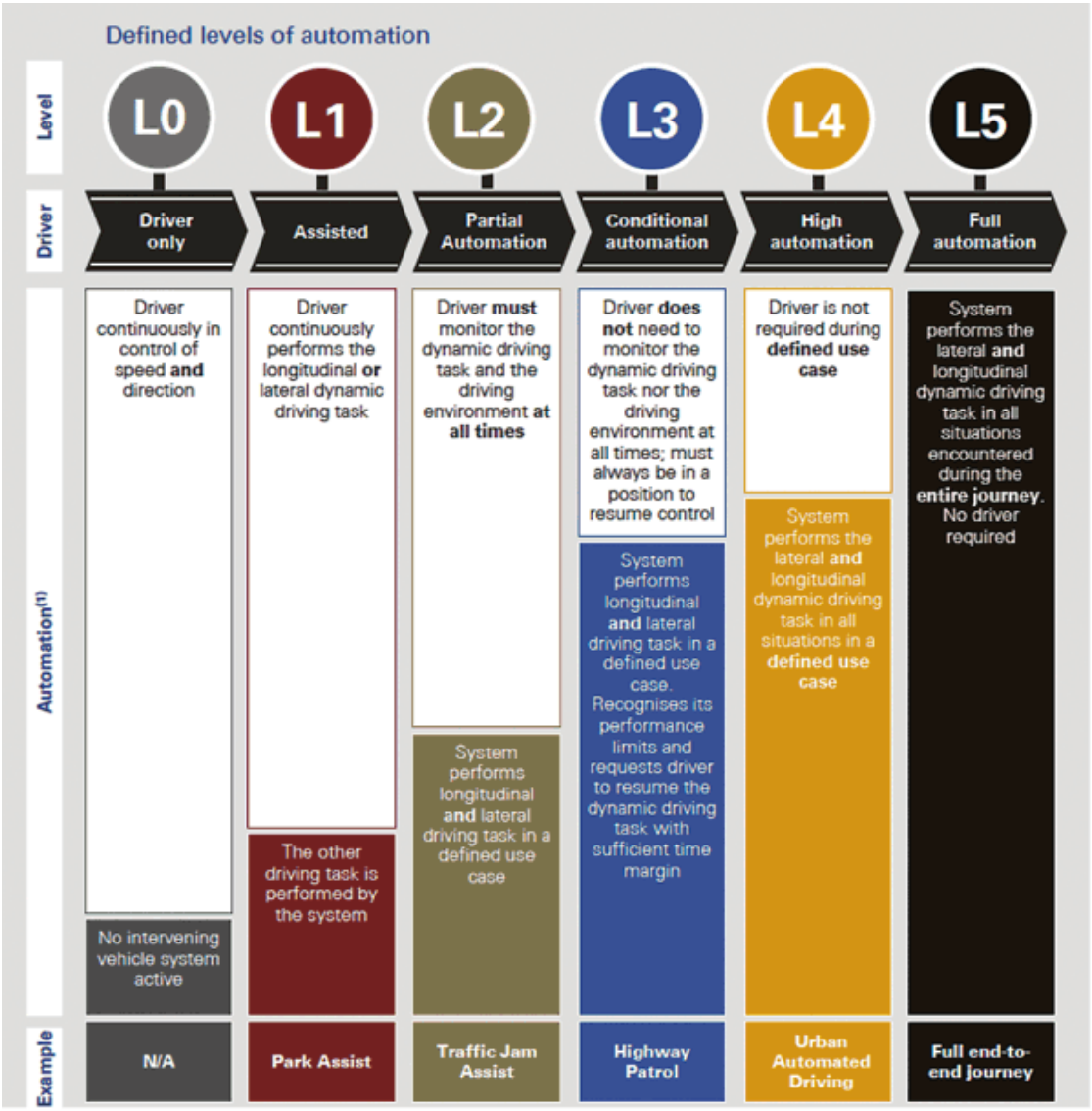
[1] S. Gibbs, 'Google to Begin Testing Purpose-Built Self-Driving Cars on Public Roads', The Guardian, 15 May 2015

[2] Yadron and Tynan, 'Tesla Driver Dies in First Fatal Crash While Using Autopilot Mode', The Guardian, 14 July 2016; Kiss, 'Tesla has No Plans to Disable Autopilot Mode as Third Recent Crash is Revealed', The Guardian, 12 July 2016; Levin and Woolf, 'Tesla Driver Killed While using Autopilot was Watching Harry Potter, Witness Says', The Guardian, 1 July 2016

[3] Ioannou, 'Autonomous Intelligent Cruise Control' 4 November 1993 IEEE Transactions on Vehicular Technology, 42(4) 657 p.657

[4] KPMG, *Connected and Autonomous Vehicles – The UK Economic Opportunity.* March 2015

(Fig. 1.1)

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Automation is a scale, and this diagram indicates that the new AVs are currently operating at an L3 level of automation. While it has been acknowledged that many of the legal issues would be solved by skipping the intermediate levels altogether and not use AVs on the road until they are L5,[6] the reality is that producers of AVs are pushing for vehicles at L3 to be roadworthy and commercially available in the coming years. This means that we must ensure our legal system is equipped to handle the turbulent technology as it progresses towards L5, ensuring

[5] Ibid p.6. (notes from original source.)
[6] Science and Technology Select Committee, *Connected and Autonomous Vehicles: The Future? (Connected and Autonomous Vehicles Report)* 15 March 2017, Chapter 1, para.125

that we plan for the future, but without forgetting the concerns raised specifically by AVs at L3.

Before broaching the question of whether the present law is appropriate, we must first ask: what is the present law? Product liability is currently governed by the Consumer Protection Act 1987 (CPA), substantiated with case law. The CPA was an implementation of the EC directive on liability for defective products,[7] and followed two commissions in the UK, one established by Lord Pearson[8] (the Pearson Commission) and the other a joint report by the Law Commission and the Scottish Law Commission (Law Commission Report).[9] The Law Commission Report noted in particular the push for better product liability regulation as a response to the consequences of the Thalidomide disaster.[10] When considering the adequacy of claims against defective products, the Law Commission Report referenced *Daniels and Daniels v. R. White & Sons Ltd. And Tarbard*[11] as an example of the remedies available at the time. This case involved a man and his wife claiming the manufacturer was negligent in allowing a bottle of lemonade to contain carbolic acid. It was held that the manufacturer only owed a duty to take reasonable care, a duty which was found to have been fulfilled. This case highlights the difficulties in pursuing a case outwith contractual remedies where products have fallen below standard. Where negligence must be shown, it must be proven that there has been a failure to take reasonable care- an onus which is hard to discharge in simple scenarios but becomes increasingly difficult with more complex products. The Law Commission Report noted this hurdle, commenting in particular that the consumer is "at a disadvantage in relation to access to the relevant evidence and scientific expertise, and this may be a real barrier to the initiation of an action on his part."[12] While it was clear at the time that putting the burden of proof on the consumer was challenging, it was also obvious that simply reversing this burden would raise similar evidentiary issues, and would still be a technical and difficult process.[13] The Law Commission Report stated that "the policy of the law should be to discourage

[7] Council Directive 85/374/EEC, 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States concerning liability for defective products
[8] *Royal Commission on Civil Liability and Compensation for Personal Injury*. March 1978
[9] The Law Commission and The Scottish Law Commission. *Liability for Defective Products.* June 1977.
[10] Ibid para.3
[11] [1938] 4 All ER 258
[12] Law Commission Report para.29(e)
[13] Ibid para.34-37

unnecessary litigation"[14] and this idea can be seen through the adoption of strict liability in the CPA.

The CPA seeks to enforce, among other things, strict liability for defective products.[15] Under the legislation, the producer – or where the producer is not identified, the supplier – will be held liable[16] if it is proven that there was a defect under the meaning in s.3 that cannot be absolved by the defences in s.4. The CPA considers a product to have a defect if "the safety of the product is not such as persons generally are entitled to expect,"[17] taking account of certain factors, such as the marketing and reasonable use of the product.[18] S.4 contains defences which, if met, will absolve the party of liability. Defences include complying with regulations, the defect not existing at the relevant time, or – most controversially – "the state of scientific and technical knowledge at the relevant time was not such that a producer of products … might be expected to have discovered the defect."[19] Irrespective of the prior two sections, for an action to be within the remit of the legislation, the appropriate kind of damage must be done. S.5 of the CPA defines damage as "death or personal injury or any loss of or damage to any property,"[20] however this does not include "damage to the product itself"[21] or property not "ordinarily intended for private use."[22]

Until recently, the CPA was the only legislation governing product liability, but it will remain in place to govern AVs. It has become clear that the present rules need to be reconsidered in light of the challenges brought by new technology. The UK Government has begun the consultation and legislation process to adapt the law for AVs, and while steps are being made, the progress is slow and there is still not much guidance. The first major consultation on driverless cars took place from July to September of 2016. The Pathway to Driverless Cars report was published by the Centre for Connected and Autonomous Vehicles (The Pathway Report)[23] and provides a fairly comprehensive discussion of the most pressing

[14] Ibid para.38(f)
[15] CPA s.2
[16] Ibid
[17] Ibid s.3(1)
[18] Ibid s.3(2)
[19] Ibid s.4
[20] Ibid s.5(1)
[21] Ibid s.5(2)
[22] Ibid s.5(3)
[23] Centre for Connected and Autonomous Vehicles; *Pathway to Driverless Cars: Proposals to support advanced driver assistance systems and automated vehicle technologies.* July 2016

hurdles to overcome. While the consultation document covers a vast number of topics, those relevant to the present discussion are the comments on insurance. It noted that "where there is no human input at all, it would be easy to place liability on the manufacturer,"[24] however there will be a time where, as the technology evolves, drivers will still be required to retake control. Because of these complexities, it calls for a re-examination of the insurance system to increase certainty in the event of accidents. In the government's response to this consultation,[25] published in January 2017, it confirms its intention to pursue these changes, suggesting that the insurer would be liable to the driver or innocent third parties with the ability for the insurer to then recover the costs from the manufacturer with the presence of a defect. It suggests including defences where the driver has failed to install software updates or where there have been unauthorised modifications.[26] The Science and Technology Select Committee reported in March 2017 on a similar set of questions, and echoed the sentiments from the previous reports, adding that these concerns would be considered in the Vehicle Technology and Aviation Bill (VTAB).[27]

Because of the dissolution of government in May 2017, the VTAB fell out of parliament and has not been reintroduced. Instead, the Automated and Electric Vehicles Bill (AEVB) was introduced on the 18th of October 2017 and received Royal Assent on the 25th of July in 2018, becoming the Automated and Electric Vehicles Act (AEVA). The AEVA accommodates the insurance proposals from the committee reports, creates specific provision for software updates, and restates the meaning of 'damage' in light of the CPA. While it is reassuring to see active steps towards properly regulating AVs, it remains to be seen whether these proposed changes to legislation will be as effective as initially thought. Indeed, the changes to insurance will be hugely beneficial as it removes the difficulties of litigation from the consumer; however, the act does not address a number of questions that are specific to product liability in general. It is to these questions that I now turn.

[24] The Pathway Report para.2.3
[25] Centre for Connected and Autonomous Vehicles; *Pathway to driverless cars: Proposals to support advanced driver assistance systems and automated vehicle technologies. Government Response*. January 2017 ("The Pathway Report Response")
[26] The Pathway Report Response para.3.13
[27] Connected and Autonomous Vehicles Report Para.56

## 1.2: Thesis overview

This thesis seeks to address four broad concerns raised by AVs. The first is the way in which our perception of fault will affect our approach to AVs. There are two conflicting theories underlying delictual liability: loss and responsibility. These distinct approaches to fault result in a potential conflict of interest, and as AVs challenge our traditional tests of reasonableness as a method for ascribing liability, we need to consider how these theories impact our perception of fault and in turn how this impacts AVs. The added layers of software updates and an unclear expectation of the responsibilities resting on the user of the AV mean that our understanding of the role of fault in assessing liability is also on shaky ground. The second is the meaning of defect. The CPA appears to provide a sturdy definition of 'defect' on the surface, however a closer look at the case law highlights diverging opinions on the relevance and importance of consumer expectations in assessing the safety of a product. These discrepancies will create issues as the expectations surrounding AVs fluctuate with the successes and failures associated with a developing technology. Meeting the definition of "defective" in the CPA may have new complications that will require a reformulation or modified test. The third is the classification of property. The CPA enforces a distinction between private property and commercial property, with the result that each is governed by distinct rules for seeking compensation. However, with the rise of the shared economy this line has become blurred. The introduction of companies such as Uber means that individuals are using their personal vehicles for commercial purposes, and in the future, this may extend to AVs. Whether the distinction between private and commercial is still justifiable in these circumstances must be discussed. The fourth is the scientific defence. This defence is designed to allow manufacturers to escape liability should the requisite requirements of lacking knowledge and discoverability be met, however the few cases discussing these issues suggest that the defence operates more strictly than is usable. Furthermore, given that the defence was not a mandatory element of the EU directive, some have suggested the defence be removed altogether. It is unclear whether these calls have any standing, or moreover what contribution AVs can make to this debate.

These four issues will be addressed as follows: Chapter 2 will unpack the boundaries of fault in attributing liability, with a focus on loss and responsibility in turn; Chapter 3 will address the definition of defect; Chapter 4 will look at the distinction between private and

commercial property; and Chapter 5 will comment on the role of the scientific defence. These chapters focus on substantial issues found in the CPA that will affect our approach to legislating for AVs. They involve questions of the adaptability of the present law. The paper will ground itself in the CPA as its primary source of legislation, with case law, the AEVA, and the government discussions as supplements. These sources will provide the foundation for legislating AVs now in their developmental stages, and in the future, as they are integrated. It must be a priority that our concerns with the law are considered now to ensure the law does not fall behind. While much of the debate will be informed by insurance questions and ethical concerns, the thesis will focus specifically on the appropriateness of the CPA. Questions relating to insurance and ethics will not be discussed here. It may be that many of the concerns raised in this paper are in fact not concerns when examined in more detail, however the questions must be asked before conclusions can be drawn. In conducting this review of the present product liability laws in the UK, it is not my purpose to suggest how to overcome these issues, but simply to highlight where, if at all, the gaps exist, and thereby to contribute to the continuous improvement of the law.

## Chapter 2: Locating the Fault Boundary

At its most basic iteration, one can only be held responsible for one's own action or inaction. While this simple model must be expanded to incorporate various spheres of influence such as property or businesses, it remains, at its core, a simple concept. If I am responsible for A (be it my body, my property, my product) and A causes harm to B, then I am responsible for the harm. This is the foundation of the law of negligence. While the concept is straightforward, its application is far from it. Issues of causation complicate the fault principle as competing parties seek to absolve themselves of liability by proving that the harm was in fact caused by another. This process is not always practical, and the UK has discussed whether negligence is actually the best solution for compensating for harm caused. Indeed, this was one of a number of concerns raised during the Pearson Commission and while negligence was not abandoned, the commission called for the implementation of certain strict liability schemes in an effort to reduce uncertainty.

The debate between negligence and strict liability highlights one of the fundamental issues underlying fault: loss and responsibility. Each represents a distinct approach to compensation. A focus on loss values compensating the damage sustained, no more, no less, whereas a focus on responsibility values ensuring blame is placed appropriately and holding people to account for their actions. Both the debate between loss and responsibility and between negligence and strict liability have relevance to the AV movement. Because AVs are products they fall under the CPA's strict liability scheme, however even strict liability schemes do not abandon the concept of fault altogether. The user of the AV still has responsibility until the vehicles become fully autonomous with no monitoring required. This added layer of potential fault will complicate claims as we balance user responsibility with defective products. The way these claims are handled will be affected by whether we choose to favour compensating loss or enforcing responsibility. In an attempt to answer these questions this chapter will discuss three things. First, it will look briefly at the debate between loss and responsibility as they relate to fault in order to understand these delictual theories and their relevance to AVs. Second, it will highlight some of the difficulties which may arise if we do not have a clear understanding of the relevance of fault, through consideration of the provisions in the AVEA pertaining to software updates. Finally, it will discuss the responsibilities of the operator, with a consideration of how reasonable behaviour will affect questions of fault.

## 2.1: Theories of delictual liability

I begin this chapter with a brief detour into the theoretical foundations for negligence. While I want to remain primarily focussed on an assessment of the current law, no consideration of the appropriateness and effectiveness of a rule would be complete without first asking why it has been implemented in the way that it has. Stapleton captures the necessity of this when she states that theory "must also be able to explain where all the boundaries of the rule lie and why they need to be there."[28] When we ask the question 'are the laws in the UK sufficient to integrate autonomous vehicles?' we are necessarily asking 'where are the current boundaries of the law? If they are not wide enough can we justify expanding them to include this new technology, or can we provide an explanation as to why the boundaries must remain in place?' To answer these questions, we must understand why the law has been structured in the way that it has, and the answers to this lie in theory. It is possible that I will raise more questions than I will answer, since fully exploring the theory is simply not possible here. My goal is to locate the sources of conflict within the theory of delict to highlight why these are relevant to the present law and how they can impact our approach to AVs.

As I have mentioned before, there are two underlying theories in delict: loss and responsibility. Each of these have correlating concepts which contribute to our perception of fault; loss relates to economics, and responsibility relates to personhood. Let us begin with responsibility. Responsibility stems from the idea that freedom is the fundamental necessity of society. Owen explains:

> "the freedom concept rests upon the notion of free will – the capacity of persons rationally to select personal goals and plans for life, and their possession of means to achieve those ends… freedom accords persons dignity, for it permits each human to design and then to follow his own life plan, distinct from any other."[29]

[28] Stapleton. *Product Liability*. (1994, Butterworth) P.96

[29] Owen, 'Philosophical Foundations of Fault in Tort Law' in Owen, Ed. *Philosophical Foundations of Tort Law*. (1995, Clarendon Press) 201 p.203

The concept of dignity through free will derives from Kant's theories of personhood. In his *Groundwork for the Metaphysics of Morals*, Kant explains that "everything has either a price or a dignity."[30] Things which have a price can be replaced with things which are equivalent, however things which are "elevated above all price" have dignity, where dignity is an inner worth and price is a relative worth.[31] He elaborates that "autonomy is thus the ground of the dignity of the human and of every rational nature (emphasis excluded)."[32] This creates a picture where, because humans are rational beings capable of autonomy, we have dignity; and because we have dignity, we must be respected and treated as an end (someone with inner worth), and not treated as a means (someone with relative worth). Kant's theory can be summarised with the simple statement that a rational being must "treat itself and all others *never merely as a means,* but always *at the same time as an end in itself*."[33] Owen explains that for Kant, truth is the ideal that everyone ought to possess, and that intentionally causing harm is a subversion of the truth.[34] Harm is a subversion of the truth because it relies upon converting an autonomous free individual into an object of harm, thus treating them as a means. Accidental harm can also be classified as a subversion of truth because it is a failure to "possess the truth concerning the things that caused the harm."[35] What all of this means is that in harming people we are failing to respect their dignity as rational agents and their right to choose for themselves, because the act of causing harm means using them as means to our own ends. This understanding demonstrates the importance of personal responsibility to a theory of freedom. Kant would hold anyone responsible for not respecting other rational agents as ends in themselves. We can observe this theory play out in our theory of delict because of the importance we place on a mutual respect for each other as autonomous individuals.

A connected theory is the libertarian argument, otherwise known as a theory of absolute liability. Perry explains this theory as one where if I choose to act in this world, then any consequence derived from my actions, good or bad, is mine alone.[36] This is similar to the responsibility we see in Kant, where I am free to choose how to act, but if I choose to use other human beings as a means to my ends, I must suffer the negative consequences from that choice.

[30] Kant. *Groundwork for the Metaphysics of Morals.* Ed. And Trans. Allen W. Wood, (2002, Yale UP) P.52
[31] Ibid
[32] Ibid p.54
[33] Ibid p.51
[34] Owen. 'Philosophical Foundations of Fault' p.204-5
[35] Ibid p.205
[36] Perry. 'Risk, Harm, and Responsibility' in Owen, *Philosophical Foundations of Tort Law.* 321 p.340

While this sounds quite appealing and indeed quite straightforward, Perry suggests this concept has problems. He feels this is too narrow a view of liability because it assumes, similarly to Kant, that harm is always the result of one action upon a passive party.[37] Instead Perry believes that harm is caused by the interaction of two active parties, active in the sense that they are both engaging in some activity.[38] He demonstrates this with a scenario:

> "the injury that results when a motorist 'runs down' a pedestrian should not be regarded as having been caused by one person acting unilaterally upon another, but rather as the upshot of two decisions to act: the motorist's decision to drive when, where and how she did, and the pedestrian's decision to walk when, where and how *he* did."[39]

This criticism shows that harm is not always as simple as seeking to place responsibility on one party. It often involves actions on both sides and from other third parties, all of whom may or may not have contributed to the harm with varying degrees of responsibility.

On the other end of the spectrum however, an irresponsible act may not lead to any damage caused. This is our first inconsistency with the freedom theory. While Kant would want to hold responsible anyone who disrespected another's rational agency to achieve his own end, how this is enforced becomes tricky when one looks at responsibility alone. The boundary between causing harm and not causing harm seems definitive enough, however it does not consider the *risk* of harm. Perry discusses whether this risk of harm is a form of damage in its own right. He opens his discussion with the difference between objective risk and epistemic risk. Objective risk is based on a definitive probability, i.e. the likelihood of a certain event occurring, whereas epistemic risk is causally related, looking at deterministic and indeterministic actions.[40] We can see the relevance of epistemic risk play out when the question of foreseeability is addressed in the negligence test,[41] but how has the law addressed objective risk? Objective risk often finds itself in the centre of medical negligence cases, however this

[37] Ibid p.342
[38] Ibid
[39] Ibid p.342-3
[40] Ibid p.330-3
[41] See *Donoghue v Stevenson* [1932] AC 562 p.580 for a discussion on foreseeability

has normally been in the context of adequately informing patients of risks.[42] Because these cases have framed the issue of risk in terms of patient consent, the failure to alert the patients to the objective risk in each scenario has been actionable under negligence. They have not raised the question of the risk itself being actionable.[43]

Perry introduces the case of *Hotson v East Berkshire Area Health Authority*[44] to discuss the question of whether the risk itself is an actionable harm. In this case the question to the court was whether the increased risk of avascular necrosis created by a delay in treatment was actionable. While initially an award was made, it was reversed on appeal because of a failure to provide sufficient causal connection between the delay in treatment and the damage sustained. It was held that the likelihood of developing the condition was incredibly likely prior to the delay, and that there was little impact made from not treating immediately. The court, unhelpfully, decided this case was not the time to discuss whether a loss of chance could constitute a form of damages because of the difficulties in establishing causation.[45] While it is understandable that it is not the court's responsibility to engage in a hypothetical discussion of the scope of a claim for loss of chance when it does not bear any relevance to the case presented to them, it does not leave us any more enlightened. Perry carries this hypothetical discussion in his article, noting an important distinction between treatable and untreatable cases as it relates to a loss of chance. He notes that if the injury sustained was treatable, it is feasible that in addition to the physical harm created by delaying treatment there was some kind of 'risk damage' caused. However, if the injury was untreatable, it makes no difference whether the treatment was prompt or delayed because it is hard to say that any damage would have been caused at all.[46] This distinction is interesting because it links responsibility to causing harm for determining legal liability. If the injury was untreatable, then the fact that there is a misdiagnosis or any other negligent behaviour is entirely irrelevant because there is no legally

[42] See, for example, *Sidaway v Board of Governors of the Bethlem Royal Hospital and the Maudsley Hospital and others* [1985] 1 AC 871; *Pearce v United Bristol Healthcare NHS Trust* [1999] PIQR P53; *Chester v Afshar* [2004] UKHL 41; *Montgomery v Lanarkshire Health Board (General Medical Council intervening)* [2015] UKSC 11

[43] *Chester v Afshar* is a slight exception to this generalisation, where the question to the court was whether the patient could claim damages for losing the chance to decide when to have the surgery, and the lack of information prevented this choice. However, while there was more discussion about the merits of losing an opportunity to choose, this loss was still tied to the duty to obtain informed consent and so was never raised as an independent action.

[44] *Hotson v East Berkshire Area Health Authority* [1987] AC 750

[45] Ibid p.782-3

[46] Perry, 'Risk, Harm and Responsibility' p.334

perceived harm created by the act. The decision in *Hotson* was upheld in *Gregg v Scott*, where a 25% reduction of the chance of survival due to a misdiagnosis was not seen as a sufficient contribution to the patient's condition, so it could not be established that the doctor's negligence created loss of a chance of survival.[47] Perry's comments on treatable and untreatable conditions can be seen in this case, where the decision turned on whether an accurate treatment would have made a difference to the patient's condition, giving more credibility to the idea that harm must result from the negligence and not simply the possibility of harm.

How does this bear on our theory of freedom and responsibility? It appears to create a lucky escape: if we are to reap the consequences of our actions, but by chance our negative actions do not cause harm, we are not seen to be liable to anyone. This makes Perry's criticism of the libertarian theory even more persuasive because irresponsibility, in the legal sense, requires two parties. Negligence is a concept which is attached to harm. So, while the freedom theory and the concept of responsibility is pivotal in our understanding of delict, it alone does not answer all of our questions. A focus exclusively on responsibility would not create the theory of delict that we presently understand, since a theory focussed on responsibility alone would hold individuals liable for irresponsible acts without necessarily causing harm. *Hotson* is a clear example of attempting to push the boundary of responsibility towards this picture by creating the idea of 'risk damage', where the creation of an opportunity to suffer harm is sufficient to hold an individual to account. However, the fact that this case did not succeed on its claim suggests that our theory of delict has more to it than merely enforcing responsibility.

The other major theory of delict roots itself in economics. Stapleton has written at length on law and economics, with particular regard to product liability. She writes after the introduction of strict liability for products and explains the roots that this legislative decision has in law and economics. This theory focuses less on the morality of who is responsible and why, and instead seeks to enforce responsibility through placing the burden of costs onto the relevant party. When focusing on the costs, it is not important who is at fault, but rather who is best equipped to compensate when harm occurs. One such method Stapleton discusses is price deterrence. This suggests that the risks created by products should be internalised, meaning the price of the product will account for the dangers or harmful effects, should any arise.[48] Under

[47] *Gregg v Scott* [2002] EWCA Civ 1471
[48] Stapleton. *Product Liability.* P.101-2

a strict liability scheme this means that if a product should be found to be defective, the producer can compensate for the harm caused because it has essentially levied the cost of the damages through a small increase in the product's price. This method is a clear demonstration, however, that responsibility has little bearing on a theory of economics. If a product is defective it is because of some fault on behalf of the producer, and yet the method of providing compensation essentially derives from the paying customer. Notwithstanding, this makes sense economically: using a product comes with a certain risk, so it is justifiable to pay a higher price to ensure I can be fairly compensated if said risk materialises.

Another method Stapleton raises is the cheapest cost avoider. This theory suggests that the burden of ensuring a product is safe should rest on whoever can do so most cheaply. In most cases, this will be the producer.[49] But, once again, this cost can be internalised and distributed over the consumers. On the surface these methods seem to give very little weight to the idea of moral responsibility. Yet, economic theories of liability would suggest that moral responsibility is irrelevant in creating a system of legal liability. Perhaps on the philosophical level it is acceptable to speak of 'should' and 'ought', but for creating practical enforceable rules, economics contains the answers. The difficulty with this attitude is understanding all social costs in monetary terms. Meeting the expectations that products are safe to use is a value that is not easily quantifiable. How much is a safe society *worth*? Economists would suggest this will be determined by the market, but on a moral level, safety is invaluable. To suggest that there is a definitive cost that can be placed on the value of someone's life, or their freedom from harm, is akin to forgoing human dignity.

When it comes to quantifying damages, everything boils down to an economic consideration. Owen notes that "a person's worth is measured to a large extent by his productivity which, in turn, is conveniently (if imperfectly) measured by the market."[50] We calculate damages by determining wages lost while in recovery, hinderances to earnings potential, expenses incurred, property damage lost, and a number of other monetary expenses. There is considerable difficulty in quantifying 'hurt feelings', the only non-economic loss successfully sought. How do you quantify a feeling? A purely economic focus does not allow claims to properly account for other types of loss because we do not have a way to

[49] Ibid p.103-4
[50] Owen, 'Philosophical Foundations of Fault' p.211

conceptualise them and adequately compensate them. Yet awards of *solatium* are frequently made, giving weight to the idea that we do value harms which are not always quantifiable in economic terms. Despite the difficulties *solatium* creates for economics, harms without a quantifiable loss in some capacity do not create a legal liability. We can observe this in the reluctance of the courts to give awards for the loss of a chance or an increased risk. Without a tangible damage sustained there is no legal claim.

It is clear that neither the responsibility theory nor the loss theory adequately covers all elements of our theory of delict as we understand it. We do not focus solely on enforcing responsibility, nor do we consider only those harms which can be understood by economics. Hedley stresses the danger of focusing on one theory alone. He states:

> "acceptance of their theories represents a significant narrowing of legal vision, making debate on reforms difficult indeed. To think that any one perspective on law is *uniquely* correct is inevitably narrowing. A rigorous focus on economic costs and benefits encourages lawyers to forget that many costs and benefits are not economic at all. And a focus on law as corrective justice encourages lawyers to forget that there are other sorts of justice."[51]

A theory of responsibility does not reflect our requirement to provide a tangible harm in order to successfully claim damage, and a theory of loss does not adequately account for non-economic considerations. However, elements of both these theories are clearly present in our understanding of delictual liability. Following Hedley's warning is sensible; amalgamating these two distinct theories into one allows for weight to be given to dignity, safety and seeking the individual responsible for the loss, while having a quantifiable method of understanding the value of the harm and allowing the producer to spread the cost of harm over all its products.

This section has provided an overview of the two main avenues of conflict in our theories of delictual liability. They demonstrate distinct approaches to compensation which, as Hedley suggests, are better viewed together. Responsibility and loss are not always at odds with each other; they each provide a unique perspective on the most appropriate way to determine liability and compensate harm. We can see that our negligence rules still

[51] Hedley, 'The Rise and Fall of Private Law Theory' 2018 Law Quarterly Review, 134 April, 214 p.230

predominantly focus on responsibility while our strict liability rules take a more economical approach. AVs, however, will challenge this divide. Road traffic accidents, while covered by insurance, are still handled by a negligence regime. AVs will obviously be an integral part of the road traffic laws but are simultaneously treated as products and will be subjected to the strict liability scheme. There is no fundamental issue with this, however it creates the potential for overlap in some areas and gaps in others. The following sections will look at two such examples. First, the provisions in the AEVA relating to software updates create an area which is governed by insurance law, product liability, and negligence. It will be important to ensure a consistent approach across these three regimes to avoid confusion. Second, there is no clear understanding of what the user's duties presently are, and while it may be assumed that the rules of negligence and the 'reasonable man' would guide our understanding, there is no precedent in the law for operating a self-driving vehicle and we must be careful not to create a void in the law.

### 2.2: Software updates and the AEVA

The only dedicated piece of legislation we have for self-driving cars is the AEVA. Following the proposals from the "Pathway Report,"[52] the AEVA states that insurers will be liable where accidents are caused by AVs.[53] This is an extension of the insurance regime to cover product liability, providing immediate compensation to victims while the insurers pursue recovery for liability separately. This liability is constrained by the AEVA, which provides that the insurance policies may exclude or limit liability if the accident was the result of prohibited software alterations or a failure to install safety-critical software updates.[54] There are two points of concern raised by the AEVA. First, its definition of 'safety-critical' creates a potential problem with our understanding of defect; and second, the fault elements of the insurance policy will mean a potentially lengthy process prior to compensation, reversing the intentions of the insurance regime.

[52] The Pathway Report. Para.1.3
[53] AEVA s.2(1)
[54] Ibid s.4(1)

The AEVA defines a software update as 'safety-critical' if "it would be unsafe to use the vehicle in question without the update being installed."[55] The difficulty with this is that the way in which the definition is worded creates tension with our definition of defect. While we will consider the definition of defect in more depth in Chapter 3, in general, we understand the definition of defect to be where the product does not meet the level of safety that the public is entitled to expect. By framing the 'safety-critical' updates as those which are necessary for the safety of the vehicle, we are associating the vehicles prior to updates with defectiveness. Software updates can parallel product recalls in a sense; the update will correct any prior errors or further refine the technology, and similarly a product recall is an acknowledgment that the product is faulty or incorrect in some way and requires fixing. However, the existence of a recall or an update will not make the prior product defective. The CPA notes that the product must be considered 'at the relevant time,'[56] restricting our ability to compare new products with old products. So, while the definition of 'safety-critical update' sounds like it could hint at elements of defectiveness, we must read new laws in line with prior established law. Updates do present a challenge to our understanding of a product. Are the AVs pre-update and the AVs post-update separate products? There is no definitive answer to that question. Additionally, the ruling in *Boston Scientific*[57] may create further difficulties. It was established in this case that a product could be considered defective by virtue of it belonging to a "defective product group."[58] If we find that AVs pre- and post-update are the same product, then they will be classified as being part of the same product group. The existence of an update means there is now an increased risk on the products which have not been updated, potentially leading to a finding that they are defective. While the definition in the AEVA is not a problem *per se*, it does create an avenue for further questions surrounding defectiveness as it relates to software updates which, for the time being, remain unanswered.

A more pressing issue perhaps is the elements of fault retained in the AEVA as it relates to insurance coverage. Insurers have the ability to limit their liability where the accident was the result of prohibited software alterations or a failure to update the software.[59] There is a clear causation requirement to be established here. The exclusion will only operate if it can be proved

[55] Ibid s.4(6)(b)
[56] CPA s.4(d)
[57] *Boston Scientific Medizintechnik GmbH v AOK Sachsen-Anhalt* C-503/13 *and* C-504/13
[58] Ibid para.41
[59] AEVA s.4

that the accident was a direct result of the alteration or failure to update. This is consistent (albeit slightly stricter) with established Insurance law, where insurers may not rely on non-compliance if it is established that the non-compliance did not increase the risk of the loss.[60] However, proving this will become complicated incredibly quickly because of the technological complexities. Wright discusses that modern-day litigation is increasingly complicated because it is scientifically complex, relying on experiments and statistical analysis.[61] There are many components already involved in proving causation, exacerbated by the involvement of pioneering technology and the uncertainty which surrounds it. It would have to be established that the update would have prevented the accident, and that the software prior to the update was the cause of the accident.

Further to the scientific complexity is the difficulty in finding the line between association and causation. It may be easy to see a failure to update software and a subsequent accident as being related, however there are so many components to the AV technology, it may be quite unlikely that the specific part of the software to be updated was actually the cause of the accident. Goldberg raises the case of *Merrell Dow Pharmaceuticals v Havner,*[62] a Texan case, where it was stated that "there may in fact be no causal relationship even if the relative risk is high."[63] Goldberg uses this case to explain that association does not always mean causation.[64] We must be careful that the two are not conflated. If we are truly judging things based on causation, then it is not enough to say that there is a risk. Indeed, s.11 of the Insurance Act echoes this caution where it prevents the exclusion of liability if it can be proved that the non-compliance did not increase the risk. Applying that same test to the rule in the AEVA, insurers can only limit or exclude liability if the insured fails to prove that not updating the software did not contribute materially to the accident.

One question which comes to mind is why this duty rests on the consumer when the reason the update is necessary is because the product is not up to standard. Here we can see the conflict between responsibility and economics play out. The responsibility theories would tell us the manufacturer has the duty to ensure his products function, which means ensuring the

[60] Insurance Act 2015 s.11
[61] Wright, 'Proving Causation: Probability versus Belief' in Goldberg, ed. *Perspectives on Causation.* (2011, Hart Publishing) 195 p.205-6
[62] *Merrell Dow Pharmaceuticals, Inc v Havner* 953 SW 2d 706 (Tex 1997)
[63] Ibid p.718
[64] Goldberg, 'Using Scientific Evidence to Resolve Causation Problems in Product Liability: UK, US and French Experiences' in Goldberg, *Perspectives on Causation.* 149 p.155

software is up to date, however the economics theory tells us that is impractical because it is the consumer who can most easily ensure the product is up to date by installing any updates himself. This may seem unfair. The consumer is not responsible for the safety of the product, so why should he be responsible if the update is not completed immediately or correctly? And what if it is impractical to undergo the update immediately? It may take time, the owner may be away, the car may be in someone else's possession. If we are to assume the 'cheapest cost avoider' approach here is sound, surely it would not be unjust to require manufacturers to design the cars to automatically update themselves overnight when they are not in use, therefore removing the opportunity to fail to update the software. It would make little difference to the design of the vehicle to impose this requirement and would not unduly burden the manufacturers. Automatic updates are already a commonplace concept in technology, and it would make sense both under the responsibility and economic theories to enforce this with AVs. It ensures the highest level of safety possible with minimal scope for intermittent product failures due to delays in updates and increases the certainty of the legal position by removing one hurdle on the way to compensation.

### 2.3: Reasonable driving behaviour

New technology brings changes and for AVs many aspects of our current road traffic laws must adjust. While AVs remain only partially autonomous with the potential for driver input, clear definitions will be required, and responsibilities clarified. Syed notes that presently there are no statutory definitions of 'driving' or 'driver', nor the term 'in charge'.[65] Before autonomous technology it would have been obvious who was driving the car so having a definition would not have been necessary, however the introduction of two potential sources of control in the vehicle – the software and the human 'user' – may require us to make changes to the Road Traffic Act (RTA) to ensure clarity. Aside from these preliminary questions of definitions, there are other questions of responsibility for the user of the AV. It has not been established what duties, if any, rest upon the user. This question has caused friction in the US, where several accidents have turned into disputes about fault. Tesla stated in 2015 that "the driver is still responsible for, and ultimately in control of, the car."[66] This may not remain the

[65] Syed, 'Regulating Autonomous Vehicles' 2017 Computer and Telecommunications Law Review 23(1) 11 p.12

[66] The Guardian, 'Consumer Reports Urges Tesla to Disable Autopilot After Driver's Death', 14 July 2016

case now and into the future, however no indication has been given that this policy has changed. Indeed, Tesla has stated that the system is supposed to remind drivers to keep their hands on the wheel[67] and that not having their hands on the wheel is contrary to the system's terms of use.[68] Presently, the only guidance in the UK can be found in the RTA, where there are references to a 'competent and careful driver,'[69] and provisions for drivers to maintain 'proper control' of the vehicle.[70] While this is a helpful start, these terms lose their context when the concept of 'driving' no longer exists and the meaning of 'control' changes. To add to the murkiness, many people will not understand how to properly use the vehicle. It may not be obvious how to engage or disengage autopilot, and any manual monitoring that is required may not be completed properly due to a lack of technical knowledge. Users may not understand the limits of the software so will not be alert to potential problems. There have been suggestions that driving tests be altered to ensure that individuals fully understand how to operate the vehicles.[71] This will never resolve all issues, but it is a simple way of ensuring that users are receiving uniform training prior to operating AVs.

A lack of clarity not only raises regulatory questions, it also creates further complications when assessing fault. While the vehicles have the capacity to be in autonomous mode or to be under the user's control, accidents may result in "increased friction between the different parties over who and what caused the collision, resulting in delays in compensation to victims."[72] The government acknowledges the potential difficulties created by this unique period during the development process, and these complications hint towards moving these questions away from a fault-based regime to overcome these issues. Despite this, the government still believes a fault-based approach is the best approach.[73] This claim makes little sense considering the difficulties raised just paragraphs earlier. The extra uncertainty created by the varying levels of autonomy strengthens calls to move AVs away from negligence.

[67] Yadron and Tynan, 'Tesla Driver Dies in First Fatal Crash While Using Autopilot Mode', The Guardian, 1 July 2016
[68] Kiss, 'Tesla has No Plans to Disable Autopilot Mode as Third Recent Crash is Revealed', The Guardian, 12 July 2016
[69] RTA s.2A, 3ZA
[70] Ibid s.41D(a)
[71] Lloyds. 'Autonomous Vehicles. Handing Over Control: Opportunities and Risks for Insurance.' 2014 para 3.5.3
[72] The Pathway Report. Para.2.5
[73] Ibid para.2.20

In the Personal Injuries Bar Association Annual Lecture, Lord Sumption JSC discussed the utilitarian approach to compensation. He stated that "from a purely utilitarian point of view, if the cost of compensating people for personal injury falls on society at large, there is no rational reason to distinguish between personal injury which has been caused by someone's fault, and personal injury which has occurred without fault."[74] Whether we choose to accept a utilitarian approach to compensation or not, it raises an interesting point. The utilitarian model would choose to see no difference between fault-based injuries and injuries without fault. This abandons negligence altogether for the sake of maximising the common good. It is a shocking difference in approach to our current road traffic scheme, but perhaps the claim is not as outlandish as it first appears. Waldron highlights this dilemma with the story of 'Fate, Fortune and Hurt'.[75] The scenario he derives is as follows: Two drivers, Fate and Fortune, are driving down the same road and both see an advertisement in a shop window for discounted shoes. Both look at the shop window while driving, temporarily distracted by the lure of a sale. In Fortune's case, the moment passes without incident and he continues driving. Fate, however, is not so lucky. He fails to notice a motorcyclist, Hurt, in front of him and, distracted, he crashes into Hurt, seriously injuring him. Setting insurance aside, Fate is responsible for the accident and will be required to compensate Hurt for his moment of carelessness. Fortune, with the same moment of carelessness, is not held responsible for anything.

Waldron's story demonstrates quite clearly that negligence is dependent on there being a loss. For that reason, it is hard to focus on responsibility alone. With such strong evidence that negligence does turn on the damage, why do we focus so heavily on responsibility? We have developed several standards of reasonableness for individuals,[76] land owners,[77] doctors,[78] and manufacturers[79] to name a few. And yet the standard of responsibility is just that: it is one of reasonableness. The law does not expect individuals to be perfect and will only hold certain mishaps to account. What the categories listed above demonstrate is a special standard of care for certain groups of people. The law requires a higher standard of care for individuals in these positions because we attach a higher level of responsibility to these groups. But the higher level

[74] Sumption, 'Abolishing Personal Injuries Law: A Project' 2018 Journal of Personal Injury Law 1, 1 p.3
[75] Waldron, 'Moments of Carelessness and Massive Loss' in Owen, *Philosophical Foundations of Tort Law.* 387
[76] "the man in the Clapham omnibus" from *Hall v Brooklands Auto Racing Club.* [1933] 1 KB 205 p.224
[77] Occupier's Liability Act 1957 and the Occupier's Liability (Scotland) Act 1960
[78] *Hunter v Hanley* 1955 SC 200
[79] *Donoghue v Stevenson* and the CPA

of responsibility derives from having proximity with those who would potentially be harmed. Thus, where there is not adequate proximity, there is no duty of care.[80] Even within these groups there is case law to suggest that lapses or moments of carelessness are not sufficient to fail the standard of reasonableness. *McGowan v W & JR Watson* held that a momentary lapse on behalf of the employer did not demonstrate a lack of reasonable care.[81] While we expect drivers to exercise caution while operating a vehicle, we cannot expect perfection; momentary lapses, such as the one both Fate and Fortune displayed, will not automatically create liability.

From this perspective, however, there appears to be inconsistency in the application of these standards of reasonableness. The law may say that moments of carelessness are tolerable, but the law will simultaneously punish Fate for his carelessness and not Fortune. One answer to this apparent inequity is simply that the carelessness creates the potential for harm and by acting carelessly you are exposing yourself to the danger of causing another individual harm. This is not a particularly satisfactory answer. By that logic any activity which could potentially cause danger to oneself or another should be avoided to ensure there is no risk of accumulating liability. As we will explore further in Chapter 3, society cannot be risk free and we must accept the possibility of harm. The only satisfactory answer to why we punish Fate and not Fortune is simply that responsibility is not the priority. Williams and Hepple explain:

> "Liability for negligence is not synonymous with moral blameworthiness. One the one hand, some of those who are at fault escape liability because of the absence of a legal duty; on the other hand, the morally innocent may be condemned to pat enormous sums by way of damages. This is because the standard of care of the 'reasonable man' is today applied indiscriminately to a wide range of human errors – such as momentary lack of attention or an unfortunate reaction to danger. It has been estimated that the average motorist commits one error every two miles he drives, if one of these errors results in damage to another's person or property the motorist is legally negligent. A split-second's thoughtlessness may result in civil liability in both traffic and industrial accidents. Here the theory that liability is based upon fault bears little resemblance to reality."[82]

[80] *Caparo Industries plc v Dickman* [1990] 2 AC 605
[81] *McGowan v W & JR Watson* [2006] CSIH 62 para.14
[82] Williams and Hepple. *Foundations of the Law of Tort*. 2nd ed. (1984, Butterworths) p.114-5

It is clear that although negligence must involve a discussion of responsibility to ensure there is sufficient proximity between the injured and injurer, it is a relatively superficial concept. There is no real sense of fault beyond a (sometimes loose) causal connection and the necessity of damage means that fault is only held to account arbitrarily. From this perspective, perhaps the utilitarian idea of compensation isn't so obscene. This model will become more relevant as AVs become more competent. At this point in the process where there is still the capacity for human fault we may find it difficult to let go of the negligence model we have used for so long. However, as AVs become more independent and require less monitoring, what scope is there for fault? It is the picture of the future that all vehicles will be autonomous and there will be no human input. It is time to consider that the need for a negligence regime on our roads is coming to an end.

### 2.4: Conclusion

Negligence is a multifaceted regime and it has become apparent throughout this chapter that it is not always clear which of the competing interests ought to be most favourable. The two underlying concepts of loss and responsibility create a tension between holding individuals to account for their actions and ensuring that any damage is adequately compensated. It would seem that the current picture of negligence does involve a balance between these two ideas, ensuring that loss is compensated when it can be traced to a responsible individual. There are also questions of responsibility surrounding software updates. The AEVA's definition of 'safety-critical' updates may unintentionally imply that vehicles which have not undergone updates are defective, and we must approach these definitions carefully. Using a law and economics theory it may be most efficient to require AVs to automatically update, removing the potential to avoid updates. This would ensure that the vehicles are always operating as safely as possible while simultaneously preventing an easily avoidable error on the user's part.

Road traffic accidents create a unique predicament because the moments of irresponsibility are often not acts which would fall short of the reasonableness standards that negligence establishes. We see that some moments of carelessness slip by unnoticed, while others can be catastrophic. This uncertainty suggests it may be time to implement a no-fault scheme and abandon negligence in this sphere. With the rise of AVs and the reduction of human

input, this suggestion will become increasingly persuasive. For the moment, the weaknesses of the negligence regime need to be acknowledged. During the coming years of transition between human drivers and AVs, a revised system may be necessary. Fault claims will only become more complicated with the potential for both machine and human sources of error. Neither product liability nor negligence alone will adequately address the issues. While there are no major clashes between these two regimes, we will need to be careful moving forward to guarantee that appropriate standards are being enforced. Caution must be exercised to ensure we are not asking too much of either humans or machines.

## Chapter 3: The Meaning of Defect

Now we have explored the elements of fault which will inform the way we approach negligence and product liability, we can begin exploring the CPA in more depth to understand the current legislative position. The first step to a successful product liability claim is proving the existence of a defect. What is a rather obvious requirement and, on the surface, a relatively straightforward one, has become more obscure as technology has developed. The CPA began with a simple claim that products which did not meet the public's expectation of safety would be regarded as defective[83] and yet, as technology has progressed this phrase has evolved into a complex question. There is no set method for ascertaining the public's expectation, nor is there a guide for what constitutes 'safe'. Further, there have been – and will continue to be – issues with the burden of proof.

Before these questions can be explored, however, we must understand the context. The case law deriving from this short provision in the CPA is murky and at times contradictory. 3.1 will discuss the evolution of the meaning of 'defect' under the CPA and its case law to highlight the main locations of complication, exploring where the natural flexibility created in the CPA test has resulted in a lack of clarity from the courts. I will then move to discuss the main issues found in the defect test. In 3.2, I will analyse the burden of proof. There are discrepancies with what level of proof is required, and further still what issues need to be proven for a successful claim. I will highlight the key cases which are responsible for the inconsistency and what effect this may have moving forwards with AVs. 3.3 will look in depth at assessing expectations. While proving the defect is fundamental, the expectations are the essence of determining what constitutes a defect. I will analyse the case law to find a spectrum of expectations utilised in claims under the CPA. Many of these cases centre their discussions on the idea of risk. An assessment of risk as it relates to an expectation of safety will be provided to illuminate the case law in this area, with the goal of demonstrating the inherent uncertainty contained within a flexible test and a conundrum raised by the natural complexity and uncertainty with emerging technologies. To finish this chapter, 3.4 will consider two final concerns with this test. The first relates to products which do not themselves have a defect but are part of a product series with an increased risk of a defect. The second concerns the decision making necessary by AVs and the resulting ethical dilemma arising from the way in which these decisions will, or should, be

[83] CPA s.3(1)

taken. I will conclude by assessing where the law currently stands with regards to AVs to determine what weaknesses are present in light of their upcoming implementation.

### 3.1: The CPA and subsequent case law

We start in 1987 with the enactment of the CPA, which states that a product is defective if the safety of the product is not what "persons generally are entitled to expect."[84] The legislation offers marginal insight for the meaning of this test, listing marketing and reasonable use as factors to consider when determining expected safety,[85] but beyond these simple guidelines there is nothing. Neither the directive nor the Law Commission Report, published prior to the CPA, provide any explanation beyond the words found in the CPA to aid in our interpretation. Before the CPA or directive were created, the Pearson Commission described the rationale for creating a strict liability test as one which places responsibility on the producers to provide safe goods and on the consumers to use products with care,[86] which, although helpful, does little to guide the courts further in determining what constitutes a satisfactory level of safety. The directive and CPA, however, construed the test in such a way so as to allow flexibility in its application, appreciating the variety of circumstances to which the formula would apply. And indeed, the rise of AVs is certainly a novel circumstance that requires a flexible application. In all the documents currently produced by the Government regarding AVs,[87] none have suggested anything new relating to the meaning of 'defect', so we can safely assume that the CPA is still our first port of call.

What we can surmise from the case law is a particular discomfort with unpacking what 'persons generally are entitled to expect' and some inconsistency in the rulings. The early waves of product liability cases covered many of the issues which we now see as common sense. The infamous case of *B v McDonalds*,[88] heard in 2002, confirmed that obvious risks do not make products defective. The claimants here attempted to persuade the courts that the cups used by McDonalds were defective for failing to contain the hot liquid when knocked over, to

[84] CPA s.3(1)
[85] Ibid s.3(2)
[86] The Pearson Commission. Para.1237
[87] AEVA; The Pathway Report; The Pathway Report Response; Connected and Autonomous Vehicles Report
[88] *B and Others v McDonald's Restaurants Limited* [2002] EWHC 490 (QB)

no avail. It was held that the level of safety a consumer is entitled to expect accommodates for obvious risks which are well known by the public.[89] Just a few years prior, *Richardson v LRC Products* held that consumers are not entitled to expect that products will never fail,[90] and *Abouzaid v Mothercare* established that there would be a defect where there was not sufficient warning about a risk.[91] These three cases mark the beginning of the CPA litigation and provided the first level of clarification so desperately needed.

The next wave of cases, by contrast, open our eyes to the complexity of the expectations test. It begins in 2001 with *A v National Blood Authority*,[92] providing one of the most comprehensive discussions of the CPA to date. The question put to the court in this case was whether blood products containing Hepatitis C could be considered defective under the CPA. There were two significant discussions in this case; the first concerned the meaning of defect, and the second concerned the scientific defence (discussed in Chapter 5 of this thesis). The first part of the judgment discussed whether the public was entitled to expect a risk of unclean blood in general, and further whether there was a known risk that the blood would be infected with Hepatitis C. It was held that no such expectations existed. The public were uninformed of the risk and thus were entitled to expect the blood would be free from infections.[93] Burton J split products into 'standard' and 'non-standard' categories. He suggested that all non-standard products would be considered defective by their nature of being 'non-standard', however, because he was satisfied that the case concerned a non-standard product, he failed to provide any explanation of standard products as they relate to defects aside from their inherently more complex resolution.[94] Burton J interpreted 'all circumstances' in s.3(2) of the CPA to mean only *relevant* circumstances[95] and uses this interpretation to exclude a consideration of avoidability for being outwith the purpose of the directive.[96] Both this interpretation and the discussion of standard/non-standard products have been criticised recently by *Wilkes v DePuy International.*[97] On the matter of avoidability, while not disagreeing with Burton J's approach to the matter, it noted that whether or not a risk was avoidable would factor into the public's

[89] *B v McDonalds* para.60
[90] *Richardson v LRC Products Ltd* [2000] PIQR P164 p.171
[91] *Abouzaid v Mothercare* 2000 WL 1918530 para.27
[92] *A and Others v The National Blood Authority and Others* 2001 WL 239806
[93] Ibid para.55
[94] Ibid para.73
[95] Ibid para.57
[96] Ibid para.63
[97] *Anthony Frederick Wilkes v Depuy International Limited* [2016] EWHC 3096 (QB)

assessment of safety, making it relevant to the test established by the directive.[98] The court was much more overtly critical of the categorisation of standard/non-standard products, calling it "unnecessary and undesirable."[99] It was considered to be too rigid and distracting from the charge to the courts to consider the appropriate level of safety.[100] *A v National Blood Authority* and *Wilkes* discussed the 'acceptability' of risks in the eyes of the public in relation to determining the appropriate level of safety, transforming an apparently objective test in the CPA into one that seems relatively subjective. While discussions of 'acceptable risks' are necessary, a lack of consistent approach to determining what consumers are entitled to expect may create issues.

Another set of queries raised originates again in 2001 with *Foster v Biosil*.[101] Here it was stated that the CPA requires the claimant to prove both the fact of the defect and the cause of the defect.[102] This reasoning was supported later in *Piper v JRI* because to hold otherwise would allow every part of the product to be in contention.[103] However, more recently, a certain line of cases have diverged from this opinion. In *Ide v ATB Sales,* the judge was satisfied with proof of the existence of a potential defect.[104] This does not differ greatly from *Foster*, since there is still a requirement to prove that some defect was present, however the level of proof appeared to be less in *Ide* than in previous cases. The primary departure from this reasoning stems from the CJEU's decision in *Boston Scientific,* when it was established that one defective product in a product group can lead to any product in that group as being classified as defective.[105] This ruling means that there may be times where a risk of defect will be sufficient to fulfil the definition despite the specific product lacking proof that it contains the defect in question. *Boston Scientific* is not alone in this outlook; it is only one in a number of EU cases which have found defects without a precise cause.[106]

This snapshot of the case law reveals two primary issues with the test for defectiveness: 1) the requisite level of proof; and 2) how we adequately assess what consumers are entitled to

[98] Ibid para.89
[99] Ibid para.94
[100] Ibid para.96
[101] *Foster v Biosil* [2001] 59 BMLR 178
[102] ibid p.178
[103] *Terence Piper v JRI (Manufacturing) Limited* [2006] EWCA Civ 1344 para.38
[104] *Ide v ATB Sales Ltd* [2008] EWCA Civ 424
[105] ibid para.41
[106] See in particular, OGH-Urteil: 406 94/04h and D. 2001. IR. 3092 as discussed in Shears; 'The EU Product Liability Directive – twenty years on' 2007 Journal of Business Law 884 p.895

expect and the role of risk in consumer expectations. The following sections will explore each of these issues and their relevance to the AV debate.

### 3.2: The burden of proof

The first issue I will explore is the level of proof necessary in a product liability case. We have already seen that the case law has not been clear as to what amount of proof is sufficient to relieve the burden. As noted above, *Foster v Biosil* suggests that there must be proof of an actual defect, not merely that the product is unsafe. The case law shows two elements which require proof: the existence of the defect and its relation to the damage. Proving the existence of the defect is fundamental to the claim, otherwise the CPA cannot take effect. It was further reasoned in *Piper v JRI* that this is also necessary to avoid the trial becoming "unfocussed and of disproportionate length and expense."[107] Mildred is concerned at the apparent lack of clarity seen in the case law when it comes to the issue of proof of defectiveness.[108] One can sympathise with this perspective as the case law is intended to explain the law rather than add complications. Both *Foster* and *Piper v JRI* adopted a particularly hard-line approach to the matter of proof, and both resulted in claimants being unable to satisfy that burden. Similarly, *Richardson* resulted in a failed claim because the claimant was unable to prove that there was an existing defect over merely a level of unsafety.[109]

On the other hand, cases such as *Tesco v Pollard*[110] and *Palmer v Palmer*[111] seem to be inconsistent with previous decisions on the level of proof. Although in *Tesco* there was no defect found to exist, the tests used by the court to determine whether this was the case appear to be internally inconsistent. Here a bottle cap failed to meet required manufacturing regulations and yet was not found to be defective because the bottle was "more difficult to open than if it had an ordinary screwtop."[112] This is a much more lenient interpretation of 'defect'

[107] *Piper v JRI* para.38
[108] Mildred; 'Pitfalls in Product Liability' 2007 Journal of Personal Injury Law 2 141
[109] *Richardson v LRC Products* p.171
[110] *Tesco Stores Limited & Another v Connor Frederick Pollard (a minor by his litigation friend W Davey)* [2006] EWCA Civ 393
[111] *Palmer v Palmer* [2006] EWHC 1284 (QB)
[112] *Tesco v Pollard* para.18

compared to other cases, however it also imposes an extremely high burden to satisfy since proving the failure to meet safety regulations was not sufficient to find a defect in this case. The judge suggested this was simply because the public would not know about the regulations so could not expect that those regulations would be met.[113] *Palmer* took a different approach and found a defect to have existed where it was possible that the damage may have been partly caused by consumer actions and not exclusively the product itself.[114] There were questions about potentially misleading instructions accompanying the seatbelt in *Palmer* which will have played a role in the outcome. What *Palmer* demonstrates is that there are often factors which contribute to the existence of a defect without necessarily needing to prove with absolute certainty a causal relationship. It shows an appreciation for the complex nature of product liability, an attitude which is lacking in *Foster* and *Piper*.

Accommodating this inherent complexity will become incrementally more important the more pervasive technology becomes. If the courts continue the strict approach seen in *Foster* and *Piper*, it will be almost impossible to bring a successful claim for an AV under the CPA. AVs involve an infusion of traditional automobile technology with several new pieces to provide automation, all of which have their own potential for defects. Requiring strict evidence of the existence of the defect, the cause of that defect, and the link between the defect and the damage may prove too difficult for such an intricate piece of machinery. Indeed, Cohen has raised this difficulty in relation to satisfying the risk-utility test required in America, noting that providing hard evidence may create "an incredibly high burden of proof, make it difficult to find qualified experts with legitimate experience, and simply make it too expensive to pursue claims."[115] Although the UK has not adopted a risk-utility approach to product liability[116] these concerns are just as applicable to the CPA: regardless of the expected level of safety, proof that this level of safety was not met is required, and the more complicated the product, the more difficult this becomes.

Notwithstanding, it appears there may be hope for easing the burden in future product liability claims. A string of more recent cases suggests that the level of proof required is no

[113] Ibid para.17. Further discussed in section 2.3 below
[114] *Palmer v Palmer* para.93
[115] Cohen; 'Self-Driving Technology and Autonomous Vehicles: A Whole New World for Potential Product Liability Discussion.' 2015 Defense Counsel Journal 328 p.333
[116] Burton J rejected the categorisation of defects to require a risk-utility test by the USA. See *A v National Blood Authority* para.39

longer as stringent as before. Two cases, *Ide v ATB Sales* and *Lexus v Russell*, heard together, suggest that proof of the cause of the defect is not required by the CPA. In *Ide*, specific proof of the cause of the defect was not necessary for the judge to find the product defective,[117] and in *Lexus* it was sufficient to establish probable cause for the defect.[118] Neither of these cases required hard evidence of the exact nature of the defect but took a more general approach to the problem. *McGlinchey v General Motors* followed *Ide*'s approach, holding that "a pursuer may not have to prove the precise mechanism of how the defect led to the failure,"[119] again supporting a more lenient approach to proof. This was reinforced in *Hufford v Samsung Electronics*, where it was stated that despite this less burdensome approach, the claimant is still required to prove the existence of a defect, "albeit unspecified."[120] These cases mark a definitive change in the court's attitude to the level of proof required. They do not diminish entirely the need for evidence, but rather reframe it in the appropriate context. There is a clear acknowledgment that these cases involve many parts and often locating the exact defect will be difficult.

Howells has been highly critical of the harshness of previous judgments where the product clearly did not exhibit a sufficient level of safety but did not succeed because the exact location could not be found.[121] He suggests instead valuing the expected level of safety over exact proof in cases where there was not common knowledge or specific warning of a risk.[122] The courts seem to be tending towards this balance, although have not abandoned the need for evidence altogether. What Howells' discussion and the case law represent, however, is a shift in importance, favouring consumer expectations over specific evidence. Permitting general proof of a defect is a clear statement that claimants will not be prevented from succeeding in a claim purely because of the technological complexities involved. We can expect that this reasoning will be upheld in any future cases involving AVs; claimants will not be required to highlight exactly what part of the software malfunctioned or why, but simply that the software failed in some capacity, providing evidence that the AV was defective.

[117] *Ide v ATB Sales Ltd* and *Lexus Financial Services T/A Toyota Financial Services UK Plc v Russell* [2008] EWCA Civ 424 para.15(c)
[118] Ibid para.47
[119] *McGlinchey v General Motors* [2012] CSIH 91 para.39
[120] *Michael Hufford v Samsung Electronics (UK) Limited* [2014] EWHC 2956 (TCC) para.30
[121] Howells; 'Defect in English Law – lessons for the harmonisation of European product liability' in Fairgrieve, ed. *Product Liability in Comparative Perspective.* (2005, Cambridge UP)
[122] Howells; 'Defect in English Law' p.148

Further to this change in direction is the case of *Boston Scientific*. It pushes the boundaries on requiring proof, and it remains unclear to what extent it will be upheld in the UK. The question before the court was whether a product, in this case a pacemaker and an implanted cardioverter defibrillator, could be considered defective because it belongs to a group of products that had an increased risk of failure despite no evidence of a defect in the specific product in question. It considered whether the increased risk with these products resulted in a level of safety which was not satisfactorily high enough. The court held that this was accurate. It stated:

> "where it is found that such products belonging to the same group or forming part of the same production series have a potential defect, it is possible to classify as defective all the products in that group or series, without there being any need to show that the product in question is defective."[123]

It considered that the increased risk was enough such that proof of the individual defect was not necessary to establish that the product did not meet the entitled level of safety. Jervis celebrates *Boston* for strengthening the idea that the precise nature of the defect does not need to be proven.[124] Indeed, its reasoning is especially relevant to AVs where mass-produced vehicles could all potentially be affected by the same defect. An awareness of failure in one vehicle could be sufficient evidence to hold all vehicles in that same product group defective. If the courts choose, however, to reject or limit the scope of *Boston* and focus on the earlier cases of *Foster* and *Piper*, the challenge for proving the existence of a defect in an AV will increase substantially and, arguably, disproportionately.

[123] *Boston Scientific* para.41
[124] Jervis; 'What Defect?' New Law Journal, 8 May 2015, 17

### 3.3: Assessing expectations

I now turn to the question of consumer expectations. The CPA turns on the level of safety of a product and states that in assessing what persons are entitled to expect, all the circumstances will be taken into account,[125] which Burton J in *A v National Blood Authority* has taken to mean *relevant* circumstances.[126] The expected level of safety has been difficult to ascertain because it was intended to be a flexible test. The downside to this flexibility is uncertainty in knowing what factors impact expectations and to what extent. It has been made clear that consumers cannot expect perfection[127] however consistency beyond this is lacking. One of the difficulties the courts have faced is finding the balance between *actual* expectations and *entitled* expectations. *A v National Blood Authority* discussed this challenge, noting that the public may not have any expectations, or that their actual expectations could be higher or lower than what they are entitled to expect.[128]

Just as consumers are not entitled to expect perfection, they are entitled to expect at least a basic level of safety. In *McGlinchey v General Motors,* it was held that consumers can expect handbrakes to perform their function and not suddenly fail without warning.[129] Applied generally, there can be an entitled expectation that products will work according to their specifications. Clearly, the boundary of expectation lies somewhere between minimal performance and perfection. While the majority of cases focusing on expectation provide some clarification in accordance with these guidelines, *Tesco* arrived at a decision that has slightly troubled some academics.[130] It chose to give weight to the idea that "members of the public … are unlikely to have the faintest idea to what safety standard the product they are buying has been designed, if it has been designed to any" [131] and therefore it could not be concluded that the public were entitled to expect the products to meet the specifications in the regulations. This decision sits uncomfortably because it appears to base its decision on what the *actual* expectation of the public is, instead of asking what the expectation *should be.* By not holding

[125] CPA s.3(2)
[126] *A v National Blood Authority* para.57
[127] *Richardson v LRC Products* p.171
[128] *A v National Blood Authority* para.31
[129] *McGlinchey v General Motors* para.37
[130] Fairgrieve and Howells; 'Rethinking Product Liability: A Missing Element in the European Commission's Third Review of the European Product Liability Directive.' 2007 The Modern Law Review 70 (6) 962
[131] *Tesco v Pollard* para.17

that the public is entitled to expect that products will comply with regulations – what seems to be a common-sense position – *Tesco* is acknowledging a degree of specificity in consumer expectations not seen elsewhere. Fairgrieve and Howells note some of the critique of *Tesco* derives from the courts failure to explain its emphasis on the actual expectations.[132] Indeed, an explanation of this fact from the court would provide insight as to why the failure to comply with regulation was not material to the determination of expectations. Instead, we are left to wonder how a similar failure will be treated in the future.

*Tesco* leaves us with two seemingly conflicting understandings of expectations to reconcile. One tells us that we must only look to what persons are *entitled* to expect, and the other tells us we may consider society's *actual* expectations. What is apparent, however, is that the courts have found an assessment of the acceptability of risk to be persuasive in their determination of entitled expectations, suggesting that persons cannot expect a freedom from risks which are accepted by the public. *B v McDonalds* is a perfect example; here it was a known and accepted risk that hot coffee, when spilled, may cause scalding. However, because this risk was accepted by the public there was no entitlement to safety.[133] The courts have viewed risks which are made known as *acceptable*, so with adequate warnings manufacturers will not be liable for product failures associated with these risks.[134] However, there are a significant number of risks which accompany products which are publicly known, and yet will also result in finding a product to be defective. Consider the case of *Boston Scientific*. It was stated that the public cannot expect medical devices to be effective 100% of the time[135] and the patients were warned that there was a risk that their devices could fail without warning. Nevertheless, the claimant's pacemaker was considered defective because of an added risk of failure.[136]

It has been established on several occasions that there is no guarantee that products will, or can, be 100% safe[137] therefore an understanding of acceptable risks is indispensable for a proper assessment of entitled expectations. In *A v National Blood Authority*, Burton J went to great lengths to emphasise the difference between the USA's and the UK's approach to

[132] Fairgrieve and Howells; 'Rethinking Product Liability' p.973
[133] *B v McDonalds* para.60
[134] *Buckley v Henkel* 2013 WL 6537240 para.82
[135] *Boston Scientific* para.26
[136] Ibid para.41
[137] See, for example, *Richardson v LRC Products, A v National Blood Authority, Wilkes v DePuy International*

acceptable levels of safety, stating that the UK would not adopt a risk-utility approach but would instead remain centred on legitimate expectations. While this statement removes the ability to rely on any perceived benefit a product will provide to society to justify the risks, it does not eradicate the need to evaluate the risks themselves. There will always be risks associated with products but there is a universal awareness that certain risks will not be tolerable and will lead to defective products. So where do we draw the line for determining acceptability? Understanding this question is complex and is the subject of many books.[138] The literature suggests two diverging theories about risks in relation to product liability. The first pertains to risks which were accompanied by a warning, and the second to risks which were 'known and accepted'.[139] It is worth unpacking in brief to provide the context in which the risks of AVs must be understood.

It is widely accepted that risks which are warned against do not generally give rise to liability. This was the subject of two significant cases in 2000, *Abouzaid v Mothercare*,[140] and *Worsley v Tambrands.*[141] *Abouzaid* involved a faulty strap on a pushchair. There was no direct warning that using it in particular ways would likely result in a failure, so it was found to be defective for failing to provide such warnings.[142] *Worsley* involved a woman who suffered from Toxic Shock Syndrome (TSS) and claimed that there was not sufficient warning for this risk. The court in this case, however, found that there indeed had been clear warnings. There was an initial warning on the box with more substantial detail contained in a leaflet inside the box, which was considered enough to meet the requirements to warn of a risk.[143] More recently, this approach was upheld in *Buckley v Henkel,*[144] where it was submitted to the court that despite following instructions contained in a hair dye product, use led to an allergic reaction, rendering the product defective. The court did not accept this submission however, because like in previous cases, risk of a potential reaction was covered in the warnings which specifically stated that following the instructions and completing the patch test would not guarantee

[138] See, for example, Adam, Beck, and Van Loon, eds. *The Risk Society and Beyond: Critical Issues for Social Theory.* (2000, Sage Publications); Slovik. *The Perception of Risk.* (2000, Earthscan); Renn. *Risk Governance: Coping with Uncertainty in a Complex World.* (2008, Earthscan)
[139] Phrase borrowed from *A v National Blood Authority* para.55
[140] *Iman Abouzaid v Mothercare (UK) Ltd* 2000 WL 1918530
[141] *Worsley v Tambrands (Ltd)* 2000 PIQR P95
[142] *Abouzaid v Mothercare* para.27
[143] *Worsley v Tambrands* p.104
[144] *Michelle Buckley v Henkel Ltd* 2013 WL 6537240

freedom from any adverse reaction.[145] Likewise, in *A v National Blood Authority* no such warning for potential blood defects existed, favouring the claimant's case.[146] We can surmise from these cases that where a warning is present the manufacturer will not be liable for any injury resulting from the warned risk. This provides an incredibly helpful foundation for warned risks, especially for AVs where the courts have not yet faced a decision directly on the matter.

What these cases do not capture, however, is any potential limit on the manufacturer's ability to avoid liability. It is clear that some risks will result in defects, irrespective of warnings (consider *Boston Scientific*, for example). Here, we turn to risks which are 'known and accepted'. *B v McDonalds* demonstrated that there are certain risks which are deemed so obvious to the public in general that liability will not ensue should the risk manifest. To frame this in the context of the CPA, the public is not entitled to expect freedom from risks which were known and accepted. This naturally leads to asking which risks were in fact known and accepted under the circumstances. This question has been handled somewhat inconsistently. *Buckley v Henkel* accounted for the belief that individuals who used hair dyes would have a greater awareness of the risks involved in the process,[147] whereas *Wilkes* supports an approach which considers the public at large, not merely the targeted users of the product.[148] The favoured approach for AVs may well affect the outcome of cases, as the knowledge of those who use AVs may not be representative of the general public. It will be important for the courts to clarify their approach moving forward to ensure future consistency in the application of this rule.

The focus on risk in the case law has concerned Eisler for one.[149] He believes that risk requires a test of unreasonableness on behalf of the consumer rather than evaluating whether or not the manufacturer has failed his duty to provide a product of satisfactory safety, a direction which he feels "deviates from the ostensible intention of the CPA."[150] While he is justified in questioning how far the courts have pushed the test towards a determination of unreasonableness, the courts have never amalgamated a negligence assessment into a claim

[145] Ibid para.82(e)
[146] *A v National Blood Authority*
[147] *Buckley v Henkel* para.82(b)
[148] *Wilkes v DePuy* para.72
[149] Eisler; 'One Step Forward and Two Steps Back in Product Liability: The Search for Clarity in the Identification of Defects.' 2017 Cambridge Law Journal 76(2) 233
[150] Eisler; 'One Step Forward' p.235

under the CPA. Naturally, a question of unreasonableness must be asked of the consumer in the interests of justice as there may be factors deriving from the consumer's actions which would hinder the causation requirement. However, none of this undermines the strict liability flowing from the CPA, nor does it eliminate the need to consider risk. Fundamental to the test established by the CPA is determining the minimum level of safety the public is entitled to expect, and the perception of risk plays an important role in this determination.

Many studies have investigated the relation between behaviour and perceived risk, and certain trends have evolved.[151] Renn has observed that the perceived control an individual has over the outcome is related to the perception of that risk.[152] He discusses the different perceptions of risk involved in driving compared to flying, noting that individuals often feel that there is a possibility of evading the accident in a car, but no possibility of such escape in a plane.[153] This trend has also been seen with seatbelt usage, where despite overwhelming evidence that seatbelts reduce the chance of injury the majority of the public continue to refuse to use them.[154] Indeed, the same pattern emerges when comparing standard vehicles to AVs. The Financial Times notes a survey from 2016 in which the majority of UK drivers believe driverless cars are unsafe, with the most common concern being that the AV will not be able to avoid an accident.[155] Remarkably, this phenomenon was captured in the article with a quote from Charlie Henderson, a partner at PA Consulting Group, commenting that "driving the car ourselves may not be as safe as having a machine doing it, but at least when we drive we feel safe because we have control over it."[156] Indeed, a study produced by Virginia Tech shows that AVs have marginally lower accident rates than vehicles with human drivers when unreported crashes are factored.[157]

These discrepancies in the perception of risk leave the courts with a dilemma: how do we properly account for the risks involved in using certain products with a test which relies on

[151] See Renn. *Risk Governance: Coping with Uncertainty in a Complex World.* (2008, Earthscan); Slovic; *The Perception of Risk.* (2000, Earthscan)
[152] Renn; *Risk Governance* p.94
[153] Ibid
[154] Slovic et. Al. 'Accident Probabilities and Seatbelt Usage: A psychological perspective' in Slovic. *The Perception of Risk.* 73 It is noted that this statistic may have changed since publication of the article.
[155] Campbell. 'Majority of UK Motorists Think Driverless Cars are Unsafe.' Financial Times, 20 April 2016.
[156] Ibid
[157] Virginia Tech Transportation Institute. 'Automated Vehicle Crash Rate Comparison Using Naturalistic Data' (8 January 2016)

the public's expectations where those expectations may be entirely askew from reality? On one hand, the actual perception of risk is of little relevance given the formulation of the test; on the other hand, we are only entitled to an expectation which can be justified, and that justification will be found in an assessment of the risk as it pertains to the activity. Thus, we find a general expectation by evaluating the legitimacy of the actual expectations. Howells, writing on nanotechnology, devises categories of risk to help understand which risks ought to result in a defect and which risks can be deemed 'known and accepted'. He highlights three categories:[158]

- Totally unexpected risks (TUR)
- Potential but still unexpected risks (PUR)
- Suspected identified defects (SID)

TUR are things which were not anticipated, and although unlikely, are still a possibility with emerging technologies, such as AVs. Howells suggests that under a consumer expectations test, TUR will always render a product defective.[159] There is, of course, a question of discoverability (see chapter 5 for a further discussion on discoverability, however note that this element is not relevant to determining the entitled level of safety). PUR is trickier to classify. These are things which are acknowledged as potential hazards but are not yet seriously considered or known. Again, there is a question of discoverability, more so for PUR than for TUR, however it is still of no relevance to the consumer expectations test in question here. PUR will turn on whether the public was adequately informed of the risk so as to be deemed to have accepted it.[160] The last category, SID, are risks which are supported by evidence and therefore identifiable as potential defects, however it is less likely that manufacturers can escape liability due to their state of knowledge. If the risks are widely known, it is also less likely that they will be considered defects because of the public's potential acceptance of such risks.

As we move from TUR to SID, the acceptability of such risks will increase. We cannot accept risks which are completely unknown or unpredictable, therefore we cannot consider it part of a standard product for those risks to materialise. Yet with risks which are known and supported by evidence, we find it hard to justify that they will lead to a defect because the public is warned and often informed about avoiding the risk. These categories help visualise

[158] Howells. 'Product Liability for Nanotechnology.' 2009 Journal of Consumer Policy 32 381 p.384
[159] Ibid p.385
[160] Ibid p.386

the importance of acceptability in justifying a certain level of safety. This will be pivotal in future cases involving AVs, since the tests – and resulting failures – of the vehicles have been made more public than many other product testings. The courts will need to be wary of the potential mismatching perception of risk relating to AVs in their assessment of legitimate expectations, especially since the majority of the risks (that we currently know of) are known to the public.

Despite the progress the courts have made in clarifying the operation of the test in the CPA, some academics are wary of using the courts at all to determine product liability cases. Fischhoff, Slovic and Lichtenstein feel that the legal system is not designed to make technical considerations in product liability cases. They are wary of expert witnesses being tugged one way or another rather than neutrally presenting the information and are concerned by the complexity of the considerations the courts are required to make.[161] Stapleton, while not critiquing the legal system, shares the concern that product liability is complex and the test inadequate. She believes that 'expectations' are not sufficient to determine whether or not there is a defect because it does not account for the complexity of products. 'Expectations', in her view, focus on what is obvious (e.g. *Donoghue v Stevenson* and the snail in the ginger beer[162]).[163] Indeed, these concerns can be felt with regard to AVs. These products are incredibly complex, and the public's expectations cannot hope to appreciate the intricacy of the manufacturing process. The expectations for these vehicles will be over-simplified and possibly unaware of the technical limitations. Additionally, those best placed to understand where the product has failed and why are not the courts, but the producers themselves. Sifting through the technical arguments supplied to the court by the producers and comparing these to the general expectations held by the public is a formidable task, and one which may be better suited to a committee of experts or tribunal as opposed to the general court. It is worth considering the effectiveness of the current methods of pursuing claims as we move closer to AVs. Litigation for these accidents will be long and technical, and it is possible that the interests of swift justice call for establishing an alternative method of deciding claims.

[161] Fischhoff et. Al. 'Weighing the Risks: Which Risks are Acceptable?' in Slovic. *The Perception of Risk.*121 P.133-4
[162] *Donoghue v Stevenson* [1932] AC 562
[163] Stapleton. *Product Liability.* p.235

Regardless of our opinion about alternative methods to address these claims, it is clear that assessing the public's expectations is a complicated element of the test for defectiveness. The public may not fully understand the product in question, and thus will have an expectation of safety which is either too generous or not strict enough. The perception of risk will affect this expectation, and will result in discrepancies when evaluating public expectations. This is evident with emerging technologies, particularly AVs where the general public has no understanding yet of how the cars are supposed to function, or indeed what they are capable of. The gap between those who celebrate and those who are cautious of the technology is large and it will be difficult to conclude a general expectation of safety from such a wide variety of perspectives. The courts need to acknowledge these factors to make an informed decision based on these expectations and its significance must not be undermined to ensure that an accurate picture of the expected level of safety is provided.

### 3.4: Two conundrums

Once the issue of determining the expected level of safety has been overcome, we are still faced with the unique issues presented by the complexity of AVs. There are two further questions to address in relation to our understanding of 'defect'. First, there are general concerns arising from *Boston Scientific* as it relates to products which do not have a defect *per se*, but merely an increased risk of a defect. It is possible this same concern will be felt in relation to AVs. We must explore the reasoning in *Boston Scientific* to understand the impact it will have on any future cases brought against a producer of an AV. Second, given the goal for AVs to substitute for driver responsibility and decision making, it is inevitable that AVs will face ethical dilemmas. Although it is not the goal of this thesis to explore the nature of moral issues or the best method by which to resolve them, I wish to raise the question in the context of AVs to show that this hurdle is much more pressing than some of the individuals leading the AV debate believe.

As noted previously, *Boston Scientific* found a defect to exist where there was an increased risk of a product failure. This direction is more liberal than some of the prior cases heard in the UK, and it is hoped by many to be the direction in which product liability will now move. Fairgrieve and Pilgerstorfer describe this test as "simply the tendency or propensity of

the product to result in identified harm."[164] Nevertheless, there are some who feel that *Boston Scientific* goes too far. Bergkamp feels that moving from 'defect' to 'potential defect' is too far outwith the scope of the CPA and goes beyond what was originally intended.[165] This appears to be a misunderstanding of the original test in the CPA, which does not make a distinction between a 'defect' and a 'potential defect' as Bergkamp has. The words in the CPA state that "there is a defect in a product … if the safety of the product is not such as persons generally are entitled to expect."[166] It is perfectly feasible to include an increased risk in this definition if the increased risk amounts to a level of safety lower than what is expected by the public. We must be cautious to differentiate between standard risks which are 'known and accepted' and those which are an added risk beyond an expected level of safety. This distinction will be pivotal moving forward with AVs. There will never be complete freedom from accidents, so it will be necessary to acknowledge in advance what the general level of safety to be expected from these vehicles will be so that we can adequately determine what the threshold for 'added risk' is.

The final question to ask in this section relates to the ethical issues AVs will face. Drivers are sometimes presented with tough choices leading to accidents, but often do not have the reaction times or all the information to make an informed decision about what course of action to follow. For example, if a car is accelerating towards the driver in question, does he stay the course and collide head on with the car or swerve into the oncoming traffic? Typically, gut reactions will prioritise our own safety and the response is usually to swerve in an attempt to avoid the accident, but this will often result in far more injuries and considerable damage to other vehicles in addition to the two vehicles involved in the collision. This scenario is known in philosophy as the 'trolley problem'. While widely discussed, Jeffcott and Inglis raise it in the context of driverless cars so it is to their work that I will refer.[167] The trolley problem is as follows:

[164] Fairgrieve and Pilgerstorfer; 'European Product Liability after Boston Scientific: An Assessment of the Court's Judgment on Defect, Damage and Causation' 2017 European Business Law Review 28(6) 879 p.885

[165] Bergkamp; 'Is There a Defect in the European Court's Defect Test? Musings about Acceptable Risk' 2015 European Journal of Risk Regulation 6 309 p.311

[166] CPA s.3(1)

[167] Jeffcott and Inglis; 'Driverless Cars: Ethical and Legal Dilemmas' 2017 Journal of Personal Injury Law 1 19 p.22

> A train is travelling along a track and up ahead are five individuals stuck on the tracks. There is the ability to divert the train thus saving the five individuals, however this alternative route contains one individual stuck on the track. Do you allow the train to continue on its course and kill five people, or do you divert the train to save those five people, killing one individual in the process?

The problem will not always be that obvious in the context of driverless vehicles, however. There are many other circumstances to consider and the balance between the choices will manifest in different ways. It could be to engage in a head on collision to potentially save ten lives, veer into an elderly person to save a mother and her child, or to run off the road and kill the passenger to avoid the collision altogether. These are hard choices to comprehend, and yet a choice will need to be made. An AV will have the ability to process all the surrounding circumstances to know exactly what its options are, a feat not necessarily possessed by humans in the same scenario. However, there is no easy solution or one method to capture all the potential scenarios an AV might face.

I raise the issue of the trolley problem not to discuss its validity, nor to suggest a course of action which I deem most appropriate. I raise the issue to highlight an additional dilemma posed when these choices have the potential to become automated. There is a concern that if an AV makes such a choice it will not be clear whether this is purely an ethical conundrum or a potential defect. While presently this point may be moot due to the fact that we do not have the ability to program vehicles in this way, it is an issue to consider before investigations are made into making this possible. Certainly, if it becomes technologically possible to allow AVs the ability to make this choice by weighing the circumstances, there is immediately a lack of certainty in outcome. The number of variables present in these problems will mean the decision may never be made the same way twice, and arguably, results in a product which does not meet the 'expected level of safety'. Furthermore, there is no guarantee that each model of AV will be programmed the same because there is no uniformity in production or research. Jeffcott and Inglis discuss the variations in approach to the problem, noting that presently the lack of guidance from the Government on this issue means that manufacturers are free to resolve the dilemma however they deem best.[168] This liberty will inevitably lead to a 'race to the bottom'

[168] Ibid p.23

for ethical decision-making as manufacturers seek out whatever programming is most 'consumable' by the market. It would surely be most beneficial to society to decide on a consistent approach to the ethical elements of AVs to avoid any potential conflicts of interest or a 'race to the bottom'.

### 3.5: Conclusion

While the CPA was enacted to include flexibility to allow for an accurate consideration of the context of defects, many things remain uncertain 30 years on. This chapter has sought to analyse some points of concern raised by the test for defectiveness in the CPA in order to present an accurate picture of what areas require improvement moving forwards with the implementation of AVs. The level of proof required presently is unsettled and while there are hopes that the courts have moved towards a more forgiving test which focuses less on proving the existence of the causal link between defect and damage and providing hard evidence of an actual defect, lingering cases leave us wondering what direction future cases will go in.

Even if we are able to meet the burden of proof and demonstrate that an AV has a defect, how do we determine whether it was accepted by society? There are inconsistencies in approaching the determination of the expected level of safety and it is unclear, especially with regards to AVs, what knowledge the public is deemed to have and what the public has been sufficiently informed about to satisfy this test. Further to this question is the uncertain role of risk in determining the level of safety. Given that perceptions of risk are not always accurate, clarity is required for understanding whether this is relevant to determining the level of safety and how the courts ought to approach such an issue, particularly where there will be misconceptions about AV ability and behaviour.

Next, we face the issue of whether we can determine an AV to be defective if another AV by the same producer is determined to be defective. Following *Boston Scientific*, it appears that this will be the case, however this view has not yet been tested by the UK courts and so will remain an area of uncertainty until such clarification is provided. Finally, we are confronted with the question of how AVs will make ethical decisions, and whether these decisions are easily differentiable from defects in the programming. Enforcing a uniform

approach to the ethical questions may help reduce uncertainty in some cases, but the number of variables faced by AVs in making these determinations will always result in a variety of outcomes which some members of the public may feel leads to a level of safety which is below what is expected, thus rendering the vehicles defective. Much of the CPA and subsequent case law is applicable to AVs, and for the majority of cases they will adequately cover any potential problems to arise. Despite this, there are weak points in the law – an indeterminate burden of proof, the role of risk in assessing expectations, how to handle 'potential defects', and ethical concerns related to AV decision making – which, if addressed, will provide much needed comfort to manufacturers and consumers alike as their rights under the law will become more concrete.

## Chapter 4: The Property Classifications

Although some work may be needed to alter the definition of defect, until any changes are made claims may still be necessary under the law as it presently stands. This chapter seeks to examine how the law currently handles claims for damage. The scenario is quite simple: an AV, through a software or manufacturing defect, is caused to crash. From this general picture there are several more specific scenarios which each require contemplation: First, I am the owner of the AV, and my accident causes no harm or external damage, but I have damaged by vehicle; second, I am still the owner of the AV, however my accident has damaged my private property; third, I am not the owner of the AV, but my personal property has been damaged by the accident; and fourth, I am not the owner of the AV, but my business property has been damaged by the accident. Note that I have excluded physical harm from the above scenarios. While I will mention the provisions which presently address physical harm in passing, it has been excluded intentionally due to the relative ease with which claims can be made and addressed under this branch of damage. The focus will remain on damage to property. These scenarios each represent a different category of claim and will be used to illustrate the potentially contentious, or at a minimum, unclear, issues in the CPA and the AEVA.

The AV technological revolution raises another two general questions in product liability in addition to the above scenarios that I seek to address. The first is the scope of proximity. Given that the product in question is now a vehicle operating freely on the roads, the number of potential parties to suffer loss from a defective product greatly increases, and a comment must be made on that fact. The second is the understanding of 'private use' in the CPA. The CPA excludes liability for damage to property that is not intended ordinarily for private use or consumption.[169] A better understanding of the meaning of this phrase is required in the context of road vehicles.

This chapter will begin with these general questions. It first seeks to understand the rationale for the inclusion and exclusion of certain types of damage under the CPA and will then assess the AEVA to determine whether these exclusions are still expedient. It will then consider the general concerns in claiming for damage to property raised by the introduction of AVs – the scope of proximity and the meaning of private use – and it will discuss whether the

[169] CPA s.5(3)

present law and proposed legislation provide satisfactory answers to these queries. Finally, it will return to the four scenarios from the beginning to determine whether the law provides adequate routes to claiming damages, and where the gaps may lie.

### 4.1: Two property categories

Before assessing the division in the current law, it is important to understand the rationale for having a distinction between commercial and private property. Whereas prior to the CPA all product liability claims were treated under negligence and therefore subsumed into one category, the CPA specifically excludes property not "ordinarily intended for private use."[170] This scope of damage necessarily excludes any form of commercial property from giving rise to liability under the act. The Law Commission Report expressed the economic justification for this exclusion in their report, noting that "commercial premises and property is usually covered by the owner's taking out first party insurance."[171] In their view, a business is in a better position to know what property ought to be insured against possible damage and take steps to mitigate that damage in advance, but it is significantly less likely an ordinary consumer would do the same, and even less likely that personal injury would be insured against. They were also of the view that a business can distribute the cost of insurance amongst consumers through the price of its products, but because consumers cannot do the same this would constitute an unreasonable burden.[172]

This distinction for a long time has made sense, however the way in which certain commercial enterprises operate now brings a challenge to this division. Uber and Lyft are prime examples of enterprises which may face difficulties with the classification. These businesses operate similarly to traditional taxi companies, however the vehicles are personally owned by the driver. Under the banner of negligence this makes little difference since it is the driver who is responsible for the passenger's safety. If this commercial model is maintained through the incorporation of AVs, any accidents will then be subject to product liability, and it is here that our concerns begin. If the vehicles are still personally owned by individuals, and therefore private property, and yet are on occasion used under a taxi scheme for profit, are the vehicles

[170] CPA s.5(3)
[171] Law Commission Report, para.120
[172] Ibid, para.121

still private property, or are they reclassified because of their commercial purposes? It may not be just to maintain this difference, at least by the economic rationale in the Law Commission Report. It has quickly become clear that the present rules need to be reconsidered in light of the challenges brought by new technology. The AEVA states that where an accident is caused by an insured AV, and "an insured person or any other person" suffers damage, the insurer will be held liable.[173] It defines damage as "death or personal injury" or any property damage other than to the AV itself.[174] While this is much the same as the description found in the CPA, the phrase 'property damage' in the AEVA only excludes the vehicle itself, goods carried for purchase, or property under control of the driver.[175] There is no specific exclusion for property not intended for private use. This may be taken to include commercial property, however the Act will not be replacing the current rules for product liability and so must be coherent with the CPA.[176] This creates a discrepancy between the two pieces of legislation, and it remains unclear whether the Act intended to include or exclude commercial property. If there is doubt the AEVA will be taken to uphold the distinction in the CPA due to a lack of clarity, however it does create the potential to forge a new avenue should the differences become problematic. Because this discussion is fairly hypothetical, I will not tread too far into the justifications for the distinction, nor will I comment further on whether this distinction is outdated. Until we understand more about how AVs will be treated in this context and have a firmer grasp on the reality in front of us it is difficult to provide an accurate and complete discussion. It is enough for now to understand why the distinction was enforced and what may create issues as AVs progress. With this in mind we will move on to slightly more tangible concerns.

### 4.2: General concerns

Due to the limits of human foresight there are bound to be parts of the legal system that are challenged by the changes brought by technology. Neither the CPA nor the general rules of delict accounted for the development of AI, so naturally there are points which need to be reconsidered. There are two issues which I have previously highlighted that I will unpack: the

[173] (AEVA) s.2(1)
[174] Ibid s.2(3)
[175] Ibid
[176] The Pathway Report. para.1.3

scope of proximity and the meaning of 'private use'. I hope to clarify the sources of concern within these issues to determine what steps are required to mitigate those concerns.

The first issue to consider is the scope of proximity. While the CPA operates under a strict liability regime and does not require proof of fault, not every claim will be caught by the legislation, particularly if property not intended for private use continues to be excluded. In these scenarios, the requirements of negligence must be met. We take these requirements from *Donoghue v Stevenson,*[177] where it was established that a successful claim in negligence requires that there is a duty of care owed, that such duty has been breached through negligent behaviour, and that the resulting harm was reasonably foreseeable. *Caparo Industries plc v Dickman*[178] further refined the test for negligence to state that there must be sufficient proximity between the parties, and that the liability resulting from the breach is fair, just and reasonable to impose. The understanding of proximity in the common law has been a highly contested point. *Donoghue v Stevenson* understood proximity to be "persons who are so closely and directly affected by my act that I ought reasonably to have them in contemplation when I am directing my mind to the acts or omissions which are called in question"[179] while *Caparo* gave a marginally wider ambit, suggesting that there "has to be a sufficiently definable class of person who is likely to be injured."[180] What is discernible from the case law is that proximity is intended to restrict the duty of care to a limited number of ascertainable people and not the general public.

All of this said, the issue is much less ambiguous when considering road users. The Pearson Commission noted that the duty of care owed by road users to other road users is "well settled and taken for granted."[181] The logic of this assumption can be explained by a discussion in *Perett v Collins.*[182] Although an aviation case, the two areas are of a similar nature regarding responsibility. Proximity was described in this case as follows:

> "Where the plaintiff belongs to a class which either is or ought to be within the contemplation of the defendant and the defendant by reason of his

[177] [1932] AC 562
[178] [1990] 2 AC 605
[179] *Donoghue v Stevenson,* p.580
[180] Ibid p.613
[181] Pearson Commission. Para.56
[182] [1999] P.N.L.R. 77

> involvement in an activity which gives him a measure of control over and responsibility for a situation which, if dangerous, will be liable to injure the plaintiff, the defendant is liable if as a result of his unreasonable lack of care he causes a situation to exist which does in fact cause the plaintiff injury."[183]

It is in having 'control over and responsibility for' driving the vehicle which creates sufficient proximity between road users. While this may seem unnecessary to state, it has not previously been the case that we have encountered product liability for vehicles in the capacity we will see from AVs. The primary difficulty we will encounter in these claims is who it is that has 'control over and responsibility for' the vehicle. The obvious candidate is the user of the vehicle, however if the AV has an accident while it is in its fully autonomous mode, the user has no responsibility and certainly no control over the vehicle's actions. The main competitor in the debate over control is the manufacturer. Since he is responsible for the software which will ultimately drive the car he has the responsibility to ensure it behaves safely on the road. It would be fair then to assume that the manufacturer will satisfy the relationship of proximity because they now have the 'control over and responsibility for' the actions of the AV.

There is a certain discomfort with the nature of this duty of care because it appears contradictory to our understanding of proximity. Traditionally the duty of care has always remained confined to a relatively small class of individuals, however the prominence of global business and motor vehicles makes this duty one which is effectively owed to the world at large. Thus, the ever-growing dominance of technology will require us to set aside the traditional understanding of proximity for one which operates on a global scale. This issue may also become more complex over time as attempts to create 'thinking' AI are underway.[184] If an AV has the ability to 'decide' how to handle a particular scenario it raises barriers towards holding the manufacturer accountable for any resulting damage. However, the issue of 'smart' AI is one which is far too large to tackle in one chapter, let alone a few paragraphs, so nothing further on the matter will be said here. It seems clear that, at least for now, there will be no problems in holding the manufacturer to be in a sufficiently proximate relationship with any party who could potentially suffer a loss from an AV.

[183] Ibid p.88
[184] Sample, "'It's able to create knowledge itself': Google unveils AI that learns on its own". The Guardian, 18 October 2017 (accessed 4 December 2017)

The next, and considerably more significant, problem relates to the meaning of 'private use' in the CPA. Because property not intended for private use is excluded from the CPA, and potentially also from the AEVA, it has the potential for severe consequences when pursuing damages. While in general the understanding of 'private use' is settled, there are unique circumstances presented by vehicles which will create a new set of challenges for this meaning. However, first it is prudent to explain the meaning and reach of 'private use' presently. There is not a considerable discussion on the meaning of private use. The primary discussion can be found in *Renfrew Golf Club v Motocaddy ltd.*[185] Here, a golf cart caught fire overnight and the golf club attempted to claim under the CPA for a defective product, however the manufacturers argued that since the golf club was a commercial building, the claim would fall outwith the scope of the CPA. The club submitted that it was a private golf club with exclusive access to members and thus was a building intended for private use, however this argument was not accepted by the court. It was held that the golf club was used for commercial activity and was available to a significant number of members, leaving it hard to classify the building as one subject to private use.[186] The commercial nature of the activity appeared to be material to the classification in *Renfrew Golf Club,* giving an indication as to the difference between private and non-private property.

The case's helpfulness only goes so far, however. It does not provide much guidance or advice for handling future dilemmas, especially those which may be more obscure than in the present case. It did not explain what it meant by commercial activity, or whether there is a threshold to meet for activities to be considered 'commercial'. Is there a certain amount of commercial activity required before the product can be considered to have a commercial function? *Renfrew Golf Club* simply stated that there was a "material amount of economic or commercial activity"[187] but without any discussion about general factors to consider when determining if this threshold is met. That there is so little discussion on the point at the moment is perhaps due to the relative simplicity of the concept. It is not often that it will be difficult to distinguish between whether property is used privately or commercially, and it is certainly not an issue that has been raised with the courts often. However, with the prominence of the shared economy and the potential for this to become a product liability concern with the introduction of AVs, this simplicity may come to an end.

[185] 2016 SLT 345
[186] Ibid para.18
[187] Ibid

Turning to vehicles, a brief detour to tax law is useful for demonstrating a specific difficulty that may arise with AVs. In tax law, the situations in which a vehicle is considered to be for private use become incredibly circumstantial and narrowly defined. The Income Tax (Earnings and Pensions) Act 2003 (ITEPA) considers vehicles made available to employees for their own personal use to be within the definition of 'private use' as long as that use is not for the employee's business travel.[188] Because tax law requires a categorisation of a vehicle, a vehicle's use can be determined in advance, however this certainty cannot be maintained in some circumstances. If we were to take this specificity and apply it to vehicles in general (i.e. for purposes other than tax) we would find that if the vehicle was in operation while on a family outing at the weekend, we would have a vehicle for 'private use', but if that same vehicle were used to travel to work, it would then become a commercial vehicle. This same boundary crossover is noticeable presently with Uber and other lift-sharing schemes and will become more difficult to deal with when the vehicles involved become products. The ITEPA, for example, suggests that vehicles made available to employees that are used for a car pool are not considered to be for 'private use.'[189] This insight may impact the way in which AVs are treated under schemes like Uber. Under the ITEPA rule, individual's personal vehicles may not be used for commercial activity, therefore car-pooling with one's own personal vehicle would cross that boundary. How would Uber drivers navigate a similar rule? If their AV is their personal product can it be used for commercial activity? I am certainly not recommending that we adopt the specificity of these tax definitions into product liability for AVs. The rigidness of the rules may become incredibly limiting, especially because of the frequency with which vehicles could dip in and out of private and non-private classifications. While we should aspire to maintain a flexible definition to accommodate these new scenarios, the tax law example gives an idea as to the potential void which could appear if steps are not taken to clarify the meaning of 'private use' in this context.

This distinction becomes more relevant for motor vehicles because there is not always one categorical use for one type of vehicle. We see a variety of cars being used for different purposes, and a lack of clear guidance on how to determine which classify as commercial property and which do not.[190] The Pathway Report questioned whether the distinction between

[188] Income Tax (Earnings and Pensions) Act 2003 s.118
[189] ibid s.118
[190] With the exception of vans or much larger vehicles purposed for commercial activity. See Road Traffic Act 1988 s.185

commercial property and private property remained relevant in the context of AVs[191] however this was not addressed in the response to the report, nor has there been any clear indication that this distinction would be eradicated by the proposed legislation. This deficiency becomes more apparent when a system like Uber is considered. Uber revolutionised the taxi industry by allowing individuals to transform their personal car into one for carrying passengers at their discretion. Immediately it becomes clear that the border between private and commercial use is blurred. While this does not create a problem for current accidents as they are not pursued under product liability, when AVs are introduced there become unnecessary distinctions between the treatments of vehicles. Consider, for example, the scenario where AV 'X' crashes into AV 'Y' while the passenger in AV 'Y' is headed to the shops. AV 'Y' is property intended for private use and so can quite easily fall under the CPA for damage because of a defective product. If, however, AV 'Y' was in fact a taxi of some description, it may no longer be considered property intended for 'private use' since it is now engaged in a commercial activity. Trickier still is if AV 'Y' is ordinarily a privately-owned vehicle, but because it is autonomous its owner has allowed it to collect a passenger who will be exchanging money for this service. If AV 'Y' here is engaged in an accident before it has reached the passenger, is it at this point engaged in a commercial activity, or is it still considered to be for private use? This makes the specificity of tax legislation look desirable because we could account for many fact-specific scenarios such as the ones just described. However, the uncertain nature of future events will leave us hanging if we resort to legislating for every scenario possible. Instead of this approach, it is more desirable to establish, at minimum, a coherent test to determine the point at which vehicles are no longer considered to be property intended for 'private use'. It is likely that the test could turn on the meaning of 'ordinarily' as used in the CPA, eliminating complications arising from infrequent dips into different categories of property, however even this is not watertight and could create challenges. This discussion very well might be for naught if the AEVA intended to include commercial property in its scope, but the lack of clarity means that until such time as that clarity is provided, the gap will remain.

While this is by no means an exhaustive discussion of the potential problems raised by AVs, it highlights concerns which are ascertainable in advance. Where issues are known, the law ought to be proactive in ensuring gaps are removed. Jonathan Smithers, the president of the Law Society of England and Wales, has stated that we ought to "look at the future, to

[191] The Pathway Report para.2.29

anticipate tomorrow's needs and contribute to the development of whatever legal measures are necessary."[192] There will undoubtedly be further concerns raised by AVs as the technology continues to evolve and become more prominent, providing further reason to assuage the hurdles we can currently anticipate.

### 4.3: Four scenarios

To conclude this chapter, I want to return to the four scenarios outlined in the introduction. After assessing some general concerns that the new legislation is yet to fully address, it is prudent to consider these four specific incidents to see if these concerns are remedied in practice, and where the gaps still remain. The four scenarios best represent the different conditions which result in pursuing a product liability claim. While it remains unclear whether commercial property will be covered by the AEVA, these scenarios will operate under the assumption that it will not be included.

Scenario 1: An owner of an AV suffers damage to his property. In using my AV, I have been involved in an accident and my property that is not my vehicle has been damaged in the process. If I am a consumer and my property intended for 'private use' suffers, the procedure is relatively straightforward. Because the property falls within the definition in s.5 of the CPA, I can pursue my claim through strict liability against the manufacturer. Further still, I am covered by the AEVA to recover from my insurer.[193] Where this becomes problematic is if my property is not intended for private use. If the property in question relates to my business, then under the CPA my claim is excluded from strict liability and I must seek a remedy through other means. While it is a possibility that the property is insured because of its commercial nature, it may not be and I may be limited to a claim through negligence or contract.

Scenario 2: An owner of an AV suffers damage to his vehicle. My AV has crashed but in the process has only damaged itself. This has explicitly been excluded from both the CPA[194] and the AEVA[195] because of the availability of contractual remedies for this type of damage.

[192] 'Legal System Must Keep Pace with Technology to be Fit for the Future, Says the Law Society' The Law Society, 22 June 2016 (accessed 4 December 2017)
[193] AEVA s.2
[194] CPA s.5(2)
[195] AEVA s.2(3)(a)

Scenario 3: A third party suffers damage to his private property. If I am a third party whose personal property has been damaged because of a defective AV, the process for recovering damages is narrower because of the absence of any contractual relationship with the manufacturer. Notwithstanding, given that the CPA was implemented precisely because of this kind of difficulty, there is ample provision for pursuing a claim since this type of damage falls within the meaning of 'private use' in s.5 of the CPA. Additionally, the AEVA's requirement that the insurer be held liable is also applicable to a third party who suffers property damage,[196] so third parties have access to swift compensation from the owner's insurer without needing to wade through a lengthy litigation process.

Scenario 4: A third party suffers damage to his commercial property. Much trickier is the scenario where a third party suffers damage to their property which is not intended for private use. Because the individual is a third party there are no contractual remedies at his disposal, and because the property in question relates to his business, he is not covered by the CPA or the AEVA. This is where the shared economy presents problems. If the commercial property in question is something traditional, such as a place of business or a transportation vehicle, these things will likely be covered by insurance. But what if the scenario was more specific? I send my AV to collect a passenger through a lift-sharing program, but on its way another individual's AV malfunctions and collides with mine. At this point in time my AV is engaged in a commercial activity, and if it is held to be a vehicle not intended for 'private use' at that time, I, a private individual, am not covered by the CPA or AEVA. Because I am not a company and do not have business insurance to cover me in these scenarios since it is my own personal vehicle, I am left to a common law negligence claim. And yet, if one minor detail changed the whole scenario would be treated differently: if my AV was instead on its way to collect me, it would no longer be performing a commercial function and would very clearly be covered by the CPA and AEVA.

This is an incredibly specific scenario and it is understandable that the law would not be equipped to cover it. However, the popularity of Uber and other similar companies means that this scenario may become more commonplace, particularly as the use of AVs becomes more common. However, continuing to exclude commercial property with no exceptions raises

[196] AEVA s.2(1)(c)

questions as to what the law is choosing to value. We are choosing the private/commercial dichotomy over principles of consistency in the law that require us to treat 'like cases alike'. Is the distinction in this scenario one that is so vast that it warrants different legal approaches? While the gaps aren't large, what these scenarios demonstrate is a particular issue created by the shared economy, where private individuals use their private property to engage in commercial functions. These moments cross boundaries and the law does not understand how to process this. It may not be complicated, but until we have definitive sources, whether from legislation or case law, it is unclear in what direction the law will go.

### 4.4: Conclusion

This chapter sought to cover general concerns raised by AVs when seeking a claim for damage. It first looked to concerns raised by the distinction made in the CPA between commercial and private property. While the distinction was upheld because it was felt that business owners would be in a better position to protect and compensate damage to commercial property, that reasoning may no longer apply. The AEVA neither explicitly confirms nor excludes this distinction, so we must assume for the present that it remains. We also considered the understanding of proximity as it relates to road users. Avoiding negligent behaviour is not intended to be a duty owed to the world at large, and yet driver responsibility appears to be such a duty. There are several potential parties that could be considered responsible for an AV – the driver, the manufacturer, or one day perhaps an intelligent AI – but the nature of the duty would still allow these parties to fulfil the proximity requirements to be held responsible for the AVs actions. The question then becomes: who is most appropriate to hold responsible?

The commercial/private property divide creates issues with the understanding of private use. Until now there have been few issues understanding the difference between these categories, however the use of AVs for ride sharing schemes challenges the prior definitiveness of private and commercial. The nature of the shared economy means that vehicles are sometimes used for both the private use of the individual and as commercial vehicles as part of a business. The novelty of a product performing this function means a lack of guidance for navigating the overlapping categories, and it would be prudent to consider how such issues will be handled. We finished the chapter by returning to four scenarios outlined in the introduction

to highlight where there are gaps in the legislation in pursuit of a claim for damages. The main concerns lie with AVs which are privately owned by individuals but which are used for commercial functions. This overlap between the commercial and private categories has not been considered by the present legislation, and it is unclear how such a claim would be handled. The shared economy challenges the justifications originally given for the divide between private and commercial property, and it is time to reconsider the reasoning to ensure that individuals engaged in commercial activity are not unjustly burdened by a rule that was not enacted with them in mind.

## Chapter 5: Innovation and The Scientific Defence

Section 4 of the CPA contains several defences available to manufacturers of products in an attempt to leave space for innovation. While the majority of the defences are relatively uneventful, what has become known as the scientific defence has sparked many debates and remains one of the more controversial issues in product liability at present. In brief, the defence allows manufacturers to avoid liability if the state of scientific knowledge at the time of production did not allow for the defect's discovery.[197] Two main branches of questions stem from this provision: those relating to 'knowledge' and those relating to 'discovery'. Given the ambiguity of the provision there is significant debate over the interpretation and extent of these definitions. Furthermore, the conspicuous gap in litigation surrounding the scientific defence leaves us uncertain about its meaning in the past, and gives us little to work with moving forwards with AV. The interpretations of 'knowledge' and 'discovery' will be vital for AVs; a loose interpretation may leave manufacturers with little responsibility to be proactive in searching for the vehicle's limitations, however a strict interpretation will leave no room for error in a highly experimental field.

While many are in support of the defence, albeit to varying degrees of strictness, there are simultaneously calls for the defence's removal. The European Directive did not make the scientific defence mandatory for Member States, but the UK chose to adopt the defence in full. With the ever-increasing technological complexities of modern day products, it is perhaps time to re-evaluate the defence's inclusion. While there are many elements to this debate, relevant to this thesis are the ways in which AVs will contribute to the ongoing discussion. Therefore, this chapter seeks to discuss two points. First, it will look at the definitions of knowledge and discovery as they relate to the scientific defence and will analyse what may happen if a claim involving an AV fell to requiring the use of the defence. Second, it will consider the challenges faced by the scientific defence and will discuss whether these challenges are sufficiently insurmountable for there to be a justifiable argument for removing the defence.

[197] CPA s.4(1)(e)

### 5.1: What is the scientific defence?

Although the move towards strict liability for products was welcomed, it was thought that too strict a regime would stifle innovation. Hence, the Product Liability Directive created defences to be available to the producers in order to maintain a certain level of freedom and security. These defences are set out in Article 7 of the directive. Article 7(e) states that a producer will not be held liable if he can prove that "the state of scientific and technical knowledge at the time when he put the product into circulation was not such as to enable the existence of the defect to be discovered." The defence was not mandatory for member states to incorporate although many chose to include it in their domestic legislation. However, the UK's inclusion of the defence has not been simple. The UK chose not to use the wording provided in the directive, and even this small difference has created friction in the law. The CPA states that the defence is available if it can be proved that "the state of scientific and technical knowledge at the relevant time was not such that a producer of products of the same description as the product in question *might be expected* to have discovered the defect (emphasis added)."[198] While there is very little difference between the two iterations of the defence, the reference to expectations in the CPA has led some to believe that the defence includes too much scope for a finding of reasonableness and takes the CPA further away from the strict liability regime it claims to be. Indeed, this question was presented in *Commission v UK,*[199] where the court was asked whether or not the UK had failed to properly implement the directive. It was suggested that because the UK included in their defence reference to other producers it not only made the test less objective but also lowered the burden of proof.[200] The court ultimately held that the UK did not fail to implement the directive. It stated that there is no restriction on the knowledge to be taken into account and does not depend on the subjective knowledge of the producer so deemed the wording of the CPA to be sufficiently similar to the directive.[201] Despite this ruling the defence has remained controversial and it continues to be debated amongst legal scholars in the UK. The majority of the discussion focuses around the extent to which the defence should operate, seeking to properly understand its parameters.

[198] Ibid
[199] *Commission v UK* [1997] 3 C.M.L.R. 923
[200] Ibid para. 6-7
[201] Ibid judgment para.33-37

The first contested parameter is the understanding of 'knowledge'. The hint of reasonableness in the CPA creates a slight instability in the strictness of knowledge in the defence. At what point does knowledge become sufficient such that the producer must take action on the basis of such knowledge? While the directive suggests that this standard is rigid, referencing the objective 'state of scientific and technical knowledge', *Commission v UK* suggests otherwise. The case used the example of a study published in a remote Chinese village to demonstrate the constraints on which information constitutes knowledge.[202] More relatable than this, Newdick suggests information could be located in a "confidential, internal, memorandum from a company in an unrelated industry"[203] and following the reasoning from *Commission v UK i*t would be unreasonable to expect producers to be aware of such information as inaccessible as this. However, these instances of considerably inaccessible information will not be the most common hurdle faced in relation to this question. More common will be the boundary between what is common practice in the industry and what is considered too obscure to pose a risk. In *Bolton v Stone* it was held that the relevant standard for negligence is whether the risk of injury was so remote that a reasonable person may not have anticipated it.[204] Although the CPA is supposed to have moved on from the negligence standard this sounds similar to the rationale for the defence given in *Commission v UK*. Stapleton feels strongly that the defence reintroduces a fault standard to product liability despite the reformers attempting to leave negligence behind.[205] There are certainly elements of fault given that this is a defence and requires proof of actions or inactions, yet it cannot be said that it maintains the same subjective test as negligence. Nevertheless, it does seem that the need to connect the defect to the information can be traced to connecting the risk of injury with the negligent behaviour from *Bolton v Stone.*

An understanding of where the limit of knowledge may be can be aided with a consideration of healthcare law. Although a mostly unrelated field, there have been considerable discussions surrounding best practice in medicine that may offer insight here. In 1955, *Hunter v Hanley* established that a doctor will have behaved negligently if there is a usual and normal practice that he has deviated from, and there was no suggestion in the wider

[202] Ibid para.24
[203] Newdick, 'The Development Risk Defence of the Consumer Protection Act 1987' 1988 Cambridge Law Journal 47(3) 455 p.460
[204] *Bolton v Stone* [1951] AC 850 58
[205] Stapleton. *Product Liability.* P.49

medical practice that a doctor acting with ordinary skill and care would have adopted the course of action that he has.[206] *Bolam v Friern Hospital Management* expanded on this definition, explaining that "a man is not negligent, if he is acting in accordance with such a practice, merely because there is a body of opinion who would take a contrary view. At the same time, that does not mean that a medical man can obstinately and pig-headedly carry on with some old technique if it has been proved to be contrary to what is really substantially the whole of informed medical opinion."[207] Doctors must abide by a practice which is accepted by the medical community. It does not have to be the most common or widely accepted practice, but it must be reasonable to adopt. Much more recently, *Bolitho v City and Hackney Health Authority* stated that "if it can be demonstrated that the professional opinion is not capable of withstanding logical analysis, the judge is entitled to hold that the body of opinion is not reasonable or responsible."[208] Therefore, if a doctor adopts a course of action which is not generally known or accepted, and the path is illogical because the body of opinion suggests as much, then the doctor may be found negligent. What we can take from this is that if there are general industry standards which are known and accepted then this is what is taken to be reasonable and normal practice. If there are obscure tests and studies which are not widely known or respected, it may not be reasonable to expect producers to adapt their behaviour according to such knowledge. This restriction in medical practice is similar to the limits of accessibility in the CPA, and similar to what Howells refers to as "totally unexpected risks" and "potential but still unexpected risks."[209] It would appear that if a risk is not known to the producer in the sense that there has been no research about the potential hazard the risk poses, it is unlikely that he will be expected to know of the risk. Hence, we have a test for the state of scientific and technical knowledge that is objective, by considering the general knowledge of the industry rather than the producer, and yet retains elements of reasonableness to ensure sufficient innovation may take place.

The second element to the scientific defence is the ability to discover the defect. This element connects the information with the potential harm caused, much like the test in *Bolton v Stone* mentioned above. If the information available to the producer does not indicate that there is a risk of harm, i.e. that the information can discover the defect, then it cannot be said

[206] *Hunter v Hanley* 1955 SC 200
[207] *Bolam v Friern Hospital Management Committee* [1957] 1 WLR 582 p.587
[208] *Bolitho v City and Hackney Health Authority* [1998] AC 232 p.243
[209] Howells, 'Product Liability for Nanotechnology' p.384

that the producer would have known about the risk. It was put forward in *Commission v UK* that this requirement meant being able to show that "it was impossible, in light of the most advanced scientific and technical knowledge objectively and reasonably obtainable and available, to consider that the product was defective"[210] and this was accepted. While the defence has been upheld, it is still not entirely clear what it means. Mildred writes:

> "the competition of interpretation is between absolute undiscoverability and undiscoverability by reasonable means. Proponents of the first maintain that the second would reduce the regime of the Directive to one of negligence. Proponents of the second refer to Recital 7 to the Directive which establishes a fair apportionment of risk between producer and consumer as the bases for the defences available to exonerate the producer and argue that the narrow interpretation, entailing a requirement to provide a worldwide negative, would deprive the defence of any practical effect."[211]

In interpreting this element of the defence, we either admit that the CPA is simply rebranded negligence and retains tests of reasonableness, or we take a hard-line approach and expect the highest, near-impossible standard of thoroughness. This apparent divide may not be quite as accurate as Mildred makes it sound. Pugh and Pilgerstorfer, commenting on *Abouzaid v Mothercare,* note that as soon as there is a possibility of discovering the defect the producers can no longer use the defence.[212] In *Abouzaid* the court held that the producers could not rely on the scientific defence, saying that "there was no difficulty in discovering the defect by a simple practical test … no advance in scientific or technical knowledge since 1990 was required to enable that test to be carried out. The only reason that it was not carried out before 1990 was that manufacturers (it seems) had not thought of doing so."[213] This demonstrates a fairly high threshold for the defence, and proves the objective standard applied to the test. While there are elements of reasonableness and responsibility, they are assessed objectively, giving us a clear distinction from negligence. The defence does not seek to ask if the producers had acted reasonably to consider the particular risk involved and then act upon it, otherwise it

[210] *Commission v UK* para.26
[211] Mildred, 'The Development Risk Defence' in Fairgrieve, *Product Liability in Comparative Perspective.* 167 p.170
[212] Pugh and Pilgerstorfer, 'The Development Risk Defence – Knowledge, Discoverability and Creative Leaps.' 2004 Journal of Personal Injury Law 4, 258 p.264
[213] *Abouzaid* para.46

is entirely possible the producers may not have been held liable in this instance. The general state of knowledge was sufficient to uncover that a faulty elastic strap may result in injury if it slips or breaks.

A similar approach was taken in *A v National Blood Authority*, where it was found that although it was agreed that a screening test to discover Hepatitis C in the blood did not exist at the time[214] the fact that the risk was known by the producers disqualified them from being absolved under the defence.[215] Both *A v National Blood Authority* and *Abouzaid* demonstrate fairly harsh approaches to the understanding of discoverability. In *A* the defect couldn't be uncovered but it was known, and in *Abouzaid* the defect wasn't known but could easily have been discovered. It is hard to say that the producers in these cases weren't acting reasonably, solidifying further that the reasonableness the defence uses is not necessarily as lenient as the reasonableness we see in negligence. It is a reasonableness more closely associated with those in professions with an added duty of care, such as doctors and employers. Prior to hearing *A v National Blood Authority,* Stapleton discussed the Thalidomide disaster in relation to creative leaps and discoverability, and observed that once you are willing to hold that a defect is discoverable despite there being no research or reason for testing to have been undertaken to prove its existence, it will be impossible to ever demonstrate that a defect was undiscoverable.[216] Indeed, Hodges notes that "knowledge of certain observed facts at the time the product was put into circulation does not imply that all conclusions which might subsequently be postulated, deduced or proved from those facts are 'discoverable' at that time."[217] Both these observations are reasonable comments to make, and especially in the aftermath of *Abouzaid* and *A v National blood Authority* one may question what information would not be considered 'known' or 'discoverable'. It would appear that both these cases are strong support for limiting the ambit of reasonableness in this defence. Only risks which are undiscoverable in the strictest sense seem to fall under the defence. Although the inclusion of the phrase 'might be expected' in the CPA's defence suggests a wider reach for reasonableness, it seems clear that the courts are maintaining a high threshold for success to ensure producers act according to the highest standard, and yet still allowing protection where totally unexpected risks do develop.

[214] *A v National Blood Authority* para.12
[215] Ibid para.76-78
[216] Stapleton. *Product Liability.* P.240-1
[217] Hodges, 'Development Risks: Unanswered Questions.' 1998 The Modern Law Review 61(4) 560 p567

### 5.2: Should the scientific defence remain?

As we have seen in the last section, the scientific defence is not met without challenges and controversy. On one hand we need the defences to ensure producers are not prevented from taking risks in innovation, but on the other it seems to place the burden for those risks on the consumers. Many are satisfied with the present balance of risk; Hodges argues that it is appropriate for consumers to bear some level of risk if they are interested in sharing the rewards of innovation.[218] Innovation, after all, does not often happen for its intrinsic value. Producers will always be improving their products for profit, to make more marketable and appealing products, so it only makes sense that the wider community bears a small risk if the producers get caught off guard with unforeseen issues. This argument runs the risk, however, of creating a culture where consumers are taken advantage of because they too reap the benefits of experimental products. This is what Mildred and Howells suggest in response to Hodge's defence of the producer. They argue that the very nature of the CPA demonstrates that producer's interests are not paramount, and this should not be forgotten.[219] The producer stands to gain just as much, if not more, than the consumer, so it is difficult to use the community argument that Hodges presents to suggest that producers be able to develop freely without consequence. Having said that, the defence, as we have seen, requires a high threshold and it is not often that it will be utilised. The directive was created with a fair apportionment of risk in mind, and in a 2006 review of the directive the commission did not believe the directive required amending,[220] suggesting that they feel this balance is being met.

Despite what appears to be a reasonable compromise between producers and consumers, The European Consumer Organisation, the BEUC, is calling for abolition of the development risks defence.[221] They are not alone in this sentiment; Mildred and Howells also suggest that the only solution to correct the inherent issues with the defence would be to remove it.[222] Of course, this 'solution' hinges on whether or not one believes there is a problem that ought to be redressed. Because the CPA covers a multitude of industries, it is entirely possible

[218] Ibid p.562
[219] Mildred and Howells, 'Comment on "Development Risks: Unanswered Questions"' 1998 The Modern Law Review 61(4) 570 p.572
[220] Commission of European Communities. *Third Report on the application of Council Directive on the approximation of laws, regulations and administrative provisions of the Member States concerning liability for defective products.* 2006
[221] BEUC. *Review of Product Liability Rules.* 2017 para.2.2
[222] Mildred and Howells. 'Comment' p.573

that it feels far too restrictive in some areas and not strict enough in others. If we are to add AVs to the industries subject to the CPA, how will it contribute to this discussion? First, looking at the knowledge requirement, the pioneering nature of an entirely new field of research is both a blessing and a curse: producers have very little information to work with and so having an understanding of potential defects is severely limited, however this does provide an almost too easy defence. Newdick's comments about difficulties with knowledge only located in closed-door papers and memorandums[223] seem fitting here; producers, in attempts to remain competitive, keep their research close to their chests and as a result there may not be as much knowledge sharing as is necessary for the overall safety of the field. Will information uncovered by one developer mean another developer can no longer utilise the defence, even if that information remained internal to the company? Because the leading AV developers are thoroughly scrutinised by the press some of these potential dilemmas may be mitigated, but it doesn't remove the risk entirely. It may be necessary to enforce publication requirements for new developments to ensure all developers have access to the most advanced knowledge possible. Otherwise the balance of risk may certainly be unfairly resting on consumers. Howells observes that in high tech industries the producers are also the leading researchers, so access to knowledge is likely to be less of an issue,[224] so it may be that these concerns are for naught if producers are publishing and sharing their research with each other.

On the issue of discoverability, we encounter a similar problem. Just as we face a general lack of knowledge because of the nature of the field, we also face an inability to 'discover' every new issue that will arise. The barrier producers will face, however, is that they will technically have the ability to discover the vast majority of defects. The majority of the incidents AVs have been involved in have been due to a lack of foresight – the producers simply have not tested every possible variable. One of the first major deaths caused by an AV crash was due to the vehicle being unable to distinguish between a trailer and the colour of the sky.[225] Another unusual predicament AVs have encountered has been difficulty in reading road lines in areas with poor markings or roadworks with temporary lanes.[226] These things are not due to technological limits, but just an unforeseen consequence of asking a finite amount of code to

[223] Newdick, 'The Development Risk Defence' p.460
[224] Howells, 'Product Liability in Nanotechnology' p.388
[225] Levin and Woolf, 'Tesla Driver Killed While Using Autopilot was Watching Harry Potter, Witness Says' The Guardian, 1 July 2016. (Accessed 25 July 2018)
[226] Sage, 'Where's the Lane? Self-Driving Cars Confused by Shabby US Roadways' Reuters, 31 March 2016. (Accessed 25 July 2018)

interact with an infinite number of variables. Soudi discusses the problem of AVs inevitably having to interact with humans on the road, and such interactions not always being predictable.[227] While AVs can be programmed to read road signs, lane markings, and traffic signals, can they be programmed to understand what Soudi calls the 'language of driving'? Will they be able to differentiate between the contextual meanings humans attach to flashing lights and beeps of the horn? Moreover, will these incidents be considered defects and, if so, were they 'discoverable'? Many of these errors are not outwith the technological capacity of AVs or producers, it would seem that in these cases the producers simply were not aware they would become problems so didn't include code to handle it. If we follow the precedent given in *Abouzaid,* it would seem that producers will not be able to utilize the scientific defence in these scenarios because they had not thought of running the algorithm against these issues. However, this almost seems counter intuitive to the purpose of the defence. The scientific defence was included in the CPA to provide producers with a defence against unexpected risks. Given the infinite number of variables encountered when asking a program to interact with the world it will not be possible to test every eventuality in advance. The producers have built a system which they believe is sufficiently adaptable to the most commonly encountered scenarios, and it does not seem just that they should be penalised for failing to foresee the future. Of course, while the UK courts are obliged to consider *Abouzaid,* there is nothing preventing them from overturning the ruling or adapting the law if necessary, but the case has established a strong precedent from which the courts will not easily deviate.

Are these concerns sufficiently arduous that they would justify removing the defence? It would not seem so. While there are legitimate concerns surrounding the scientific defence, we have not seen it used frequently enough to understand the practical effects of its existence. Additionally, the mere existence of the legislation itself will act as a deterrent for producers not engaging in the most thorough research possible to eliminate any potential risks, so the lack of cases is almost an indication of its effectiveness in ensuring a higher standard of product safety. The literature discussing the defence's removal is mostly hypothetical and, while arguments from principle are extremely valuable, unless these theories can be demonstrated it is unlikely that the UK Government will take any action. Because the main sources of the defence's limits have come from case law, it is not altogether impossible to adapt it, within

[227] Soudi, 'Driverless Cars Might Follow the Rules of the Road, But What About the Language of Driving?' The Conversation, 8 January 2018 (Accessed 25 July 2018)

reason, as new scenarios unfold. Technological development has progressed considerably since *Abouzaid* and it may be that the approach to discoverability in 2000 is no longer workable almost twenty years later.

## Chapter 6: Conclusion

The introduction of a technology so pervasive as AVs will no doubt come with many challenges, both foreseeable and unexpected. To attempt to create a programme capable of executing a skill as complex and variable as driving is no small feat and in isolation is a testament to the capabilities of technology today. While we ought to spend time marvelling at the accomplishments of the developers of this technology, they are not excluded from being subject to our laws and regulations. Society has spent so long fantasising about how revolutionary AVs are and how much our lives will change because of them that it has almost forgotten that progress does not happen in a bubble. AVs are being tested on our roads and are interacting with an unsuspecting public, with the assumption that the autonomous technology is limitless in its abilities. The string of accidents in recent years has perhaps enlightened us to the danger these vehicles will pose throughout their evolution and reminds us that technology is not infallible. We must remove ourselves from the optimism and wonder of progress and consider what happens when everything fails. This thesis has sought answers to that very question in relation to product liability laws, and what is immediately clear is that the journey is far from over.

We first looked at theories of delictual liability to establish the meaning of fault in our legal system. The two underlying theories of loss and responsibility guide all our legislative decisions, whether overtly or not. The idea behind creating a strict liability scheme for product liability was to remove the elements of fault from the legislation to focus on rectifying loss in all but the most exceptional of circumstances. However, as we saw, neither theory is sufficient on its own: responsibility regimes cannot always rectify harm where there are gaps or overlaps in who is responsible, and loss regimes do not account for non-economic losses suffered. We see these tensions play out in the CPA, where we see fully strict liability where defective products cause damage, and yet we also maintain defences to ensure that producers have some opportunity to escape liability if the damage was truly unavoidable or unattributable. The issue of software updates perfectly encapsulates the difficulties balancing loss and responsibility. The AEVA places responsibility for updating software on the owners of the vehicles so they will bear the burden of liability if they choose not to update the technology. While well intended, this shifts the responsibility for maintaining the highest level of technology onto the consumers and provides an easy way for manufacturers to evade responsibility for outdated

software. However, it may not be just to require manufacturers to be responsible for lazy consumers, and it is clear that such black-and-white legislation will not fare well in the long term. There will inevitably be circumstances which were not contemplated by the legislators and it may be harder to amend legislation in light of new information than to create flexibility to allow for legal as well as technological progress.

The other major facet of fault discussed was the limits of the reasonable driver. There are many issues of causation which will undoubtedly arise as a result of AVs functioning at L3 (see fig.1.1), and the legislation ought to reflect these complications. We have observed a difficulty in balancing loss and responsibility as the government reports wrestled with whether a fault-based regime would remain most suitable to handle driver responsibility. While acknowledging the unique difficulties faced at this point in the development, no changes were made, suggesting either a reluctance to fully consider the present complications or a failure to consider how long we may remain in this intermediate period. If we recall Waldron's story about Fate and Fortune (where two identical actions resulted in Fate causing an accident and Fortune evading, purely by luck) we understand why a fault-based regime, particularly with the current level of AVs, will prove complicated and potentially unjust. However, it is important to remember that this concern is specific to the duration of the AV development process, and should society reach a point where all vehicles are fully autonomous with no driver input, then there will no longer be a need for fault on the roads. However, a responsibility to be forward-thinking should not be at the expense of present issues, and not addressing how to rectify a potential imbalance of fault is an oversight. This discrepancy between loss and responsibility will be seen in negligence if claims of fault are brought against AV users, but may also be seen in the assessment of software updates as set out in the AEVA.

Next, we took a closer look at the CPA to analyse the meaning of defect, the burden of proof, and how we adequately assess consumer expectations. What is immediately apparent is that there are considerable hurdles to overcome when this question is inevitably raised in relation to AVs. Because the test for defect grounds itself in the public's expectations of safety, we have an incredibly inconsistent approach to AVs and a consumer opinion that may be wildly inaccurate. As fig.1.1 helps demonstrate in the introduction, automation is not an all-or-nothing concept, but it is not apparent that the public are aware of this fact. Large groups of the public will be far too faithful in AVs abilities, while other pockets of people will be inherently

distrustful because of a lack of control. Given that statistically, people tend to perceive a lack of control as carrying a greater risk, this creates a public opinion which is varied, inconsistent, and inaccurate. Which of these groups are we to use as guidance for the 'general opinion'? It may result in the courts choosing the group which most aligns with their own personal view if there is not one obvious opinion which dominates the public sphere.

Adding to these discrepancies is a series of potentially conflicting judgments about how much proof is required to show that a product is defective, and moreover what elements of the defect are required to be proven. This complication will be multiplied with a product as complicated as an AV, especially if a coding error is to blame for the damage. To add to this lack of clarity, it is also not certain whether the ruling in *Boston Scientific* will apply to AVs, deeming all of a producer's AVs at the same level of software defective should one of them be found to contain a defect. Most of these concerns exist solely because we have not had a case to clarify how the law will address these scenarios, however it is not in the best interests of manufacturers or consumers to sit around waiting for these issues to arise. While we do not want to confine ourselves to rules which will not apply later because of unforeseen circumstances, we should seek to have general rules in place to govern these issues so that if, and when, these cases are presented to the courts we have an idea of how the law will handle them.

Our third issue concerned the differences between private and commercial property, with particular regard to how these definitions are challenged by the rise of the shared economy. The CPA created an exclusion for commercial property under the justification that companies would be in a position to insure themselves for potential damage from their products, and to offset those costs through small increases in price. However, a modern economic model making use of a shared economy challenges the divide between private and commercial property to a point where the exclusion in the CPA may no longer be justifiable. Ride sharing companies have utilized individual's private vehicles for a commercial scheme, creating questions about whether these vehicles are private, commercial, or both. With the potential to add AVs into this mix it seems unfair that consumers would be able to claim under the CPA if they were using their AV in a personal capacity but would be excluded from the scheme if they were using their AV as part of a ride sharing scheme. It is only in a narrow category of scenarios that this issue becomes apparent, so it may not be necessary to overhaul the system, but it does raise questions

about whether we value this dichotomy over ensuring equal treatment in like cases. A reconsideration of this exclusion is essential for AVs to become a commonplace product on our streets, whether this reconsideration leads to drastic changes or a small addendum.

The final question we asked was whether the scientific defence is still appropriate in an age of complicated and pioneering technologies. The scientific defence remains a controversial inclusion in the CPA, and many desire its abolition. The two main elements of the defence, knowledge and discoverability, have been given a high threshold by the courts, a threshold which almost makes the defence ineffective. The limits of the defence presently result in any information which was either known but was not discoverable (*A v National Blood Authority*), or was discoverable but not known (*Abouzaid*), as precluding producers from using the defence. Both of these judgments are viewed as fairly harsh, and they leave us wondering exactly what kind of defect would have to arise to qualify a producer for the defence. While this remains in line with the philosophy of the CPA by prioritising consumers' interests over the manufacturers', it seems that the defence is unusable despite it being established that it has a marginally wider ambit than that found in the original directive. However, the lack of cases citing the scientific defence leave that part of the legislation relatively untested, so it may be that these cases will become the rare exceptions as time progresses. Notwithstanding, it may create some concerns for AV manufacturers because it would appear that their position will never allow them to make use of the defence. The defects that we have seen so far in AVs have all been issues which were entirely discoverable, but due to an infinite number of possible events arising, have simply not been accounted for in the initial stages of development. Following the precedents currently established manufacturers are left without any way to defend themselves from scenarios which were, by all reasonable means, unforeseeable. It remains to be seen whether we want this high threshold to be maintained in the interests of consumer protection, or whether we find that producers feel stifled by the impossibility of defence. It seems ironic that a legal system which cannot account for all possible future scenarios has established parameters which will punish manufacturers for not being able to do just that. This alone may be cause to at least consider whether the scientific defence is in need of review given the unforeseen developments since its initiation.

This assessment of the UK's product liability laws leaves us with a mixed review. There are certain elements that seem to be relatively functional, while there are others that are more strongly impacted by the introduction of AVs and will require adjustments. The AEVA has

addressed many of the initial concerns about insurance, however there are yet to be considerations of the relevance of the private/commercial property distinctions or whether the scientific defence can be maintained in its current form. The solutions to these issues may become apparent as further testing is undertaken, more discussions are had, and other issues outwith product liability are resolved, however it appears that while some positive steps have been taken by the UK Government to ensure that the law keeps pace with technology, many more are needed before we see a seamless integration of AVs.

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