CA on appeal from (2) Northampton County Court (Judge Charles Harris QC) (1) QBD (Mr Justice Gray) [2007]EWHC 1667 (QB) before Ward LJ; Dyson LJ; Thomas LJ. 28th April 2008.

Lord Justice Thomas:

Introduction

1. These two appeals were heard together because they raise an issue as to the approach the judge was entitled to take to the determination of proof of causation where alternative mechanisms of causation were put before the court. In each case the sole issue before the court was whether the respondent to the appeal who had suffered the damage could prove on a balance of probabilities that a defect had caused the damage sustained; each appellant contended that the judge had adopted a train of reasoning which the House of Lords made clear in *The Popi M* [1985] 1 WLR 948 (***Rhesa Shipping Co SA v Edmunds***) was impermissible.

The Popi M and the approach to the issues of causation

2. It is necessary to refer to the trial judge's decision in the ***The Popi M*** [1983] 2 Lloyd's Rep 235 as it contained what the trial judge described as a striking and novel feature of the expert evidence – all experts put forward explanations of the cause of the loss which were acknowledged to be highly improbable; each explanation was supported as the most likely explanation only because any other hypothesis was regarded as almost (if not altogether) impossible. The owners of the ship claimed against underwriters for her total loss which had occurred in calm weather. It became common ground that the vessel had sunk because of an ingress of sea water through a hole in the side plating. Underwriters contended that the vessel had been unseaworthy and that had been the proximate cause of the entry of water. The trial judge made no finding that the vessel was seaworthy or that she was unseaworthy; he was left in doubt. The owners put forward a case that the hole in the side plating had been caused by contact with a submerged and moving submarine by eliminating other possibilities; the judge concluded that contact with a moving submarine was so improbable that if he were to conclude that it was the likely cause of the loss he had to be satisfied that any other explanation for the casualty had to be ruled out. The underwriters put forward a case that the hole had arisen through wear and tear and provided a detailed explanation as to how that had happened. The judge rejected that detailed explanation and was therefore left with a choice between the owner's submarine hypothesis and the possibility that the casualty occurred as a result of wear and tear but by means of a mechanism which remained in doubt. He concluded that, despite the inherent improbability and despite the disbelief with which he had been inclined to regard it, the collision with the submarine had to be accepted on the balance of the probabilities as the explanation of the casualty.

3. The decision was upheld in the Court of Appeal, but reversed in the House of Lords. Lord Brandon of Oakbrook, giving the only substantive opinion, described the approach of the trial judge as erroneous by reference to the inappropriateness of applying what was described as the dictum of Mr Sherlock Holmes. First, a trial judge was not compelled to choose between two theories, where the evidence was unsatisfactory; he could decide the case on the basis that the claimant had not proved his case. Secondly it was not possible to proceed on the basis of eliminating the impossible and deciding that the remaining explanation, however improbable, must be the cause, unless all the relevant facts were known; that state of affairs did not exist, as the ship had sunk in deep water. Thirdly, the concept of proof on a balance of probabilities had to be applied with common sense. It required a judge, before he found a particular event occurred, to be satisfied on the evidence that it was more likely to have occurred than not. If the judge concluded that the occurrence of an event was extremely improbable, a finding by him that it nevertheless was more likely to have occurred than not did not accord with common sense. He concluded:

   "In my opinion Bingham J. adopted an erroneous approach to this case by regarding himself as compelled to choose between two theories, both of which he regarded as extremely improbable, or one of which he regarded as extremely improbable and the other of which he regarded as virtually impossible. He should have borne in mind, and considered carefully in his judgment, the third alternative which was open to him, namely, that the evidence left him in doubt as to the cause of the aperture in the ship's hull, and that, in these circumstances, the shipowners had failed to discharge the burden of proof which was on them."

4. The circumstances of the case were, as Bingham J pointed out in his judgment, novel and striking. Some of the features were particular to a proof of loss by perils of the sea under a policy of marine insurance: see the judgment of Colman J in ***Glowrange v CGU Insurance*** (2001) WL 720222. ***The Popi M*** was a very unusual case and as these two appeals demonstrate, the difficulties identified in that case will not normally arise. In the vast majority of cases where the judge has before him the issue of causation of a particular event, the parties will put before the judges two or more competing explanations as to how the event occurred, which though they may be uncommon, are not improbable. In such cases, it is, as was accepted before us by the appellants, a permissible and logical train of reasoning for a judge, having eliminated all of the causes of the loss but one, to ask himself whether, on the balance of probabilities, that one cause was the cause of the event. What is impermissible is for a judge to conclude in the case of a series of improbable causes that the least improbable or least unlikely is nonetheless the cause of the event; such cases are those where there may be very real uncertainty about the relevant factual background (as where a vessel was at the bottom of the sea) or the evidence might be highly unsatisfactory. In that type of case the process of elimination can result in arriving at the least improbable cause and not the probable cause.

5. In ***Datec Electronic Holdings v UPS*** [2007] UKHL 23 ([2007] 1 WLR 1325, [2005] EWCA Civ 1418)) one of the issues was whether the claimants had discharged the burden of establishing on a balance of probabilities that the

loss of packages was caused by theft by an employee of UPS. As Richards LJ stated in his judgment at paragraph 67, there was sufficient evidence in that case and the surrounding circumstances to enable the court to engage in an informed analysis of the possible causes of the loss and to reach a reasoned conclusion as to the probable cause. He considered all of the possible causes and concluded that theft by employees was the probable cause of the loss. He concluded at paragraph 83:

"Nor do I see any inconsistency between my approach and the observations of Lord Brandon in The Popi M. The conclusion that employee theft was the probable cause of the loss is not based on a process of elimination of the impossible, in application of the dictum of Sherlock Holmes. It does take into consideration the relative probabilities or improbabilities of various possible causes as part of the overall process of reasoning, but I do not read The Popi M as precluding such a course. Employee theft is, as I have said, a plausible explanation and is very far from being an extremely improbable event. A finding that employee theft is more likely than not to have been the cause of the loss accords perfectly well with common sense. Thus the various objections to the finding made by the trial judge in The Popi M simply do not bite on the facts of this case"

On appeal, the approach of Richards LJ was criticised by counsel for UPS on the basis that he had been lured into a process of elimination (which could at best arrive at a conclusion as to which of many possible causes was the least unlikely) rather than a conclusion as to any cause which was more probable than all the others viewed together. In giving the only substantive opinion on this issue, Lord Mance rejected that criticism, though pointing out at paragraph 50 that:

"Inevitably, any systematic consideration of the possibilities is subject to a risk that it may become a process of elimination leading to no more than a conclusion regarding the least unlikely cause of loss."

6. As a matter of common sense it will usually be safe for a judge to conclude, where there are two competing theories before him neither of which is improbable, that having rejected one it is logical to accept the other as being the cause on the balance of probabilities. It was accepted in the course of argument on behalf of the appellant that, as a matter of principle, if there were only three possible causes of an event, then it was permissible for a judge to approach the matter by analysing each of those causes. If he ranked those causes in terms of probability and concluded that one was more probable than the others, then, provided those were the only three possible causes, he was entitled to conclude that the one he considered most probable, was the probable cause of the event provided it was not improbable.

7. The application of this approach by a court in considering a claim under the Consumer Protection Act 1987 in respect of a defective product can often be simpler. Under ss.2 and 3 of the Act if a person is injured by a product, his claim succeeds if he establishes there is a defect in the product and that defect caused the loss unless the defendant can rely on one of the statutory defences. In determining whether the loss or injury has been caused by a defect or by some other cause, although the process of reasoning may involve an explanation of how the defect was caused, the task of the court is simply to determine whether the loss was caused by the defect and not by another cause. As is apparent from the first of the appeals, that distinction is important and can make the task of the court a simpler one, as no doubt Parliament intended.

THE FIRST APPEAL: IDE v ATB SALES

The issue in Ide

8. On 21 April 2002 Mr Ide, then aged 43, fell from his Marin Rift Zone mountain bike as he rode along a bridleway on the South Downs; he suffered serious head injuries. After the fall the left handlebar was found to have fractured and broken off.

9. Mr Ide had purchased the bike in 1999; it had been manufactured in California by Marin Mountain Bikes and imported into the UK by ATB Sales Ltd (the importers). He brought an action against the importers of the bike (the appellants in this court) under s.2 of the Consumer Protection Act 1987 which imposes upon an importer liability for damage wholly or partly caused by a defect in a product. S. 3 of the Act provides that there is a defect in the product if the safety of the product is not such as persons generally are entitled to expect.

10. There were two competing explanations for the cause of the accident:
    i) Mr Ide claimed that there was a defect in the handlebar because it had insufficient strength to withstand the loads imposed upon it in ordinary use as a mountain bike; it had suddenly fractured and this had caused him to lose control of the bike and fall.
    ii) The importers contended, based on a report of one of the experts they called, Dr Chinn, that Mr Ide lost control of the bike and fell off the bike; the handlebar had then fractured either through being struck by his body or when it hit the ground or by a combination of the two.

11. There was thus a single issue in the case, namely whether Mr Ide could prove that it was more probable than not that he fell from his bike because there was a defect in the handlebar which led to it fracturing. That issue came on for trial before Gray J who by judgment given on 17 July 2007 [2007] EWHC 1667 (QB) held that there was a defect in the handlebar which had led it to fracture and that had caused Mr Ide injury.

12. Permission to appeal was granted by this court on a limited basis. The importer was not permitted to challenge any of the primary findings of fact nor the rejection by the judge of the case put forward by the importers on the basis of Dr Chinn's report that the fracture to the handlebar had been caused by contact with his body or the ground or a combination of the two when he fell off his bike. The argument for the appellant therefore proceeded on the basis that the judge was not, on the primary findings of fact that he had made, entitled to

conclude that Mr Ide had discharged the burden of proving that there was a defect in the bike that had caused his injury and that the judge, after rejecting the theory of Dr Chinn, had impermissibly accepted the case put forward by Mr Ide's expert on the basis that the decision in *The Popi M* had characterised as impermissible.

The primary findings of fact in Ide

13. It is necessary first to summarise the primary findings of fact made by the judge.

i) The bike was well maintained by Mr Ide and regularly serviced; there was no suggestion of misuse or previous damage. He was an experienced off-road biker and dressed safely for such riding.

ii) Although Mr Ide had no recollection of his fall because of post-traumatic amnesia, he was accompanied by two friends on the ride. They had not seen how he came to fall off the bicycle because Mr Ide was in the lead and out of their sight round a bend, but the route was one all had cycled many times before and the conditions that day were ones that were ordinary, both in terms of weather and the terrain. The part of the track where the accident happened was downhill with a gradient of 1:7 and Mr Ide was probably travelling at 18-20 mph.

iii) Both discovered Mr Ide lying motionless with Mr Ide and his bike facing the same way. His special cycling shoes were clipped into the pedals. The left side of the handlebar had broken off.

iv) The handlebar was made from an aluminium alloy to Japanese standard JISD9412. It was 580mm in length and was clamped in the centre to the main frame of the bicycle. Either side of the centre the outer surface of the aluminium tube had been swaged and machined, reducing the outer diameter and the thickness of the tube. The handlebar had been bent during manufacture at a point 85mm from the centre at an angle of approximately 6 degrees.

v) There had been no previous incidents with Marin handlebars.

vi) Tests done by Mr Higgins, an experienced biker with a degree in mechanical engineering, over the bridleway in the South Downs showed that the recorded loading on the handlebar was a maximum force of 32.6kg. Though the accuracy of these tests was disputed by Mr Ide, he was content that the judge could consider the case on the basis that they were accurate.

vii) Two metallurgists gave evidence before the judge, Mr Robert Bachelard was called on behalf of Mr Ide and Mr David Price on behalf of the importers. They agreed on a number of matters:

a) The handlebar had been manufactured in accordance with the relevant standards.

b) The weakest point in the handlebar was at the 85mm point when the handlebar was loaded at the extreme ends.

c) The fracture on the left hand side of the handlebar occurred at the 85mm point. The fracture was a ductile overload fracture; this was evident from the optical microscopy and the scanning electron microscope (SEM) photographs taken. The fracture direction was likely to have been downwards and slightly forwards.

d) The fracture would have been sudden and complete, resulting in the separation of the handlebar. It had occurred as a result of the single application of a load or force that exceeded the strength of the handlebar.

e) There was no evidence that they could see of a pre-existing fracture or crack; Mr Price's initial view that there might have been such a fracture or crack was wrong.

viii) Tests were carried out at Bristol University by the two metallurgists and Dr John Morgan, a senior lecturer in material science at the Department of Mechanical Engineering at Bristol University; Dr Morgan was also called as an expert by Mr Ide. As the left hand side of the handlebar had broken off, it was not possible to test that side. Tests to the right hand side showed that when loading of 110 kg (1100N) was applied, there was an initial bending and then a sudden partial fracture at the 85mm point. The general features of the fracture surface were similar to the fracture that had occurred on the left side; the metallurgists considered that this indicated that the mode of failure was also a ductile overload fracture.

ix) Tests were also carried out on a handlebar from another Marin Rift Zone Mountain bike supplied by the importers; this bent at a maximum force of 130kg (1,300N), but did not fracture; a handlebar provided by another supplier did not bend until a maximum force of 158kg (1,580N) was applied.

x) As the handlebar on the other Marin bike which was tested did not fracture, the two metallurgists were agreed that the handlebar on Mr Ide's bike was of a lower strength and more brittle than the new handlebar of the same design which had been tested. The physical evidence indicated that the handlebar on Mr Ide's bike was likely to have been manufactured in the condition found on testing; slight differences in swaging, machining, heat treatment or material properties could have resulted in the handlebar being of reduced strength.

xi) If the handlebar fractured suddenly during normal riding, it might well have resulted in instantaneous loss of control by the rider.

14. In view of the rejection of Dr Chinn's evidence and the basis upon which the appeal proceeded, it is not necessary to refer to the findings made in respect of his report. It is, however, necessary to set out the evidence of Dr Morgan on which he relied.

i) Dr Morgan's opinion was that the fatigue crack existed at the time of the accident and that the handlebar had snapped in a classic fast fracture fatigue failure. The best evidence for this (as set out in his third report) was that a stain which he had observed on microscopic examination of the failed fracture surface showed that moisture had leaked into a crack. He therefore strongly suspected that the final catastrophic failure occurred

after a fatigue crack had developed in the handlebar. During the three year life of Mr Ide's bike, the handlebar had become progressively weaker as a result of the formation of micro cracks at the bottom of the grooves that had been machined along the handlebar as part of the manufacturing process.

ii) He accepted that one could not know that the cracks were definitely there, as they were not apparent on the SEM photographs, but he adhered to the opinion that there was a smaller minute crack present on the left side of the handlebar. He did not accept the view of Mr Bachelard or Mr Price as to the reason for the failure.

iii) Even though he had reservations as to the accuracy of the measurements carried out by Mr Higgins (as he thought the loads were much greater), he said in cross-examination that even loads of the low magnitude recorded by Mr Higgins along the South Downs bridleway would be sufficient to produce fatigue leading to fracture; the loads could have caused the catastrophic failure which occurred, if the left hand side of the handlebar was weakened.

15. The judge's conclusions, reached after rejecting Dr Chinn's theory, were:

i) Although he rejected Dr Chinn's theory, that did not mean of itself that Mr Ide succeeded. Mr Ide had to satisfy him on the balance of probability that there was a defect in the handlebar and the defect caused him to fall and suffer the injuries.

ii) The fracture of the handlebar had been instantaneous and catastrophic.

iii) Even though the SEM photographs did not reveal any evidence of cracking or fatigue, this did not mean that the fracture was not due to fatigue; Mr Price had found fatigue striation marks and there was evidence of staining; the accident surface damage may have obliterated evidence of cracking.

iv) Fatigue cracking was therefore at least a possible cause of the fracture of the handlebar, but it was not necessary for him to determine the precise mechanism which led to the handlebar fracturing, but whether the evidence supported the conclusion that, as a matter of probability, the handlebar was defective in a way which caused it to fracture. (paragraph 86 of the judgment)

v) He concluded that, on the totality of the evidence, the left handlebar of the bike was defective and it was that defect that had caused the handlebar to fracture with the result that Mr Ide fell from his bicycle:

a) The loading on the handlebar when it was being ridden by Mr Ide along the bridleway was well below the loading required to bend a handlebar, let alone fracture it. The handlebar should have been able to withstand the loading applied even if Mr Ide had struck a stone.

b) The right hand side of the handlebar had been subjected to the testing described at paragraph 13.viii) above. He accepted Dr Morgan's conclusion that the handlebar was weaker and more brittle than it should have been, especially in the light of the fact that the bike was designed for off-road riding. (paragraph 90 of the judgment).

c) Because the left hand side of the handlebar broke at its weakest point, it had not been possible to test that side at that point. The conclusion to be drawn from the tests which had been carried out on the right hand side was that the left hand side of the handlebar was defective:

"The defect may have been an inherent manufacturing defect; alternatively the defect may have resulted from the handlebar degenerating over its two and half year period of use by Mr Ide to the point that it finally fractured during "normal" off-road riding of the bike. As Dr Morgan pointed out in his third report, the magnitude of the forces generated by the normal riding of a mountain bike would have been sufficient to fracture the handlebar in its weakened and defective condition. I accept that conclusion. I accept further that such a sudden fracture would have caused immediate loss of control of the bike. The configuration of Mr Ide and his bike immediately after the accident are consistent with this scenario. I accept that the defective condition of the handlebar and the occurrence of the accident are unlikely to have been purely coincidental." (paragraph 91 of the judgment).

d) It followed, therefore, as a matter of probability, that it was the defect affecting the left hand side of the handlebar which caused it to fracture.

The appellant's argument in Ide

16. It was contended on behalf of the importer that, although the judge had rejected the theory put forward by Dr Chinn, he had expressly found that a fatigue cracking was only a possible cause. Having rejected one theory and found that fatigue cracking was a possible cause, it was wrong for him to have concluded on that basis that Mr Ide had proved that there was a defect in the handlebar which had caused the injury. What the judge had done was to follow a process of reasoning that the House of Lords had said in *The Popi M* was impermissible. The evidence from the metallurgists showed that a load of 110kg was needed to fracture the handlebar; the evidence was that the maximum load applied to the handlebar when being ridden on the bridleway would have been 32 kg. Mr Ide could only succeed if it was probable that there was a pre-existing fracture or crack; the judge had made no such finding. The evidence did not permit it, as the metallurgists were agreed that there was no evidence of such cracking from the microscopy or the SEM photographs. As the finding was only of a possible fatigue fracture, Mr Ide had not established on the balance of probabilities that there was a defect which caused him to lose control and fall. The judge, therefore, after rejecting Dr Chinn's theory should have concluded that there was no cause proved on the balance of probabilities.

My conclusion in Ide

17. I cannot accept the contention made; this was not a ***Popi M*** case and the judge did not in any event use any impermissible train of reasoning. There are two principal bases for my view.

(a) The clear inference was that the handlebar was defective

18. This was a case where there were only two competing explanations before the judge:

    i) Dr Chinn's explanation that the fracture had been caused when Mr Ide fell off the bike and the handlebar had been fractured, either by contact with his body or the ground or a combination of the two.

    ii) Dr Morgan's explanation that there had been a defect in the left hand side of the handlebar. That defect was either the result of manufacturing or fatigue. The handlebar had failed when the normal load was applied to it.

    As the importers contended in their skeleton argument:

    "The single issue was did the handlebar have a defect causing it to fracture prior to Mr Ide losing control of his mountain bike or did it fracture after he lost control and during his fall."

19. This was a case where there were only two possible causes – either Mr Ide lost control and the handlebar fractured as suggested by Dr Chinn or it was defective. No other cause was suggested. Neither was improbable. This was not a case which raised the difficulties identified in *The Popi M*. Moreover as this was a claim under the Consumer Protection Act, it was, in my view, unnecessary to ascertain the cause of the defect. The issue was simply was the fall caused on the basis of Dr Chinn's theory or was there a defect.

20. Dr Chinn's theory was rejected as most unlikely to be right. The judge had found that the bicycle had been regularly maintained and there was no suggestion of misuse or damage; the judge was entitled to infer, as the handlebar had failed in normal use for a bike of this type, that it was defective within the meaning of the Act. This was not a process of reasoning that led the judge to conclude that the defect was the cause because it was the least improbable of the two; once the other cause had been eliminated, all the evidence pointed to a defect in the handlebar. The judge was entitled to conclude that the defect was on the evidence the probable cause of the loss of control of the bike and the fall.

21. It was not necessary for him to go any further than that. Nor did the evidence as to the maximum loading of 32kg make any difference. If the handlebar was weakened either because of a manufacturing fault or fatigue, then it would follow that it could well fracture under that amount of load as Dr Morgan contended. The fact that it needed a load of 110 kg to cause the right hand side of the handlebar to fracture did not mean that a similar load was necessary on the left hand side; as Dr Morgan had said in his evidence and as the judge found, the clear inference was that the left hand side was weaker.

(b) The defect was caused during manufacture or through fatigue

22. It was therefore not strictly necessary for the judge to make a finding as why it had failed. However, the theory put forward by Dr Morgan which I have outlined at paragraph 14 was not improbable and provided a cogent explanation for the defect. Having rejected Dr Chinn's theory as the other possible theory as to why the handlebar broke, the judge was entitled to conclude in the passage from his judgment which I have set out at paragraph 15.v) c) that, as Dr Morgan's explanation for cause of the defect was not improbable, it was therefore the probable cause of the defect that in turn caused the failure. Again the difficulty identified in ***The Popi M*** did not arise on this further enquiry.

23. That explanation of a defect having occurred during manufacture was indeed consistent with the evidence of the metallurgists as set out at paragraph 13.x), though his explanation that it occurred through fatigue failure was not consistent with their evidence.

(c) The judge accepted Dr Morgan's evidence

24. There is a possible further reason why the appeal could not succeed, but I do not wish to rest my decision on that basis. The judge's primary findings of fact were not open to challenge in this court, on the terms on which permission to appeal was given; nor was his rejection of the evidence of Dr Chinn. On analysis of the judgment, it seems clear that the judge, as a matter of primary fact finding, accepted the evidence of Dr Morgan as I have summarised those findings at paragraphs 15.ii) and 15 iii) a) and c) above. As is clear from the terms of the judgment, those were also primary findings of fact which on the terms of the permission to appeal were not open to challenge.

25. It would have been of no significance in those circumstances that the judge also expressed the view in the paragraph summarised at paragraph 15.ii) above that fatigue cracking was at least a possible cause of the failure; it appears that in that passage in his judgment he did not express the view more firmly because he did not consider it necessary to determine what the cause of the defect was. That is apparent from the passage in the judgment I have quoted at paragraph 15(v)(c). However, as a matter of primary finding of fact, the judge in fact went on to conclude on the basis of his acceptance of Dr Morgan's evidence that the handlebar was defective; that primary finding of fact alone would probably have been sufficient for Mr Ide to succeed before the judge and given that finding no appeal could have been successful on the terms of the permission granted. However, as the appellants considered that the terms on which they had obtained permission entitled them to argue the case on the wider issue, the conclusion I have reached is based on that wider issue. I would therefore for the first two reasons I have set out dismiss this appeal.

THE SECOND APPEAL: LEXUS v RUSSELL

26. On 2 February 2004 there was a fire at Mrs Russell's garage in a village near Ashby-de-la-Zouch, Leicestershire; it destroyed her Toyota Lexus RX300 sports utility vehicle (the Lexus), and a Toyota Avensis which were in her garage and two other cars that were parked outside it. The appellants, Toyota Financial Services UK plc (to

whom I shall refer as the manufacturers) demanded from Mrs Russell the sum of £8,269.15 due under the hire purchase agreement under which she had acquired the Lexus some months earlier. Mrs Russell refused to pay on the basis that a defect in the Lexus had caused the fire. The manufacturers commenced proceedings in the County Court; in the defence which Mrs Russell drafted herself she asserted that the cause of the fire was a defect in the Lexus and counterclaimed for the loss and damage caused by the fire.

27. It was common ground that if Mrs Russell could prove that a defect in the Lexus had caused the fire, then the manufacturers were not entitled to the sum sought. The single issue was the same as in Ide - whether Mrs Russell could prove, on a balance of probabilities, that the fire had been caused by a defect in the Lexus.

28. There were, as I shall explain more fully, three possible causes – an arson attack, a defect in the wiring in the garage and a defect in the electrics of the Lexus. Judge Charles Harris QC, after hearing evidence at the Northampton County Court concluded that, on a balance of probabilities, the fire had been caused by a defect in the electrics of the Lexus. Mrs Russell had represented herself at the trial.

29. The manufacturers contended that the judge had reached a wrong conclusion by following the impermissible line of reasoning identified in *The Popi M*. The manufacturers were granted permission to appeal by this court, but also on a restricted basis. The manufacturers were not permitted to challenge the primary findings made by the judge; they were granted permission to appeal on the basis that on those primary findings the judge was wrong to infer that Mrs Russell, on a balance of probability, had proved that the fire was caused by a defect in the Lexus.

The primary findings of fact made by the judge in Russell

30. The findings made by the judge can be summarised as follows:

i) Mrs Russell purchased the Lexus new on 30 October 2003. It was an expensive four wheel drive vehicle produced by a manufacturer with a reputation for good quality. There was no history of the model catching fire spontaneously, although one had done so since in different circumstances.

ii) On 19 January 2004, the Lexus had had its 10,000 mile service. Mrs Russell had, on a few occasions, experienced curious behaviour from the windows and sun roof which several times opened themselves without the operation of the controls; this was reported to the garage but no work seems to have been done to clear the malfunctions.

iii) On 1 February 2004, the day before the fire, the Lexus had not started with its usual felicity and had run with less than normal vigour. After using the Lexus in her business, Mrs Russell had returned home at 6.30 p.m. and parked it in the garage next to the Avensis.

iv) Both cars were parked side by side in the garage with the Lexus on the right hand side looking into the garage.

v) Next to the Lexus on the right hand side of the garage nearest to the up-and-over door was a double socket, a light switch and a fuse box; the fuse box was at about head height and the socket was lower. There was a side pedestrian door opening towards the house on the right hand wall and immediately after the pedestrian door there was on the same wall a transformer for the garden lights at a high level. At the very end of the garage, directly in front of the Lexus was an electrical socket at a low level.

vi) There was a 5 litre fuel can also along the right hand wall next to the Lexus, just underneath the fuse box.

vii) The main garage up and over door was left open that evening. Behind the Lexus and the Avensis another Lexus car was parked as was a Volkswagen Beetle.

viii) Shortly before 1 a.m. a fire in the garage was first noticed by neighbours; it was well established. The fire brigade was called at 00:58.

ix) Mrs Russell and members of her household, including her daughter Katie were then alerted to the fire. Katie's account of what she saw is highly material and was as follows:

"By the time I saw it outside flames were coming over the top of mum's car, not roaring, not trickling. The back of the car was not on fire. I stood there, a yard or more from the back of the car. Flames were coming over my mum's car … I could see flames pouring over the top of mum's car. I could not see them anywhere else. I got down in front of my car. I cannot see how the fire started in the corner where the electrics were. I more or less stood there, just by the tree. I do not think that is where it started. The flames were pouring over the top of the roof, coming up from the front of the car over the top of the roof. I cannot say if they were coming from the sides of the car."

x) Julie Chamberlain, who also lived at Mrs Russell's house, described the Avensis as being hardly on fire but seeing flames coming from the windows of the Lexus; the flames were from window height upwards, as if the Lexus was on fire before the Avensis.

xi) The judge found, on the basis of those accounts, that the Lexus was on fire before the Avensis, as the witnesses had not described flames on the floor or at the back of the Lexus. He also accepted the evidence that the roof of the garage was at that stage of the fire still in place and not on fire.

xii) The fire was brought under control by 2:30 am; it had done great damage to the Lexus and Avensis and much of the garage; the two cars outside the garage were also damaged.

31. Two fire experts gave evidence:

i) The manufacturers called Dr Wareham, an associate of Hawkins & Associates Ltd; although a geologist and geochemist by qualification, he had extensive investigative experience of fires. He investigated the scene of the fire and concluded that it was not possible to say what had caused the fire:

a) The fire started inside the garage; that was not disputed.

b) The damage to the Lexus was so severe that it was impossible to examine the wiring and electrical components to ascertain if they had been the cause of the fire.

c) A similar conclusion had to be drawn in respect of the wiring and components in the garage.

ii) Mrs Russell called Mr Jenkins, a forensic scientist of many years experience who had very considerable experience in examining fires. He was not instructed until after the Lexus had been taken away and destroyed.

32. Prior to the commencement of the trial, two further possible theories as to the cause of the fire were being advanced – a fault with the Avensis and the accidental action of an intruder. The judge found as a fact that a fault in the Avensis did not start the fire as it caught fire second and the possibility of an accidental fire being caused by an intruder was not pursued. There were, therefore, three possibilities that were examined by the judge.

Arson

33. The judge found there was no evidence to suggest an arson attack; the house was small, in a quiet cul-de-sac, in a quiet rural village with no history of crime or vandalism. It had been a cold winter's night and there had been snow. No arsonist was seen. No arsonist's equipment or materials were found. There was no suggestion of motive or culprit. Neither the fire brigade nor the police had suggested arson. He rejected arson as an explanation, concluding there was no reason to consider this, even as a reasonable possibility.

The judge's approach to the other suggested causes

34. Having rejected arson, he then turned to consider the evidence in respect of the electrical fittings in the garage and the Lexus. In doing so, he stated:

"Neither would normally be regarded as likely spontaneously to ignite in the sense that such would not be a common occurrence but it was recognised that occasionally both domestic wiring and cars may catch fire as a result of some fault."

35. He then turned to examine in turn the evidence in relation to the electrical wiring and units in the garage and the electrics in the Lexus.

The electrical wiring and units in the garage

36. The judge first considered whether the socket at the far end of the garage could have caused the fire. He made three findings.

i) It was not in use and not turned on.

ii) Although Mrs Russell apparently parked the Lexus by touch and had placed carpet as a fender to cushion contact between the front of the Lexus and the garage wall, there was no reason to conclude that she ever bumped the Lexus into the socket. Its cabling ran internally in the cavity of a brick wall.

iii) The area of least severe fire damage in the Lexus was that at the front and front nearside, nearest to this socket.

37. The judge next considered the electrics by the side door and the main door. Both experts agreed it was possible that a fault might manifest itself in the transformer, fuse box or wiring; if there was a short and if the trip or fuse arrangements did not operate (which they might not) then this could result in a heat build-up which might ignite the cable. This could have provided a source of ignition which was not from the Lexus. No melting damage was in fact found to the wiring, but that was not significant as there could have been such damage which was obscured or destroyed by the fire.

38. The source of ignition from the wiring would only have been small and affected the wiring or unit; these were three feet from the Lexus and could not, therefore, have set it alight directly. Nor could the Lexus have been set alight by a fire in the wiring affecting the roof of the garage as the roof would have caught fire prior to the Lexus, which was not the case, on the factual evidence to which I have referred at paragraph 30.xi). There were two other possibilities:

i) A burning piece of wire or of an electrical unit could have fallen from the wall onto the concrete floor of the garage, but unless something burning happened to fall against the offside rear tyre of the Lexus and burned for long enough, it was hard to conclude that even if a component was on the floor there would have been any significant prospect of it igniting the Lexus.

ii) A burning piece of wiring could have fallen near the 5 litre container of petrol; that was made of plastic and if it had burned for long enough and with enough heat then it might have melted or lit the can and thus ignited the petrol. That would have been consistent with the severity of the damage to the offside of the Lexus.

A defect in the Lexus' electrical components or wiring.

39. The judge next considered the Lexus. It had been parked for about 6½ hours before the fire started; frictional heating of components (such as brakes or bearings) could be ruled out. So could flammable liquids such as oil or petrol falling onto hot components. The catalytic converter showed no sign of damage.

40. The judge accepted Dr Wareham's conclusion, with which Mr Jenkins agreed, that the only mechanism by which the Lexus could have caught fire accidentally would have been due to a fault with its wiring or energised electrical components served by the wiring. This could have happened by a short circuit resulting from a positive cable touching a component bonded electrically to the chassis through chafing of the cable. Although electrical faults were most likely to start a fire when a car was started or driven, parked and locked vehicles could still catch fire because of electrical faults; this could happen if a control component developed an internal incendive fault during or after engine systems shutdown. The judge concluded that whilst some of the circuits on the Lexus were dormant, some were clearly live.

The judge's conclusion

41. The judge then posed himself the question, given that electrical faults setting buildings and cars alight were both uncommon, but such things did happen, was there sufficient material for him to conclude on the balance of probabilities that it was more likely that the Lexus set itself alight than that the garage wiring caused the fire? He then set out a number of reasons for his conclusion that, on a balance of probabilities, the cause of the fire was an internal electrical fault in the Lexus rather than a fault in the wiring or electrical units of the garage.

i) The Lexus contained a complex and extensive electrical system; there was obviously much more to go wrong in the Lexus than in the simple sockets, wiring and lights of the garage.

ii) The Lexus' electrical components were in close proximity to flammable items, particularly plastics of various kinds.

iii) The garage electrical wiring and units were at some distance from the Lexus and were attached to bare, non-flammable brick walls. For faults in the wiring or electrical units on the garage wall to ignite the Lexus, the following sequence of events would have been necessary:

a) A fault developed in the wiring or component.

b) The fuse failed to activate.

c) There was sufficient heat to ignite the cable or the fuse box or the transformer.

d) A burning piece of component or wiring fell.

e) The piece fell in close proximity to the petrol can or the offside rear tyre of the Lexus.

f) The piece continued to burn long enough and at a hot enough temperature to light the tyre or melt the fuel can.

As the garage roof caught fire after rather than before the Lexus, the roof was unlikely to be the mechanism by which a fire in the wiring or electrical unit had transferred to the Lexus.

iv) There was some evidence, to which I have referred at paragraph 30.ii) above, about faults in the Lexus' electrical systems which caused the windows and sun roof to open.

v) The eye witness evidence, especially that of Katie Russell, was very important. She had not seen the back of the Lexus on fire which would have been present if it had been lit by falling external electrical components igniting the offside rear tyre or the can of petrol in the vicinity. Mrs Chamberlain had described seeing flames in the Lexus from the window upwards but none on the floor. She did not see the tyre burning.

The argument advanced by the manufacturers on the appeal in Russell

42. It was the primary contention of the manufacturers that all of the suggested causes were improbable. The judge had no reason to rule arson out – it was a possible cause, but improbable. As to the cause being the defect in the garage wiring and electrical units or the defect in the electrics of the Lexus, the judge had in reality found that both were improbable causes. This was therefore a case where the two causes that the judge had considered were both improbable and the third which he had ruled out was one that should also have been treated as improbable. The evidence of Dr Wareham and of Mr Jenkins had on analysis made it inevitable that the only clear conclusion was that each of the causes suggested were improbable:

i) There was other evidence given by Dr Wareham, to which the judge had not given sufficient weight, that underlined the improbability that the fire had originated in the electrics of the Lexus:

a) Although a chafed wire would provide a mechanism by which a fire could be started, an examination by Dr Wareham of a similar model had shown, although not all of the wiring could be examined, that there were no areas where cables could plausibly chafe against the steel of the body work. That was because a high degree of care and skill had been used in design of the Lexus.

b) There was nothing to suggest that the problems Mrs Russell had reported in relation to windows and sun roof opening of their own accord could result in a fire, as when the electrics were switched off these components were not energised.

c) If the eyewitness evidence pointed to the fire beginning at the front right side of the Lexus, the ABS control unit was the only electrical unit in that area and it showed no sign of a fault.

d) The physical evidence suggested that the fire did not start in the engine compartment where several electrical components were located as these were less damaged there than elsewhere.

e) The pattern of fire damage was consistent with the fire having started outside the Lexus at the rear right. This was the area where access to the garage would have been obtained by an intruder and was next to the fuel can and the main part of the electrics of the garage; the evidence of Mrs Russell was that there were rags in a bucket in the garage.

f) It was not that surprising that there was no positive evidence of an intruder or a fault with the garage's electrical circuitry given the intensity of the fire.

g) The electrical circuit in the garage was live as the sensor for the lights was switched on.

h) The judge should have appreciated that the complexity of the Lexus' wiring system was counter balanced by careful design; the fact that some of the electrical components were in close proximity to the flammable items did not mean that they caused the fire.

ii) Although Mr Jenkins had given evidence that his views were similar to those of Dr Wareham, he had reached the view that the cause of the fire was a fault in the Lexus on the basis that, by eliminating everything else, such a fault was the most likely cause; that was not a permissible line of reasoning. Furthermore, he had not examined the Lexus or the garage; he was unable to point to any particular mechanism by which the fire could have started in the Lexus. Little weight should in any event have been attached to his conclusion. He had moreover accepted that cars were designed so that any circuits that were live when a car was parked were placed where they were likely to do the least damage; he could not exclude a fire caused by an intruder nor in the electrical circuitry. Indeed he had explained how a fire could have started in the circuitry, moving to the plastic components near the door (such as the fuse box), loosed the fastenings on the wall which would then have dropped onto the floor and set fire to something lower down.

43. On the facts, therefore, the judge could not, by inference, properly have reached the conclusion that, on a balance of probabilities, Mrs Russell had shown that the fire was caused by a defect in the Lexus' electrics. There were two mistakes the judge had made. First, the judge had followed the reasoning which had been characterised in ***The Popi M*** as impermissible; what the judge had done was to follow the reasoning put forward by Mr Jenkins and conclude that the fire had been caused by the least improbable of three improbable causes. That did not entitle him to conclude that the fire had been caused on a balance of probabilities by the electrics of the Lexus. Second, it was not a case where the competing causes could be ranked so that the most probable could logically be determined as the cause; that was because it was impossible to say that any of the causes was more probable than the others.

My conclusion on Russell

44. I cannot accept the contentions advanced. First of all it seems to me that the judge was correct in concluding that arson was "unlikely in the extreme". Given the factors set out by the judge, that was an inference that was open to him to make and he was entitled to eliminate this as a cause.

45. Secondly, the judge was then left with the issue as to whether the cause had been the wiring or units in the garage or the electrics in the Lexus. No other alternative was put forward. Although both of these causes were uncommon, both could have been a cause; neither was improbable. The findings made by the judge simply do not support the contention advanced by the manufacturers that either of these causes was improbable. This was therefore not a *Popi M* case. It was therefore necessary to analyse as between the two which was the stronger probability.

46. The analysis carried out by the judge cannot be faulted. The really significant factor was, in my view, the sequence of events that would have had to occur and follow on one from the other for a fault in the wiring or electrical units of the garage to have caused the fire in the Lexus. Secondly, his analysis was supported by the eye witness accounts of Katie Russell and Julie Chamberlain. Their description of the fire was of a fire that could not have originated as a result of a fault in the wiring or electrics of the garage; if that had been the cause, the fire would have been at the rear of the cars, but they did not see a fire there. Thirdly, their account was entirely consistent with the fire having developed within the Lexus. Fourth the very severe fire damage in the rear offside wheel was explicable by intense heat having been caused by fuel leaking from the vehicle's fuel tank and the plastic 5 litre can of petrol; it was not only explicable by the fire having started there. The judge did not accept the other evidence given by Dr Wareham and the manufacturers cannot go behind his findings or seek further findings in this court on the basis of the limited permission given.

47. For those reasons, therefore, I cannot accept that the judge in this case followed the impermissible approach which Lord Brandon of Oakbrook identified in ***The Popi M***. The judge did not fall into the trap of eliminating the other causes and reaching the conclusion that the least unlikely cause was the cause of the fire. He did not reach a conclusion that the electrics of the Lexus was the least unlikely cause of the fire. His analysis was one which was in accordance with the way such a case should be approached, as I have endeavoured to state at the outset of this judgment. He was considering a case where the competing causes were not improbable. His reasoning, supported as it was by the eye witness accounts and the evidence of the fire damage, led him to the correct conclusion that the probable cause of the fire was a defect in the electrics of the Lexus.

48. For these reasons, I therefore would dismiss this appeal.

Lord Justice Dyson:

49. I agree.

Lord Justice Ward

50. I also agree.

Mr Neil Block QC and Bernard Doherty (instructed by Greenwoods) for the Appellant (ATB Sales)
Mr Richard Lynagh QC and Thomas Saunt (instructed by AWB Partnership) for the Respondent (Ide)
Mr Neil Block QC and Bernard Doherty (instructed by Beachcroft) for the Appellant (Toyota)
Mr Neil Hext (instructed by Edwin Coe) for the Respondent (Russell)