

# Using Statistical Evidence in Courts: A Case Study

## Or

### What Went Wrong in the Case of Sally Clark?

#### **§1 Introduction**

The debate about the usage of statistical evidence in criminal courts has a long history.<sup>1</sup> Whilst the case of Sally Clark raises various issues,<sup>2</sup> much of the public and scholarly attention given to it was focused upon the usage of statistical evidence in this case. Each of Sally Clark's two baby boys, Christopher and Harry, was found dead on separate occasions. Christopher's death was at first treated as SIDS ("cot death"). However, when Harry died, the autopsy revealed unexplained injuries and the findings from Christopher's autopsy were re-evaluated. Sally was then charged with and convicted of the murder of both babies.<sup>3</sup> In the trial, the prosecution called Professor Sir Roy Meadow, an expert paediatrician, to dispute the potential defence claim that both deaths were from SIDS. In his testimony, he said that the chance of two cot deaths in one family is 1 per 73 million. This calculation was found to be flawed but the Court of Appeal held the conviction after finding that the case against Sally Clark was still 'overwhelming'.<sup>4</sup> However, a few years later, her husband found in the hospital archives microbiological results suggesting that Harry died from natural cause (henceforth "the missing evidence"). A second appeal was allowed and Sally Clark was set free after serving more than three years in prison.<sup>5</sup>

This paper inquires if and how the miscarriage of justice could have been avoided. In particular, it questions whether the decision of the first appeal court to uphold the convictions was erroneous, and if so why (henceforth "the research question"). First, the paper rejects the idea that the decision of the first appeal to uphold the convictions was correct, or at least understandable, when the unavailability

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<sup>1</sup> For instance, at the end of the 19<sup>th</sup> century in France, Alfred Dreyfus was convicted of treason after statistical evidence was used creatively to prove his identity as the author documents which were leaked to the Germans. A full description of this case can be found in LH Tribe, 'Trial by Mathematics: Precision and Ritual in the Legal Process' Harvard Law Review 1329, pp. 1332-1334.

<sup>2</sup> For example, the duties of expert witnesses receive repeated scholarly attention, see, for instance, A Wilson, 'Expert Testimony in the Dock' [2005] 69 (4) J Crim L 330; D Dywer, 'The Duties of Expert Witnesses of Fact and Opinion: *R v Clark (Sally)* (Case Note)' 7 International Evidence and Proof 264; L Blom-Cooper, 'Disciplining Expert Witnesses by Regulatory Bodies' [2006] (Spr) Public Law 3.

<sup>3</sup> *R v Clark*, Crown Court, 9.11.1999.

<sup>4</sup> *R v Clark (No 1)* [2000] EWCA Crim 54, [238], henceforth *Clark-I*.

<sup>5</sup> *R v Clark (No 2)* [2003] EWCA Crim 1020, henceforth *Clark-II*.

of the missing evidence is taken into account. Such an assertion seems to be implied from the explanation provided by the second appeal when quashing the conviction (*Clark-II*, [179]). Contrary to this implied assertion, this paper seeks to show that the decision of the first appeal court to uphold the conviction was erroneous even *given the evidence available at the time* (henceforth, “the erroneous decision”, and see §2 for an elaboration of this term).

The paper then turns to examine possible explanations for this erroneous decision. It starts with some of most widespread explanations, all hinge on the statistical evidence in one way or another. The first explanation is that the mistaken conviction resulted from the flaws in Professor Meadow’s statistical analysis. The second explanation is that the mistaken conviction resulted from the legal failure to use Bayes’ Theorem.<sup>6</sup> The third explanation is that the statistical evidence had an overwhelming psychological effect which shadowed other evidence which was more favourable to Sally. By rejecting these three explanations, it is argued that the role of statistical evidence in this case is much overrated and the cause of this miscarriage of justice has to lie somewhere else.

The paper then seeks to suggest an alternative answer. It is suggested that the conviction should be attributed mainly to the lack of alternative innocent explanations for the babies’ deaths. This conceived lack of alternative explanations might have resulted from a misinterpretation of the definition of SIDS. If this answer is true, it indicates that the presumption of innocence and the requirement for proof beyond reasonable doubt were taken much less seriously than they should have. The case of Sally Clark provides a general warning about the importance of these procedural mechanisms. It also evokes concrete concerns about the way that the proof of complex elements such as causation and intention is done in practice. Last, it suggests that questions about the usage of statistical evidence in courts, interesting as they may be, should not overshadow other important questions. The real challenge for the legal fact-finding is to return to the basic concepts of the law of evidence, such as the standards of proof and the presumption of innocence, and to investigate their theoretical meaning and practical implementation.

The structure of the paper is as follows. Section 2 lays the methodology of this research. Section 3 presents the facts of the case, together with the prosecution

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<sup>6</sup> Bayes’ Theorem, which is discussed in more detail below (§5.2), is a mathematical formula which guides an agent how to rationally revise her beliefs in light of new evidence.

and the defence lines. Section 4 argues that the decision of first appeal was erroneous even given the evidence available at the time. Section 5 rejects the existing explanations around the statistical evidence. Last, section 6 proposes an alternative explanation and discusses its implications.

## **§2 Methodology**

The method used in this paper requires some clarification. The first subsection explains and justifies two respects in which the research question of this paper is narrowed. The second subsection highlights an important presupposition that is assumed to be true. The last subsection lists some methodological caveats.

### **§2.1 Narrowing the Research Question**

Based on the knowledge we have today, it might be tempting to jump to the conclusion that Sally's innocence was obvious throughout the proceedings. There is also a risk of using *ex post facto* wisdom to criticise the involved judges, lawyers or the administration of justice as a whole.<sup>7</sup> In an attempt to limit that risk, the research question of this paper is narrowed in two respects.

First, the paper focuses mainly on the death of Christopher. The main justification for this limitation is that the missing evidence which its discovery led to the quashing of convictions was relevant only to Harry. Sally Clark was charged with and convicted of two separate indictments, so the prosecution was required to prove each of them *separately*.<sup>8</sup> There is one exception to this, as the similarities between the cases served as evidence for the prosecution, and this evidence is discussed below (§4.2.3). The paper therefore refers to Harry's case when needed, but only as subsidiary evidence to Christopher's case. However, the medical and pathological evidence with regards to Christopher's death remained unchanged between the two appeals. Hence, focusing on Christopher provides an event about which the evidence remained more or less the same between the two appeals.

The second respect in which the research question is narrowed is that rather than focusing on the actual trial, the paper focuses mainly on the decision of the first

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<sup>7</sup> For some complaints against the legal representatives in this case, see Wilson, *supra* 2, pp. 342-345.

<sup>8</sup> However, the defence's application to hold two separate trials was rejected, *Clark-I*, [81]. The trial judge's decision was reaffirmed by the first appeal, finding that 'the judge's ruling on severance was legally impeccable', *Clark-I*, [92].

appeal to uphold the convictions. There are various reasons for this choice. First, whilst the jury in the actual trial did not provide any detailed account of its reasoning,<sup>9</sup> the decision of the first appeal contains immense detail about the judges' reasons to uphold the conviction. Second, trained and experienced judges are less vulnerable to counsel's trial tactics, logical fallacies, etc than lay juries who participate in a trial setting for the first time in their life. Hence, focusing on the first appeal makes the research question more interesting and focused because it reduces the importance of factors which are external to the evidence and to the legal reasoning (e.g. rhetorical ability of counsels, etc.). Last, and most importantly, focusing on the decision of the first appeal shows that the conviction was upheld *despite* the immense attention to detail and argument. It is the thoroughness of the treatment of the administration of justice of this case which makes it so troubling. The decision of the first appeal is impressive in its level of analysis and attention to detail. Just as a way of illustration, this decision consists of over 35,000 words of detailed description of the facts, the witness testimonies, the arguments of the parties, together with the reasoning of the judges. However, if one accepts that the convictions should not have upheld even given the evidence available at the time (as it is argued in detailed below, §4), then the following troubling question arises. If such detailed attention was given to so many details, why did the first appeal nevertheless uphold these convictions? This is the question which this paper investigates.

## **§2.2 The Central Presupposition of Erroneous Decision**

The term "erroneous decision" is used throughout this paper and it is therefore important to clarify what is presupposed by this term. This term in particular, and the question of "what went wrong in the case of Sally Clark" in general, implies the following presupposition:

If the evidence available today was also available at the time of the first appeal, the court should not have upheld Sally Clark's convictions (henceforth, "the central presupposition").

This presupposition is accepted explicitly by the judges of the second appeal:

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<sup>9</sup> In general, the jury is not required to provide reasoning for its 'guilty' or 'no guilty' judgment, P Roberts and AAS Zuckerman, *Criminal evidence* (Oxford University Press, Oxford 2004), pp. 59-61.

We are quite satisfied that if the evidence in its entirety, as it is now known, had been known to the Court it would never have concluded that the evidence pointed overwhelmingly to guilt. (*Clark-II*, [179])

By endorsing this central presupposition, this paper assumes that the second appeal was correct to quash the convictions given the evidence available today. However, it is important to distinguish this central presupposition from other propositions which are *not* presupposed by the term “erroneous decision”. First, “erroneous decision” does not *presuppose* that the court was erroneous to uphold the conviction *given the evidence available at the time*. Rather, this paper seeks to establish this claim (see §4 below) rather than merely presuppose it.

Second, the central presupposition does not require one to accept that ‘Sally Clark is innocent’ or that ‘Christopher and Harry died from natural cause’. Both of these claims are not required for the purpose of this investigation because of the context of inquiry. The question of this paper is set in the context of criminal proceedings. Historians may be interested in the question whether the accused committed the crime or not.<sup>10</sup> They may be interested whether the proposition ‘Sally Clark killed Christopher and Harry’ is true or false.<sup>11</sup> However, the legal question is rather different. The question is whether this proposition about the killing was proved beyond reasonable doubt according to the rules of criminal evidence. These two questions differ in many important respects, out of which two require emphasis for the purpose of this investigation.<sup>12</sup> First, the legal fact-finder in the criminal trial is committed to a higher standard of proof.<sup>13</sup> For example, a legal fact-finder might reach the conclusion that although it is very likely that ‘Sally Clark killed Christopher and Harry’, the defence was able to establish one or more reasonable doubts in this proposition. In that case, the legal fact-finder is required to acquit. The historian, in

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<sup>10</sup> The reference to ‘historians’ is mainly to those historians are not persuaded by post modernism, i.e. those who accept that propositions about the past can have truth values, and that knowledge of the past is not always impossible. I thank Giora Sternberg for drawing my attention to the assumptions made in the text above when referring to ‘historians’.

<sup>11</sup> ‘Kill’ is used rather than ‘murder’ because the latter involves legal questions (e.g. whether the agent has intention to kill or to cause grievous harm) rather than the mere factual question whether the victim was killed by the agent. For murder in general, see R Card, *Card, Cross & Jones, Criminal Law* (16th edn, LexisNexis Butterworths, 2004), §7.1-§7.23, pp. 240-256; D Ormerod, *Smith & Hogan* (11th edn, OUP, Oxford 2005), ch. 13, pp. 429-441.

<sup>12</sup> The difference between the legal and the historian standpoints is exemplified in a joint paper between William Twining, evidence law scholar, and René Weis, historian, about their different perspectives of the case of Edith Thomson, W Twining and R Weis, ‘Reconstructing the Truth about Edith Thomson: The Shakespearean and the Jurist’ in W Twining (ed) *Rethinking Evidence: Exploratory Essays* (CUP, Cambridge 2006).

<sup>13</sup> Roberts and Zuckerman, *supra* 9, ch. 8 in general and pp. 344-348 in particular.

contrast, may still reach to the conclusion that the proposition is true even though s/he might be expected to acknowledge the facts that might counter this conclusion. The second difference is that the historian may use every piece of relevant evidence that is available to him. In contrast, the legal fact-finder is constrained by the rules of evidence, which may render inadmissible some types of *relevant* information (e.g. hearsay).<sup>14</sup> The presupposition in this paper relates only to the legal question of whether the murder of Christopher and Harry by Sally Clark was proven beyond reasonable doubt according to the rules of evidence. Therefore, it is sufficient to presuppose that the convictions should not have been upheld given the evidence available today. The stronger assumption that she is actually innocent is not required for the purpose of this investigation and is therefore not implied by the term “erroneous decision”.

### **§2.3 Methodological Caveats**

There are two methodological caveats that should be acknowledged. First, the research question of this paper inevitably requires consideration of hypothetical counterfactual scenario. For example, if the statistical evidence had been rendered inadmissible from the outset, would Sally Clark have been acquitted? Surely, such questions can never be answered with certainty. No experiment can be conducted and no evidence could be brought to prove a counterfactual scenario (as this scenario has never happened). Yet, such questions are asked on a regular basis by courts when evaluating and judging individuals’ behaviour (e.g. if the negligent doctor had acted lawfully, would the patient’s harm have been avoided?). Following this legal practice, it is assumed here that whilst referring to counterfactual scenarios has limitations, it is nevertheless a legitimate method of investigation.

Second, during this investigation, one should always bear in mind another possibility: perhaps given the practical constraints of the administration of justice, the erroneous decision was unavoidable. In general, it has long been acknowledged that courts can never ascertain facts with absolute certainty.<sup>15</sup> This may be attributed to

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<sup>14</sup> For the emphasis that evidential exclusionary rules applies only on relevant evidence, see Roberts and Zuckerman, *supra* 9, pp. 96-98. For the rule against hearsay, see *ibid*, ch. 12.

<sup>15</sup> Roberts and Zuckerman, *supra* 9, p. 368. A Stein, *Foundations of Evidence Law* (Oxford University Press, Oxford 2005), p. 56. W Twining, 'Some Scepticism about Some Scepticisms' in W Twining (ed) *Rethinking Evidence: Exploratory Essays* (CUP, Cambridge 2006). It is beyond my understanding

two types of constraints. The first is epistemic: the administration of justice operates in reality where required evidence is not always available and scientific knowledge is not always complete. The second not-less-important type is the administrative constraints: the legal fact-finding is limited in both time and resources. As much as the administration of justice would aspire to minimise errors, some errors are nevertheless inevitable not only due to lack of evidence and/or knowledge, but also because time and resources are always limited.<sup>16</sup> This paper rejects the idea that the erroneous decision was understandable given the evidence available at the time (i.e. epistemic constraints, see §4 below). However, it leaves open the possibility that the erroneous decision is unavoidable given the administrative constraints in which the administration of justice operates. Therefore, if none of the answers (including the one suggested in this paper, §6) is really convincing, another possibility which should not be ignored is that perhaps the erroneous decision might have been unavoidable given the administrative constraints in which the administration of justice operates.

### **§3 Facts & Allegations**

Since the research question of this paper focuses on the decision of the first appeal (see §2.1 above), it is important to remain as close as possible to the standpoint of the judges of the first appeal. To accomplish that, the factual background and the cases of each party are cited from the decision itself, with some omissions to make these long sections more readable.

#### **§3.1 Factual Background**

The decision of the first appeal to uphold Sally's conviction is opened with the following description of the facts:<sup>17</sup>

2. The appellant, who is 35 years old, is a solicitor of previous good character...[Her] first child, Christopher, was...an apparently healthy baby but died...while the appellant's husband was out at an office party...The post mortem was carried out by Dr Williams, who found inter alia bruises and abraded bruises on the body and a small split and slight bruise in the

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why after making this concession, some of these authors nevertheless consider their position as anti-sceptical.

<sup>16</sup> The importance of explicitly recognising the role of administrative constraints is nicely demonstrated through Roberts and Zuckerman's justified objection to Wigmore's concept of "legal relevance", Roberts and Zuckerman, *supra* 9, pp. 100-108.

<sup>17</sup> *R v Clark (No 1)* [2000] EWCA Crim 54, [2-3].

frenulum, which he thought at the time were probably consistent with resuscitation attempts. At the time the cause of death was considered to have been lower respiratory tract infection and it was treated as a case of Sudden Infant Death Syndrome (SIDS or "cot death"). The body was cremated, but photographs had been taken and slides of the lungs were preserved.

3. The couple's second child, Harry, was born...healthy...Harry died on 26 January 1998. The appellant's husband was at home but the appellant was alone when she discovered Harry's condition...Dr Williams's findings at post mortem were indicative of non-accidental injury, consistent with shaking on several occasions over several days, and it was considered that shaking was the likely cause of death. In the light of this, further tests were carried out in relation to Christopher and Dr Williams altered his opinion, concluding that Christopher's death had also been unnatural and that the evidence was suggestive of smothering.

### **§3.2 Prosecution's Case**

The court describes the prosecution case as follows:<sup>18</sup>

6. It was the prosecution case at trial that the appellant had murdered Christopher by smothering...It was alleged that neither death could be considered SIDS because of the existence of recent and old injuries that had been found in each case, and there was no sufficient evidence as to how they had been caused. The circumstances of both deaths shared similarities which would make it an affront to common sense to conclude that either death was natural, and it was beyond coincidence for history to so repeat itself. In summary, six main similarities were relied upon: (1) the babies were about the same age at the time of death, namely 11 weeks and 8 weeks; (2) they were each found by the appellant unconscious in the same room; (3) both were found at about the same time, shortly after having been fed; (4) the appellant had been alone with each child when he was discovered lifeless; (5) in each case Mr Clark was either away or about to go away; (6) in each case, according to the prosecution, there was evidence of previous abuse and of deliberate injury recently inflicted.

7. ... In relation to Christopher the prosecution relied on:

a) bleeding in the lungs: Christopher had had a nosebleed while at the Strand Palace Hotel on 3-4 December 1996, which the prosecution alleged to be consistent with a prior attempted smothering; one of the defence experts. A spontaneous nosebleed in a child of this age would be extremely rare, and for so much blood to have got into the lungs of the child would have required urgent hospital treatment, which was not the case as the child recovered spontaneously. On the other hand, old bleeding in the lungs is a marker (although no more than that) for asphyxia.

b) the torn frenulum: this was said to be diagnostic of deliberately inflicted injury and unlikely to have resulted from resuscitation efforts; the prosecution alleged that it suggested abuse shortly before death, consistent with smothering;

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<sup>18</sup> *ibid*, [6-7]. The lengthy sections relates to Harry are omitted.

c) the bruises which had been seen by Dr Williams, an experienced pathologist, who was in no doubt about them.

### **§3.3 Defence's Case**

The court describes the defence case as follows:<sup>19</sup>

10. The defence case was that the appellant did not kill her children or do anything untoward, and that they must have died of natural causes. It was accepted that there were worrying and unusual features, but submitted that the evidence amounted to no more than suspicion. The defence contended that Professor Green and Dr Keeling, two of the Crown's pathologists, gave the cause of death in both cases as unascertained and that the case hinged on the reliability of Dr Williams, the pathologist who carried out the post mortems.

11. In relation to Christopher, Dr Williams' ...interpretation of marks, not seen at the hospital and not examined under a microscope, was alleged to be unreliable. Whilst the injured frenulum was suspicious, it was suggested that it could have been caused during insertion of the laryngoscope. The fresh blood in the lungs was only a marker for smothering and was often found in both suspicious and cot death cases. In respect of the old blood, there was no doubt that the nosebleed did occur; the appellant was unlikely to have attempted to smother Christopher on the day she had brought him to London to show to her friends.

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14. In relation to the statistical evidence the defence relied on CONI figures (as opposed to the CESDI figures relied on by the prosecution) and Professor Berry's evidence that the risks were inherently greater in a family that had already had a SIDS death.

## **§4 An Understandable Error?**

### **§4.1 The Second Appeal's Reflections on the First Appeal**

The best place to start seems to be the reflections of the second appeal on the decision of the first appeal. In the decision of the second appeal, Kay LJ explicitly reflects on the decision of the previous Court of Appeal:

In reaching that conclusion [that the evidence against Sally Clark was overwhelming] the Court was as misled by the absence of the evidence of the microbiological results as were the jury before it. We are quite satisfied that *if the evidence in its entirety, as it is now known, had been known to the Court it would never have concluded that the evidence pointed overwhelmingly to guilt.*<sup>20</sup>

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<sup>19</sup> *ibid*, [10-11, 13-14]. Again, the sections relates to Harry are omitted.

<sup>20</sup> *R v Clark (No 2)* [2003] EWCA Crim 1020, [179]. The court then refers to the statistical evidence as another possible reason, and this is discussed separately in §5 below.

Two important points can be extracted from this reflection. First, this reflection offers a clear answer to the question of “what went wrong in the case of Sally Clark”. According to the second appeal, the answer is that the erroneous decision was caused by Dr Williams’ failure to disclose the crucial evidence. After Sally’s conviction was upheld by the first appeal, her husband, Stephen Clark, found evidence in the hospital archives of microbiological results suggesting that Harry died from natural cause. This crucial evidence was known to Dr Williams (*Clark-II*, [138]), but he ‘made no reference to these results nor even to having submitted these samples for examination in any of the three statements he made for the trial’ (*Clark-II*, [142]). The second appeal notes that ‘his failure demonstrated that he had fallen a very long way short of standards to be expected of someone in his position upon whose evidence the court was inevitably going to be so dependent.’<sup>21</sup> This reflection therefore serves also as an answer to the question of “what went wrong”.

Second and more importantly, this reflection seems to implicitly reject the idea that the convictions and the decision to uphold them were erroneous *given the information available at the time*. To some extent, this reflection suggests that the administration of justice could not and should not be held responsible for this erroneous decision, because it was denied some crucial information.<sup>22</sup> Given the information that the courts had at the time, the truth could not have been ascertained because both the jury and the first appeal were misled by a medical expert. The second appeal also carefully remarks that the Counsels of both parties were unaware of this missing evidence (*Clark-II*, [154]). This remark might have been made to reject claims about misconduct or negligence of the legal representatives. This remark also seems to imply that the legal representatives should not be held responsible for the erroneous decision.<sup>23</sup> It should be remembered that the case of Sally Clark has received intensive public attention.<sup>24</sup> However, it was noted that the media followed the court in focusing on the missing evidence and avoid from

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<sup>21</sup> *ibid*, [164]. This was the court’s provisional view which was accepted after Dr Williams refused to appear in court to explain his behaviour [165]. Dr Williams was later struck out of the list of Home Office accredited pathologists, C Dyer, 'Sally Clark pathologist removed from Home Office list' 331 (7529) *BMJ* 1355.

<sup>22</sup> The decision is presupposed to be erroneous only in the sense that *given the evidence available today*, the decision to uphold the convictions is erroneous. Whether it was erroneous given the evidence available at the time is the question which this section discusses.

<sup>23</sup> For a different view, see Wilson, *supra* 2, pp. 342-345.

<sup>24</sup> This can be illustrated through the intensive media coverage of this case, a summary of which may be found in Sally Clark’s website, <http://www.sallyclark.org.uk/Media.html>. The intensive media was also acknowledged by the second appeal, (*Clark-II*, [5] and [171]).

questioning the trial and the appeal processes.<sup>25</sup> Whilst the second appeal does not directly address the question of whether the erroneous decision was avoidable even given the information available at the time, these remarks seem to suggest that the court is unconvinced that given the information available at the time, the legal result should have been different.<sup>26</sup> Therefore, the missing evidence explanation may be used both to provide an answer to the “what went wrong” question and to hint that the erroneous decision was understandable given the evidence available at the time.

## **§4.2 Ruminations**

When an institution provides an explanation why it reached an erroneous decision, some may have a healthy suspicion towards this explanation if it implicitly exonerates that institution from responsibility. In addition, there are at least three other reasons to reject both the explanation that the erroneous conviction resulted from the missing evidence and the idea that the erroneous decision was understandable given the evidence available at the time.

### **§4.2.1 Is the Missing Evidence Explanation Persuasive?**

The missing evidence explanation is not a persuasive explanation to begin with. It is far from certain that if the missing evidence had been available during the actual trial or the first appeal, Sally Clark would have been acquitted. After the missing evidence was found, experts of both sides were asked to produce reports about this new evidence. The court then noted that ‘[i]t was apparent from these reports that there was disagreement amongst the doctors as to the significance of this evidence’ (*Clark-II*, [114]). In particular, although the new defence expert, Professor Morris, said that the ‘overwhelming staphylococcal infection is the most likely cause of death’ (*Clark-II*, [122]), this contention was strongly disputed by the prosecution and its experts.<sup>27</sup> The second appeal considered the decision between the two experts ‘very difficult’ and carefully refrained from making it.<sup>28</sup> Such a dispute should be decided by a trial

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<sup>25</sup> R Nobles and D Schiff, 'A Story of Miscarriage: Law and the Media' 31 (2) *Journal of Law and Society* 221, p. 239.

<sup>26</sup> Nobles and Schiff, *supra* 25, p. 241.

<sup>27</sup> See, in particular, Dr Klein’s testimony in *Clark-II*, [129]-[132]. See also Nobles and Schiff, *supra* 25, p. 240.

<sup>28</sup> ‘If we had been required to reach a conclusion as to which of their compelling views was correct, we should have found it a very difficult decision to make’, *R v Clark (No 2)*, [133].

court rather than by an appellate court because ‘[t]he English Court of Appeal does not have a general power to review the evidential sufficiency of convictions’.<sup>29</sup> *Prima facie*, the existence of dispute around the meaning of this allegedly-crucial evidence should have led to a retrial rather than to a verdict of acquittal.<sup>30</sup> It is only because of the decision of the prosecution not to seek a retrial that Sally Clark was released immediately after her appeal was allowed.<sup>31</sup> The case was already overburdened by many other pieces of medical evidence whose existence and meaning were in dispute between the parties’ experts, and sometimes even between the experts of the same party. It is therefore hard to see why the second appeal is so certain that yet another piece of disputed evidence would have made such a difference to the actual trial or the first appeal.

#### **§4.2.2 Does it Make the Erroneous Convictions Understandable?**

Even if the missing evidence explanation is sustainable, there is nevertheless enough evidence to reject the implied assertion that the erroneous decision was understandable given the evidence at the time.<sup>32</sup>

The decision to uphold the convictions is problematic given the evidence available at the time, even when the unavailability of the missing evidence is taken into account. The decision to uphold the convictions is troubling for several reasons. To start with, the essentiality of Dr Williams’ testimony to the prosecution’s case and many of the problems in this testimony were known to both the jury and the judges of the first appeal. The prosecution’s case about Christopher rested on three findings (bruises, torn frenulum and bleeding in the lungs). The defence made it clear that the prosecution’s case hinged on Dr William’s testimony and the quality of his observations were challenged repeatedly (*Clark-I*, [10]-[11]). It strongly contested the mere existence of two of the findings (bruises and torn frenulum) and emphasised that Dr William’s observation was the only support for their existence. The torn frenulum

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<sup>29</sup> Roberts and Zuckerman, *supra* 9, p. 84.

<sup>30</sup> The power to order a retrial is given to the court: ‘Where the Court of Appeal allow an appeal against conviction and it appears to the Court that the interests of justice so require, they may order the appellant to be retried’, Criminal Appeal Act 1968 c. 35 Pt I s. 7(1). However, unless a retrial is ordered, the default consequence of quashing a conviction is a verdict of acquittal, Criminal Appeal Act 1968 c. 35 Pt I s. 2(3).

<sup>31</sup> *R v Clark (No 2)*, [181].

<sup>32</sup> Recall that “erroneous decision” only means that the decision is erroneous *given the evidence available today* (see §2.2 above). It is therefore not necessarily contradictory to claim that the erroneous decision is understandable *given the evidence available at the time*.

was not confirmed histologically (*Clark-I*, [40]). More importantly, all the defence experts emphasised that the ‘visual diagnosis of bruises could be mistaken. The photographs were poor quality and no microscopic sections had been taken to confirm the existence or age of any bruising’ (*Clark-I*, [39]). The first appeal court was also aware that these bruises were not seen by any other person who saw Christopher’s body directly. No other member of the hospital staff that treated Christopher noticed them (*Clark-I*, [30]). Dr Cowan, a paediatrician who examined Christopher right before his death was declared, did not detect any external injuries (*Clark-I*, [21]). A Police Sergeant Marshall who saw the body did not see any visible marks on it (*Clark-I*, [22]). As for the bleeding in the lungs, amongst both the prosecution and the defence experts, Dr Williams was the only medical expert who commits himself to a specific cause of death: smothering (*Clark-I*, [28]). The other prosecution experts gave the cause of death as unascertained (*Clark-I*, [10]). Therefore, the first appeal was well aware that Dr Williams’ testimony was both crucial to the prosecution’s case and highly problematic.

Furthermore, the second appeal raises some additional concerns about Dr Williams’ testimony, which are general and unrelated to the missing evidence. One may justifiably ask how could these worries be missed or ignored by the first appeal. The first general concern is about the *way* in which Dr Williams changed his mind about Christopher’s cause of death. Recall that initially, Dr Williams considered Christopher’s death to be of natural causes (lower respiratory tract infection). Only after Harry’s death and the discussion with Professor Green, did he change his mind about Christopher’s cause of death from natural to unnatural (smothering). There is nothing a-priori wrong with an expert changing his/her mind. However, the *way* Dr Williams changed his mind is quite telling. In the words of the second appeal:

[N]ot only had Dr Williams changed [his first] diagnosis as to the likely cause of death but somewhat more surprisingly he went so far as to rule out such an infection as a possible cause of death (*Clark-II*, [52])...he was unable to explain why he had previously asserted that there was evidence of the respiratory infection but now concluded that there were no significant features of such an infection. Put at its very lowest, this aspect of the matter called into question the competence of Dr Williams (*Clark-II*, [55]).

The court raises another serious concern about Dr Williams’ practice of documenting his findings. Dr Williams based his revised opinion on the bleeding in Christopher’s lungs. However, that bleeding has not appeared in his post mortem report (which was

written right after Christopher's death and *before* Harry's death). When asked to explain why not he even noted it in his report, his explanation was that he considered it "part of the dying process" and it was "non specific finding". Be that as it may, the important point is that when the finding was against Dr Williams' opinion of the cause of death (when he considered it to be natural), he did not make any reference to it. This practice suggests, as noted by the court, that 'Dr Williams was being selective as to his recording of his findings only recording those facts that seemed to him to be supportive of his conclusion' (*Clark-II*, [46]). Sadly, it seems that Dr Williams' problematic standards of reporting and disclosing information were apparent even before the discovery of the non-disclosed missing evidence. These two general concerns were both based on Dr Williams' conduct regarded evidence which was available at the trial and thus it should be questioned why these worries were noticed only by the second appeal. The essentiality of Dr Williams' testimony to the prosecution's case and the concerns that were actually highlighted during the first appeal (together with those which perhaps should have been highlighted) should have been sufficient to raise a reasonable doubt in Sally's guilt during the trial. They also indicates that the first appeal should not have been upheld the convictions *even given the evidence available at the time*.

#### **§4.2.3 What does the Missing Evidence Explanation Imply about the Second Appeal?**

This section seeks to establish that the missing evidence explanation does not support either the first appeal decision to uphold the conviction for Christopher's murder or the second appeal decision to quash this conviction. Moreover, this section argues that the missing evidence explanation implies that at least one of these two decisions has to be wrong.

First, the missing evidence fails to explain Sally's conviction for Christopher's murder. After summarising the evidence in Christopher's case, the second appeal concludes that

If, therefore, the conviction in relation to Harry was unsafe, we have no difficulty at all in concluding that it would necessarily follow that the conviction in respect of Christopher's death was equally unsafe.<sup>33</sup>

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<sup>33</sup> *R v Clark (No 2)*, [65].

Yet, if they had ‘no difficulty at all in concluding that’, why Sally was convicted of Christopher’s murder in the first place?<sup>34</sup> To convict Sally in the murder of Christopher, there should have been enough evidence to prove her guilt in this crime beyond reasonable doubt. Even if one is willing to accept that without the missing evidence the case against Sally was really ‘overwhelming’, it was only with regards to Harry’s case. When an individual is accused of a certain crime, the admissibility of others crimes she might have done or even convicted of are subject to the exclusionary rule of ‘bad character’.<sup>35</sup> Whether the evidence about Harry should have been admissible to prove the murder of Christopher is a complex question.<sup>36</sup> However, admissible or not, it is still difficult to understand how this evidence could provide any substantial support to the prosecution’s case with regards to Christopher. The prosecution relied on a series of similarities between the two events of death (*Clark-I*, [6]). In its judgment, the first appeal gave a detailed attention to the strengths and weaknesses of the similarities as evidence (*Clark-I*, [81]-[92]). Nevertheless, the second appeal lists a series of serious doubts about these similarities (*Clark-II*, [15]-[17]). One could only wonder why these doubts were not noticed during the actual trial and the first appeal.<sup>37</sup> In light of the existence of detailed medical evidence specific to Christopher’s death, it is therefore hard to accept that the similarities evidence on its own was so crucial to the prosecution’s case that without it, the entire case falls. But if the missing evidence was the reason which prevented the first appeal to reach to the correct decision (*Clark-II*, [179]), why was Sally convicted of Christopher’s murder in the first place?

Second, the missing evidence explanation fails to answer why Sally was eventually *acquitted* of Christopher’s murder. The missing evidence related only to Harry’s death because it provides microbiological results that might suggest that Harry died from natural causes (see §4.1 above). The pathological evidence about Christopher’s death, in contrast, has remained unchanged between the two appeals. The similarities between the two deaths is the only way in which the second appeal

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<sup>34</sup> It should be noted again that the defence applied for two separate trials (one per each murder case) but its application was refused by the trial judge (*Clark-I*, [81]), and was affirmed by the first appeal, *Clark-I*, [92].

<sup>35</sup> On ‘bad character’ in general, see Roberts and Zuckerman, *supra* 9, ch. 11.

<sup>36</sup> The first appeal discusses this issue in length, *Clark-I*, [81]-[92]. For the issue of joinder of counts in the context of character evidence, see Roberts and Zuckerman, *supra* 9, pp. 538-542.

<sup>37</sup> For a similar remark, see C Wells, ‘The Impact of Feminist Thinking on Criminal Law and Justice: Contradiction, Complexity, Conviction and Connection’ [2004] (Supp (50th Anniversary Edition)) Crim LR 88, p. 97.

decision to quash the conviction for Harry's murder might have influenced the prosecution's case with regards to Christopher. Hence, if the conviction for Harry's murder becomes unsafe, the evidence about the similarities between the deaths can no longer support the prosecution's case with regards to Christopher. However, as noted above, the similarities evidence was weak to begin with, and it is hard to accept it as the crucial difference maker between the first appeal decision to uphold the conviction for Christopher's murder and the second appeal decision to quash it. Why then was the second appeal so certain that the conviction for Christopher's murder was unsafe if the first appeal concluded that 'there was overwhelming evidence of the guilt of the appellant on each count' (*Clark-I*, [238])? The missing evidence explanation provided by the second appeal fails to answer this question.

Moreover, taking these two objections together, a third objection can be derived: the missing evidence explanation implies that one of the two decisions of the Court of Appeal has to be wrong. One could claim that decision of the first appeal to uphold the convictions were understandable given the evidence at the time. One could claim that the second appeal was right in quashing the convictions given the discovery of the missing evidence. However, if the influence of the missing evidence on the prosecution's case with regards to Christopher is negligible as it is argued here, then it is inconsistent to accept both claims at the same time. Since the evidence against Sally Clark with regards to Christopher remained unchanged between the appeals, and since the similarities evidence can hardly be regarded as the difference maker between the decisions, then the prosecution's evidence with regards to Christopher remained almost unchanged between the appeals. Therefore, either the first appeal was mistaken in convicting Sally based on the evidence about Christopher's death, or the second appeal was mistaken in acquitting Sally based on the same body of evidence. If two decisions of the Court of Appeal reach to two contradictory conclusions based on the same body of evidence, one of them has to be wrong. Not only does the missing evidence explanation fail to explain each of the appeal decisions separately, it also fails to explain how these decisions could avoid contradiction.

### **§4.3 Rejecting the Missing Evidence Explanation**

To conclude, the missing evidence explanation of the second appeal should be rejected. It cannot provide an answer to the question “what went wrong” and it cannot support the implied assertion that the decision to uphold the convictions was understandable given the evidence available at the time. There are three reasons to support this conclusion. First, the missing evidence explanation is unpersuasive to begin with because it is questionable whether Sally Clark would have been acquitted even had the missing evidence been available during the actual trial or the first appeal (§4.2.1). Second, even if sustainable, this explanation does not support the implied assertion that the decision to uphold the convictions was understandable given the evidence available at the time (§4.2.2). Last, even if this explanation was true, it would fail to explain either of the decision to uphold the conviction (first appeal) or the decision to quash it (second appeal). Moreover, it would imply that one of the decisions of the Court of Appeals with regard to Christopher has to be wrong. For these three reasons, the missing evidence explanation should be rejected.

### **§5 *The Existing Answers***

It is now possible to proceed to the question of how the erroneous decision of Sally’s convictions could have been avoided given the information available at the time (i.e. even without the availability of the fresh evidence). In this context, the statistical evidence seems to immediately come to mind. This section explores three answers to this question, all of which suggest the statistical evidence as the source of the error in one way or another. The first answer is that the error resulted from the flaws in Sir Meadow’s statistical analysis. The second answer is that the erroneous decision resulted from the legal failure to use Bayes’ Theorem. The third answer is that the statistical evidence had an overwhelming psychological effect which shadowed other evidence which was more favourable to Sally.

It is important to note that none of these three answers depends on the missing evidence. Therefore, if any of these answers is correct, not only does it identify the source of the erroneous decision, it also suggests how the conviction could not have been upheld even without the availability of the missing evidence. As such, they suggest an answer to the question of how the erroneous decision of Sally’s convictions could have been avoided even given the information available at the time.

## §5.1 The Flaws in Meadow's Calculation

### §5.1.1 The suggested Answer

The first answer is that the erroneous decision resulted from the flaws in the statistical calculation which was used by Professor Sir Roy Meadow to establish that the chance of two cases of SIDS in the same family is 1 per 73 million. Meadow reached this number by first calculating the probability of a SIDS in a couple similar to the Clarks (professional non-smokers), 1 per 8,543. He then multiplied it with itself to reach the probability of two events of SIDS in the same family. This calculation was challenged based on two grounds. First, the probability of one SIDS (1 per 8,543) was contested based on another study (The CONI study, *Clark-I*, [127]). Second, and more importantly, Meadow's calculation was found fallacious for its unsupported and unjustifiable assumption of independence between the two events. Meadow assumed that the probability of the second SIDS is equal to the probability of the first SIDS.<sup>38</sup> However, this is a strong assumption which requires an empirical basis as there are numerous potential genetic and environmental reasons why a family which has already experienced SIDS before is more prone to experience another SIDS in the future than a family which have never experienced SIDS before (e.g. if the parents have certain genes which increases the risk of SIDS).<sup>39</sup> Had the calculation been done properly, the correct figure would become much lower than 1 per 73 million.<sup>40</sup> The first answer is therefore that the flaws in Meadow's statistical calculation are responsible for the erroneous decision. Such a view can be found amongst expert statisticians, such as Professor Donnelley<sup>41</sup> and Professor Dawid.<sup>42</sup> This view is also repeated in the public media.<sup>43</sup>

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<sup>38</sup> If S1 is first cot death and S2 is the second cot death, Meadow assumed that  $P(S1) = P(S2 | S1)$ .

<sup>39</sup> Indeed, few years after Sally's conviction was upheld in the first appeal, a study found a correlation between certain genes and cot deaths, << Contact David Drucker from Manchester to obtain the reference.>>.

<sup>40</sup> It was reported in the media that 'the odds are closer to 200 to one', "Cot death expert defends evidence", BBC News, <http://news.bbc.co.uk/1/hi/health/4641587.stm>. See also G Wansell, 'Whatever the coroner may say, Sally Clark died of a broken heart' *The Independent* (18th of March 2007). However, the grounds for this estimation are unclear.

<sup>41</sup> In a recent presentation, Professor Donnelley stated that '[the wrongful conviction] happened in large part here because the expert [Sir Professor Meadow] got the statistics horribly wrong'. He concluded his presentation of the case with the statement that 'there is a situation where errors in statistics had really profound and really unfortunate consequences.' The video filmed on July 2005 and can be found online at <http://www.ted.com/index.php/talks/view/id/67>. It should be noted that Donnelley refers mainly to two mistakes: the assumption of independence, which is discussed here, and the prosecutor's fallacy, which discussed in §4.2 below.

<sup>42</sup> 'Although we cannot know how the jury regarded the statistical evidence, it is reasonable to speculate that it was strongly influenced by the extremely small probability value of 1 in 73 million that

### §5.1.2 Problems in the Answer

There are at least three fundamental problems in holding the flaws in Meadow's statistical calculation responsible for the erroneous decision. First, this answer is partial as it fails to establish that had the calculation was done properly, the first appeal would not have upheld Sally's convictions. All that this answer successfully establishes is that the correct figure is much lower than the one suggested by Sir Meadow. It still lacks an important step because it does not show why getting the calculation right would have prevented the erroneous decision of Sally's convictions by the first appeal. It may well be that even if the calculation was done correctly, Sally would have still been convicted and her convictions would still have been upheld. Therefore, this answer is insufficient to explain how the erroneous decision could have been avoided.

The second problem is that these flaws were known and highlighted not only during the first appeal but also during the actual trial, before the involvement of any of the expert statisticians. The defence referred to a study which showed that cases of a second cot death are much commoner than argued by Sir Meadow.<sup>44</sup> The defence also brought a study which emphasises the possibility of unknown factors.<sup>45</sup> The court correctly noted that this evidence was used to undermine Meadow's assumption of impence (*Clark-I*, [14]). The jury was also warned by the trial judge that the 73 million figure should be regarded with caution (*Clark-I*, [128]). The judge also reminded the jury about the evidence that the risks were inherently greater in a family which had already had a SIDS death before (*Clark-I*, [124]). Given the fact that the statistics was disputed from the outset, it is hard to accept that they were responsible for the erroneous decision. It is one thing to argue that the erroneous decision was resulted from the failure of the court to get the numbers right, but it a much less

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both deaths could have arisen from SIDS, regarding this as ruling out the possibility of death by natural causes', AP Dawid, 'Bayes's Theorem and the weighing evidence by juries' 113 Proc Brit Acad 71, p. 75.

<sup>43</sup> See, for example, 'Paediatrician Professor Sir Roy Meadow, who appeared for the prosecution, estimated the likelihood of two siblings dying of "cot death syndrome" were one in 73 million. *This proved to be damning evidence.*' Obituary, 'Sally Clark' *The BBC* (17th of March 2007a), my emphasis.

<sup>44</sup> See the reference to Professor Emory's study, *Clark-I*, at [116] and [118].

<sup>45</sup> Professor Berry's testimony, *Clark-I*, at [122]-[123].

plausible argument that the erroneous decision was resulted from flaws in a calculation which was challenged from the outset.<sup>46</sup>

The third and most substantial problem in this explanation is that Meadow's statistical evidence was unessential to the prosecution case because the defence experts accepted the fact that this evidence tried to prove: that SIDS was not the cause of death. This is most prominent in Harry's case. Dr Whitwell, for the defence, testified that '[s]he would not classify this a SIDS death because a true SIDS death should be completely negative and would not normally occur at this time in the evening, after a feed, with the child in a bouncy chair' (*Clark-I*, [77]). Dr Rushton, also for the defence, went even further and 'agreed that there were features in both deaths that gave rise to very great concern and for that reason he would not class them as SIDS deaths' (*ibid*). No wonder that when considering the fallacies of Meadow's statistics, the court concluded that:

[The statistical evidence] was very much a side-show at trial. The experts were debating the incidence of genuine SIDS (unexplained deaths with no suspicious circumstances) in a case *where both sides agreed that neither Christopher's death nor Harry's death qualified as such*. (*Clark-I*, [126], emphasis added)

## §5.2 Bayes' Theorem

### §5.2.1 The Answer

It could be argued that the erroneous decision was resulted from the legal failure to use Bayes' Theorem to combine the statistical evidence with the non-statistical evidence and to assess accurately the probability of Sally's guilt given all the evidence available.<sup>47</sup> Bayes' Theorem is a mathematical formula that aims to instruct an agent how to rationally change the agent's initial (prior) probability in light of new evidence. Several eminent statisticians supported using Bayes' theorem in situations where the jury faces both statistical and non-statistical evidence.<sup>48</sup> It could be argued

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<sup>46</sup> Some criticism was directed to Mr Bevan, QC for not objecting the admissibility of this evidence. This issue is discussed below (§5.3).

<sup>47</sup> For some comments in this vein, see *supra* 41.

<sup>48</sup> In an unprecedented attempt, Professor Donnelley was allowed to take a jury through the application of Bayes' Theorem to determine guilt, *R v Adams (No 1)* [1996] 2 Cr App R 467. When asked whether both the statistical and non-statistical can be evaluated in 'statistical terms' (i.e. using Bayes' Theorem), he answered that 'it is the only logically sound and consistent approach to considering situations such as this', *ibid*, p. 471. This unprecedented attempt proliferated scholarly debate on the issue, a summary of which could be found in Roberts and Zuckerman, *supra* 9, pp. 118-120.

that the source of the error in the case of Sally Clark is the stubborn legal refusal to use the Bayes' Theorem.<sup>49</sup>

### §5.2.2 Problems in the Answer

This answer should be rejected both because the general difficulties in applying Bayes' Theorem in criminal courts and the specific difficulties in applying it in the case of Sally Clark. Consider first the general difficulties. The question of whether Bayes' Theorem should be used in courts is probably one of the most debated issues in the theory of evidence law.<sup>50</sup> With an acknowledged simplification, it is worth mentioning some of the main objections. First, Bayes' Theorem requires an assignment of prior probability of guilt, before any evidence was introduced ( $P(G)$ ). However, it is questionable how assigning prior probability of guilt could be consistent with the presumption of innocence.<sup>51</sup> Second, it is questionable whether jurors, who usually lack any statistical training, could deploy this method accurately.<sup>52</sup> Third, it is unclear how the probability of guilt which the calculation produces should be translated into a guilty/not-guilty verdict.<sup>53</sup> Last, some have argued that convicting individuals based on mathematical formulas undermines the legitimacy and the acceptability of the verdict.<sup>54</sup>

Furthermore, this answer has several further difficulties which are specific to the case of Sally Clark. First, this explanation suffers from the same problem of the previous explanation. It is insufficient because it is far from clear that Sally's convictions would not have upheld if Bayes' Theorem had been used. The case

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<sup>49</sup> '[T]o introduce Bayes Theorem, or any similar method, into a criminal trial plunges the jury into inappropriate and unnecessary realms of theory and complexity deflecting them from their proper task', Adams, *ibid*, p. 482.

<sup>50</sup> For a good summary of this intensive and extensive debate, see Roberts and Zuckerman, *supra* 9, pp. 123-132. In his controversial yet challenging book, Jonathan Cohen has provided six paradoxes which challenge the applicability of mathematical theory of probability to the legal context, LJ Cohen, *The probable and the provable* (Clarendon Library of Logic and Philosophy, Clarendon Press, Oxford 1977).

<sup>51</sup> Roberts and Zuckerman, *supra* 9, p. 125; Tribe, *supra* 1. Cohen also argues that giving the presumption of innocence its true meaning by assigning  $P(G) = 0$  will render the formula useless, Cohen, *ibid*, p. 107.

<sup>52</sup> Roberts and Zuckerman, *supra* 9, p. 126. This concern receives empirical support from the work of Tversky and Kahneman, 'Causal Schemas in Judgment Under Uncertainty' in M Fishbein (ed) *Progress in Social Psychology* (1980).

<sup>53</sup> Roberts and Zuckerman, *supra* 9, p. 127.

<sup>54</sup> Tribe; CR Nesson, 'Reasonable Doubt and Permissive Inferences: The Value of Complexity' 92 (6) *Harvard Law Review* 1187; C Nesson, 'The Evidence or the Event? On Judicial Proof and the Acceptability of Verdicts' 98 (7) *Harvard Law Review* 1357.

against Sally Clark consisted of much more than the statistical evidence.<sup>55</sup> Recall that Christopher was found to be suffering from bruises, a torn frenulum and bleedings in the lungs. Whether these were symptoms of unnatural death was the crux of the dispute between the prosecution and the defence. Even if the general difficulties of applying Bayes' Theorem in courts could be overcome, and even if the vast complexity of the medical evidence in Sally Clark case could be modelled successfully using Bayes' Theorem, it is far from clear that Bayes' Theorem would have assisted the administration of justice to avoid the erroneous decision.

Some might find comfort in the response that had Bayes' Theorem used systematically and correctly in the criminal courts, it could have reduced the overall number of erroneous legal factual decisions, even if it would not prevent this specific erroneous decision. Whilst I remain sceptic with regards to this general claim, the important point is that this response does not answer the question of what went wrong in the case of Sally Clark. *Inter alia*, it does not help answering the question of how the erroneous decision of Sally's convictions could have been avoided given the information available at the time.

## **§5.3 The Psychological Effect of the Statistical Evidence**

### **§5.3.1 The Answer**

The third answer is the source of the error lies in the psychological effect that the impressive figure of 1 per 73 million had on the jury and the judges of the first appeal. Indeed, this figure was challenged during both the trial and the first appeal (see §5.1 above). However, according to this explanation, the figure of 1 per 73 million is so impressive that it had a psychological impact which caused the suppression and the under-appreciation of the other non-statistical evidence more favourable to Sally. Stephen Clark, Sally's husband, for instance, commented that the statistics was 'an arrow through the fog' that gave the jury a compelling case against Sally.<sup>56</sup> The media has appeared to be persuaded that the statistical evidence was the source of the

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<sup>55</sup> Supra **Error! Bookmark not defined.**

<sup>56</sup> J Sweeney and B Law, 'Gene find casts doubt on double 'cot death' murders' *Guardian Unlimited* (15th of July 2001).

error.<sup>57</sup> This answer resonates a more general point made by Tribe over thirty five years ago:

The problem of the overpowering number, that one hard piece of information, is that it may dwarf all efforts to put it into perspective with more impressionistic sorts of evidence.<sup>58</sup>

Another related argument is that Sally's erroneous decision resulted from "the prosecutor's fallacy".<sup>59</sup> The prosecutor's fallacy coins a logical mistake of taking the probability of the occurrence of the evidence given the innocence of the accused as if it were the probability of the innocence given the occurrence of the evidence.<sup>60</sup> In the first appeal, Sally Clark's defence team argued that the probability of the two deaths given Sally's innocence was confused with the probability of Sally's innocence given the occurrence of two deaths. The defence alleged that the jury felt prey to the prosecutor's fallacy by understating Meadow's statistics as showing that the probability of Sally's innocence given these two deaths is 1 per 73 million, instead of understanding it as the probability of two deaths if Sally is innocent is 1 per 73 million (*Clark-I*, [101]).<sup>61</sup>

These two arguments may be used to establish the following explanation. Regardless Meadow's flaws in the calculation and the essentiality of the statistical evidence to the prosecution's case, the statistical evidence is responsible for the erroneous decision because it diverted the attention from other non-statistical evidence which was more favourable to Sally. If the statistical evidence had not been

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<sup>57</sup> 'The statistic was quoted in every headline and is widely believed to have led to Sally Clark's conviction', K Barraclough, 'Stolen Innocence: A Mother's Fight for Justice--The Story of Sally Clark (Book Review)' [2004] 329 BMJ 177; 'The jury at Sally Clark's trial, however, was apparently persuaded by the evidence of a leading expert called by the prosecution, Professor Sir Roy Meadow, who maintained that the chance of two cot deaths occurring in a single affluent family was "one in 73 million', Obituary, 'Sally Clark' *Daily Telegraph* (19th of March 2007b).

<sup>58</sup> Tribe, *supra* 54, p. 1360.

<sup>59</sup> For more about the prosecutor's fallacy, see D Balding and P Donnelly, 'The Prosecutor's Fallacy and DNA Evidence' [1994] Crim LR 711. Concise explanations may be found in *R v Doheny and Adams* [1997] 1 Cr App R 369, pp. 372-374 and in the website of the Crown Prosecution Service, [http://cps.gov.uk/legal/section13/chapter\\_f.html#\\_Toc7839912](http://cps.gov.uk/legal/section13/chapter_f.html#_Toc7839912).

<sup>60</sup> In a formal notation, where P(x) stands for the probability that the proposition x is true, P(x | y) for the probability of x given that proposition y is true, G for the proposition that the accused is guilty (and -G for the proposition that he is innocent), and E for the occurrence of the evidence, the prosecutor's fallacy means the confusion of P(E | -G) with P(-G | E)). See also Balding and Donnelly, *ibid*, ft. 16.

<sup>61</sup> Interestingly, under the title of the "prosecutor's fallacy", the court refers to another common mistake in interpreting statistics, which is applying base-rate frequencies (indefinite probability) to an individual case (definite probability). For this difficult problem, see JL Pollock and J Cruz, *Contemporary theories of knowledge* (2nd edn, Rowman & Littlefield, Lanham ; Oxford 1999), pp. 92-111. They argue that none of the existing theories of probabilities can support a move from indefinite to definite probabilities.

admitted at all, the other evidence would have received the adequate attention and the error would have been prevented. Prima facie, this explanation suggests a neat answer to the question of how could the erroneous decision be avoided given the information available at the time. The answer is that the statistical evidence should have never been admitted to start with.

### **§5.3.2 Problems in the Answer**

#### **§5.3.2.1 *Unfounded Empirical Assumption***

This answer is not as persuasive as it might look. First, this answer relies on the empirical assumption that when considering statistical evidence, people would give it more weight than it actually deserves. However, several commentators pointed out that empirical research reveals the stark opposite.<sup>62</sup> For example, the influential psychological experiments conducted by Kahneman and Tversky show that humans tend to disregard statistical evidence (“background information”) when other specific evidence is also available.<sup>63</sup> If there is a worry about the evaluation of the statistical evidence, it is more likely to involve unjustified *underweighting* of it rather than any overwhelming effect.

These empirical findings establish something which for many lawyers may seem obvious: that when specific evidence is available, the fact-finder is unlikely to be impressed by base-rate statistics. Assume the following hypothetical scenario. Similar to the case of Sally Clark, the fact-finder is presented with the 1 per 73 million figure. However, unlike in the real case, she is also presented with other specific evidence which clearly shows a *natural* cause of death (and all involved medical experts agree about it). Could it be seriously argued that the fact-finder would be so overwhelmed with the 1 per 73 million figure that she would convict despite this consensual evidence for natural cause of death? If anything, the fact-finder is more likely to fail to give this base-rate statistics the weight it is deserved according to the Bayesians.

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<sup>62</sup> M Dant, 'Gambling on the Truth: The Use of Purely Statistical Evidence as a Basis for Civil Liability' 22 Columbia Journal of Law and Social Problems 31; D Shaviro, 'Statistical-Probability Evidence and the Appearance of Justice' [The Harvard Law Review Association] 103 (2) Harvard Law Review 530, ft. 49 [henceforth 'Shaviro (comment)'].

<sup>63</sup> D Kahneman, P Slovic and A Tversky, 'Evidential Impact of Base Rates' *Judgment under Uncertainty: Heuristic and biases* (CUP, New York 1982)

These empirical findings are relevant for the case of Sally Clark. Although the meaning of the specific evidence available in this case was constantly disputed, the fact-finder had immensely detailed *specific* evidence to consider, mostly about the pathological findings found in the autopsy of the two babies.<sup>64</sup> These empirical findings may suggest that it is unlikely that this specific evidence was suppressed by the general base-rate statistics presented by Meadow.

### ***§5.3.2.2 The Applicability of the Judges of the First appeal***

To the extent this explanation has strength, it is mainly in regards to the jury rather than to the judges of the first appeal. Even in regards to the jury, the evidential basis for the defence expert statisticians' concern that the jury was fell prey to the prosecutor's fallacy remains unclear.<sup>65</sup> However, the erroneous decision was reached by the judges of the first appeal. In general, judges have more experience in dealing with complex and scientific evidence because such evidence appears in many cases and evaluating it is a repeating task in their day-to-day routine. More importantly, the judges of the first appeal were equipped with the expert opinions of two distinguished statisticians (Professor Phil Dawid and Dr Ian Evett).<sup>66</sup> Therefore, it is hard to accept that the judges of the first appeal fell prey to some overwhelming psychological effect, even if one was actually existed, or to the 'prosecutor's fallacy', especially since they were warned about it specifically by the expert statisticians' reports, if such a warning was actually needed.

### ***§5.3.2.3 The Rest of the Prosecution Case***

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<sup>64</sup> For a summary of this evidence, see *Clark-I*, [7]-[8]. For a detailed description of the prosecution's medical evidence, see *Clark-I*, [25]-[33] for Christopher, and *Clark-I*, [50]-[63] for Harry.

<sup>65</sup> See the detailed discussion, including extracts from the actual trial, which is brought in the decision of the first appeal, *Clark-I*, [152]-[168].

<sup>66</sup> The court was satisfied with their written reports and the statisticians were not called to give oral testimony. This was mistakenly conceived as legal unwillingness to engage in the statistical issues at stake. However, this is a misunderstanding of the legal procedure, which allows expert opinion to be given either in oral or written testimony (CRIMINAL JUSTICE ACT 1988 CHAPTER 33 s 30(1)). In the case of Sally Clark, not only the statistics was justifiably regarded as 'side-show' (*Clark-I*, [126], and see §5.1.2 above), but also the accepted the defence's point 'that the judge appeared to endorse the prosecution's erroneous' (*Clark-I*, [168]) and defined '[t]he ultimate question' as 'whether the error of approach rendered the conviction unsafe' (*Clark-I*, [168]). This is a question of law rather than of statistics and medicine.

Perhaps most importantly, this answer seems to imply that without the statistical evidence, the prosecution case would have been much weaker.<sup>67</sup> However, it is important to recall that not only the statistical evidence was unessential to the prosecution's case (see §5.1.2 above), but also that the prosecution's case was strong in its own right. In the *weaker* case of Christopher, the prosecution pointed out to bruises, torn frenulum, and fresh bleeding in the lungs. The defence challenged the existence of each of these pieces of evidence, and they received thorough and repeated scrutiny both during the long trial and in the lengthy decision of the first appeal. Yet, it is worthwhile to note that

Each [of the defence medical experts] agreed that if there was bruising, the injury to the frenulum and bleeding in the lungs, it suggested asphyxia. (*Clark-I*, [40])

It should be emphasised that the prosecution's case did not hinge on a single piece of medical evidence (not to mention the even more worrying evidence relates to Harry).<sup>68</sup> Even if the defence was successful in drawing doubt in one of the pieces of evidence, the cumulative weight of these pieces of evidence together probably was (and should have been) higher than the sum of its parts. It is therefore seriously questionable whether excluding the statistical evidence would have prevented the decision to uphold the convictions.

#### **§5.4 Aftermath: Should the Statistical Evidence be Excluded?**

It could be implied from the last section that the admission of the statistical evidence was legitimate. However, this section argues that even though excluding the statistical evidence was unlikely to prevent the erroneous decision (see §5.3 above), admitting it was nevertheless inappropriate and wrong.

The first appeal concluded unequivocally that this statistical evidence is admissible.<sup>69</sup> In contrast, the second appeal commented that

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<sup>67</sup> One newspaper even went as far as asserting that the statistical evidence was almost the only evidence existed against Sally: 'you are incarcerated for their killing - *for almost no other reason* than that a leading paediatrician, Sir Roy Meadow, was permitted to tell the jury that the chances of their being two infant deaths in the same family was one in 73 million, when the truth was more like one in 200', Wansell, *supra* 40, my emphasis. See also T Shaikh, 'Sally Clark, mother wrongly convicted of killing her sons, found dead at home' *The Guardian* (March 17 2007).

<sup>68</sup> See a summary in *Clark-I*, [8] and a detailed description in *Clark-I*, [50]-[63].

<sup>69</sup> 'That evidence was clearly relevant and admissible for the reasons set out above', (*Clark-I*, [150]).

If there had been a challenge to the admissibility of the evidence we would have thought that the wisest course would have been to exclude it altogether. (*Clark-II*, [177])

It is argued here that the approach of the second appeal should be preferred.<sup>70</sup> Even if using statistical evidence may contribute to the accuracy of legal fact-finding, accuracy is not the sole aim of the legal process.<sup>71</sup> The law in general and the criminal law in particular assume that human beings should be regarded as autonomous individuals who have the capacity to freely choose their conduct, at least to some extent. Admittedly, this assumption is contentious in metaphysics, yet it is a fundamental element in our contemporary criminal law.<sup>72</sup> Using statistical evidence to prove the individual's misconduct and guilt infers his/her misconduct from other people similar to him or her. Such inference treats the accused as a predetermined mechanism whose behaviour can be learned from the behaviour of other similar mechanisms.<sup>73</sup> It 'ignores the defendant's capacity to diverge from his associates or from his past, thereby demeaning his individuality and autonomy'.<sup>74</sup> Therefore, such an inference is inappropriate in the criminal context.

One may justifiably point out that the statistical evidence in the Sally Clark case was not about the rate of misconduct amongst people similar to Sally, but about the chance for two SIDS case in the same family. To answer this point, it perhaps best to refer to the testimony of Professor Dawid, the expert statistician, who states:

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<sup>70</sup> For the same conclusion, see Dwyer, *supra* 2, p. 268. It should be noted that there is no formal rule of evidence that excludes statistical evidence, Roberts and Zuckerman, *supra* 9, p. 117. Since every piece of relevant evidence is admissible unless it is subject to an exclusionary rule of evidence (*ibid*, p.96), *prima facie* statistical evidence is always admissible. Nevertheless, it is hard to deny that there are some obvious examples where statistical evidence would not be admitted (e.g. the rate of misconduct amongst people of the same gender or race as the accused). The text above discusses the justification for excluding such evidence. However, identifying the particular legal provision which may allow such exclusion is beyond the scope of this paper.

<sup>71</sup> For the recognition that ascertaining the truth is not the sole aim of the law of evidence, see Roberts and Zuckerman, *supra* 9, p. 19; DT Wasserman, 'The Morality of Statistical Proof and The Risk of Mistaken Liability' 13 *Cardozo Law Review* 935, p. 940. Stein takes this recognition a bit further and argues that 'the key function of evidence law is to apportion the risk of error in conditions of uncertainty, rather than facilitating the discovery of the truth', Stein, *supra* 15, p. x. Stein's theory in general and its epistemic elements in particular, is discussed in A Pundik, 'Epistemology and The Law of Evidence: Four Doubts about Alex Stein's Foundations of Evidence Law' 25 *Civil Justice Quarterly* 504.

<sup>72</sup> A Ashworth, *Principles of criminal law* (5th edn, Oxford University Press, Oxford 2006), pp. 28-30.

<sup>73</sup> Wasserman, p. 952.

<sup>74</sup> Wasserman, *supra* 73, p. 943.

The laws of probability now focus attention on, not the absolute values of these probabilities of the two deaths in one family arising from the different causes considered, but on their **relative** values.<sup>75</sup>

He then concludes that

[S]uch a figure [the chance of two SIDS in the same family] could only be useful if compared with a similar figure calculated under the alternative hypothesis that both babies were murdered.<sup>76</sup>

It is therefore argued that the statistical evidence about the probability of two SIDS deaths in one family should have been excluded because to make it meaningful, it requires *a comparison with the probability a mother murdering her two babies*. The guilt of an individual should be proved with the particular facts of her case rather than with the proportion of misconduct amongst other people with similar characteristics to her. If a piece of evidence cannot become meaningful without referring to such a proportional misconduct (as per the expert statisticians), then that evidence should be excluded too. It perhaps most suitable ending this section with the warning given to the jury in the actual trial by the trial judge, Harrison J:

However compelling you may find those statistics to be, we do not convict people in these courts on statistics. It would be a terrible day if that were so. If there is one SIDS death in a family it does not mean that there cannot be another one in the same family...it is of course necessary for you to have regard to the individual circumstances relating to each of these two deaths before you reach your conclusion on the two counts on this indictment. (taken from *Clark-I*, [165])

## **§6 An Alternative Answer**

Having rejected the explanations related to either the missing evidence or the statistical evidence, it is the purpose of this section to suggest an alternative answer. It should be emphasised from the outset that though this answer may be more adequate than the existing ones, I am not convinced that it is fully satisfactory. This paper rejects the idea that erroneous decision is understandable given the epistemic

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<sup>75</sup> §18 to his expert opinion, which could be found in [www.ucl.ac.uk/~ucak06d/SallyClark\\_report.doc](http://www.ucl.ac.uk/~ucak06d/SallyClark_report.doc) (emphasis original). This view is repeated in Dawid, *supra* 42, p. 76.

<sup>76</sup> Taken from the conclusion of the expert opinion. Same point appeared in the expert opinion of Dr Evett too, *R v Clark (No 1)*, [160]. The first appeal rejected such an exercise of comparing probabilities as 'not realistic' (*Clark-I*, [160]), with reference to *Adams*, where it was decided that 'to introduce Bayes Theorem, or any similar method, into a criminal trial plunges the jury into inappropriate and unnecessary realms of theory and complexity deflecting them from their proper task', *R v Adams (No 1)*, p. 482. Bayes' Theorem is discussed above, §5.2.

constraints (see §4 above). However, it should be emphasised again that the possibility that this erroneous decision was unavoidable given the administrative constraints of the administration of justice is left open (see §2.3).

Having said that, this section seeks to suggest an alternative answer to the question of how could the erroneous decision could have been avoided given the information available at the time. The first section shows that main dispute in the case of Sally Clark was on the element of causation: whether the babies' cause of death was natural or unnatural (§6.1). It is then suggested that the conviction should be attributed mainly to the unavailability of alternative innocent explanations for too many suspicious pieces of evidence which may indicate an unnatural cause of death (§6.2). However, this conceived lack of alternative explanations relied on a misinterpretation of the definition of SIDS (§6.3). This misinterpretation had serious implications for Sally's defence, and for that reason, it is suggested as a possible answer to the question of how the erroneous decision could have been avoided, even given the evidence available at the time (§6.4). If this answer is correct, it gives rise to three important lessons that should be learnt from the case of Sally Clark (§6.5).

### **§6.1 The Importance of the Cause of Death**

This section seeks to show that the main dispute in the case of Sally Clark was on the question whether the babies' cause of death was natural or unnatural. To do that, a simplified introduction to the offence of murder is required. With an acknowledged simplification, to establish murder, the prosecution has to prove beyond reasonable doubt three elements about the factual aspect of the crime (*actus reus*) and one element about the mental aspect of the crime (*mens rea*).<sup>77</sup>

The first element is the consequence, which is the fact the victim has died.<sup>78</sup> The fact that the two babies were dead was not disputed by the defence. The second element is identity, which is the fact that it was the accused who caused the death

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<sup>77</sup> The offence of murder has not been defined by any statute but is part of the Common Law tradition from the 17<sup>th</sup> century. It should be noted that analysing murder as requiring the above four elements is *not* the conventional way to analyse the offence of murder. The conventional way refers to Coke's definition and discusses each phrase in it separately (see, for example, Card, *supra* 11, and Ormerod, *ibid*). The analysis in the text above is inspired by T Anderson and W Twining, *Analysis of evidence : how to do things with facts* (Weidenfeld and Nicolson, London 1991), see p. 137 for an example. Also, for sake of simplicity, complicating issues in the offence of murder, such as grievous harm, meaning of intent, public or private defences, etc. are not included in this brief introduction.

<sup>78</sup> This element might be in dispute when, for examples, the definition of when life begins and ends are unclear, Card, *supra* 11, §7.3, p. 242; Ormerod, *supra* 11, pp. 430-434.

rather than another person. This element was also not disputed directly because no one suggested an unnatural death caused by someone other than Sally.<sup>79</sup> The third element is causation, which is the fact that it was the accused's misconduct which caused the victim's death. In *Clark*, the question of cause of death was the main area of dispute between the parties. Most of the evidence in this case focused on this question (e.g. pathological findings, the statistical evidence, etc.).

The mental element of the offence of murder is intent and the prosecution needs to prove the fact that the accused had a mental attitude of intention toward the consequence of his/her conduct.<sup>80</sup> In general, the issue of intention receives very little attention in the case of Sally Clark because relevant evidence was rendered inadmissible. Before to the trial, the defence applied for the exclusion of evidence about alleged drinking problems and the application was granted to prevent prejudicial effect.<sup>81</sup> It was then become difficult for both parties to address the mental aspect of the murder offence. Furthermore, since the defence disputed the cause of death, the claim of infanticide was not raised.<sup>82</sup> Infanticide is an offence where the mother whose 'balance of her mind was disturbed by reason of her not having fully recovered from the effect of giving birth to the child'.<sup>83</sup> The mental element, therefore, was hardly an issue in this case. This lack of attention to *mens rea* (the mental element) exemplifies the general difficulty that courts have with the proof of intention,<sup>84</sup> and may even provide another alternative answer to the research question (see §6.5 below).

For the purpose of this section, the important point is that from all four elements of murder, the babies' cause of death was the main dispute between the parties. The prosecution had to prove beyond reasonable doubt that Christopher's

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<sup>79</sup> After seeing a TV show on this case, and without fully considering the rest of the evidence in this case, Professor Southall accused Stephen Clark, Sally's husband, in murdering the two babies and became involved in a care proceedings in relation to the Clarks' third child, who was looked after by Stephen. As a result of this unfounded accusation, a GMC ruling prohibited him to take Child Protection work for three years. The GMC ruling can be found in <http://www.sallyclark.org.uk/GMCRuling.html>. The GMC ruling was partly overturned in appeal,

Council for the Regulation of Healthcare Professionals v General Medical Council, [2005] EWHC 579.

<sup>80</sup> The issue of intention, or 'malice aforethought', is one of the most difficult issues in the offence of murder, see Card, supra 11, §7.12-§7.16, pp. 247-250; Ormerod, supra 11, pp. 436-439. For an excellent theoretical background, see Ashworth, supra 72, pp. 174-181.

<sup>81</sup> Nobles and Schiff, supra 25, p. 234.

<sup>82</sup> Card, supra 11, §7.69-§7.70, pp. 301-302; Ormerod, supra 11, pp. 497-499.

<sup>83</sup> Infanticide Act 1938, s 1(1).

<sup>84</sup> Cane, for example, raises a series of difficulties to prove intention, P Cane, 'Mens Rea in Tort Law' 20 Oxford Journal of Legal Studies 533. Card is more optimistic (Card, supra 11, §4.17-4.18, pp. 141-143), although the empirical basis for this optimism is unclear.

death was caused unnaturally. The defence case was that the cause of death could not be ascertained. Recall that the defence only needs to establish a reasonable doubt in the prosecution case. It is important to recognise that had the defence was successful in convincing the court that the cause of death remains unknown, the prosecution would have failed to convince the court that the element of causation was proven beyond reasonable doubt. This recognition may help to explain why most of the trial and evidence was spent on the question of cause of death. More importantly, it helps to explain why excluding natural cause of death was so crucial for the prosecution case.

## **§6.2 The Lack of Alternative Explanations**

The starting point for the suggested answer is that the defence did not have alternative explanations to offer. The defence was unable to offer any *concrete* natural cause of death for Christopher. The natural cause originally specified by Dr Williams, the pathologist, before he changed his mind to asphyxia, was lower respiratory tract infection. However, this explanation was not repeated by any of the defence experts and was explicitly rejected by Sir Professor Meadow (*Clark-I*, [33]). Dr Williams explained his earlier choice in the fact that he was under pressure to specify some cause for the funeral to take place, so he gave his best opinion at the time (*Clark-I*, [25]). Professor Green (prosecution) regarded this as understandable mistake (*Clark-I*, [33]). The only specific cause that the defence had to offer was Professor David's suggestion of haemosiderosis (*Clark-I*, [11]). However, this cause was rejected by both the prosecution experts (*ibid*) and the rest of the defence experts (*Clark-I*, [41]). It was also acknowledged that other classical signs of this rare disease were missing in Christopher's case (*ibid*). Moreover, as noted above (§5.1), even the defence medical experts agreed that the cause of death is unlikely to be SIDS. The defence's legal representatives were therefore understandably unable to even suggest any alternative innocent explanation for the death.

The vacuum, which was created by lack of any plausible innocent candidate for cause of death that the defence could offer, was filled with a unified and consistent rejection of natural cause of death by the prosecution's experts. Professor Sir Meadow excluded this option (*Clark-I*, [33]). Professor Green felt that it was extremely likely that the death was other than natural (*ibid*). Dr Keeling was unable

to find a natural explanation for the death (*ibid*). In comparison to the lack of agreements amongst the defence's experts, the prosecution was able to present a consistent line according to which the cause of death was unnatural.

Furthermore, the defence was also unable to suggest a concrete innocent explanation for some suspicious pathological finding. As noted above (§4.2.2), they were mainly three pathological findings (bruises, torn frenulum and bleeding in the lungs). Whilst the existence of some was disputed, it should be emphasised that the defence could not provide innocent explanation for those pathological findings, if they really exist. Dr Williams' earlier view was that the bruises were the result of the resurrection (*Clark-I*, [11]). However, this view was not repeated by any of the defence experts and was explicitly rejected by all prosecution experts (*Clark-I*, [30]), including Dr Williams himself (*Clark-I*, [11]). As for the torn frenulum, which the prosecution experts suggested as a sign of abuse consistent with smothering (*Clark-I*, [31]), the innocent explanation of resurrection was rejected not only by the prosecution experts but also by all defence experts (*Clark-I*, [40]). As for the new bleeding in the lungs, whilst the defence experts insisted that it is not a *diagnostic* marker for asphyxiation, they admitted that it is nevertheless a marker for it (*Clark-I*, [41]). In total, even the medical experts agreed that if these three pathological signs existed, it suggests asphyxia (*Clark-I*, [40]). The defence was again left with no concrete innocent explanation for the suspicious pathological findings.

It is therefore suggested that the jury in the actual trial convicted Sally, and the judges of the first court upheld this conviction, because they did not have alternative innocent explanations for too many of the prosecution's evidence and arguments.<sup>85</sup> The prosecution case was not perfect (as real cases tend to be), and the defence did very well in highlighting the deficiencies in the prosecution's evidence, arguments, and explanations. Limited by what was available to it by its own medical experts, the defence could not seriously suggest concrete alternative explanations for too many pieces of adverse evidence. In the central question of Christopher's cause of death, the defence invited distinguished medical experts who questioned various aspects in the prosecution's contention that the cause of death was unnatural. However, the defence could not identify any other natural candidate for cause of death, including

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<sup>85</sup> Similar explanation is mentioned residually in Wells, *supra* 37, p. 99. However, Wells suggests a feminist reading of the case of Sally Clark. With some sympathy to her general feminist thesis, it is not fully clear how the case of Sally Clark supports her general thesis (see, in particular, the comments in *ibid*, p. 100). However, it is outside the scope of this paper to engage with her argument in full.

SIDS. In the question of the suspicious pathological findings, the defence questioned their existence, but was unable to suggest any innocent explanation for any of them. This may indicate that the source of the erroneous decision lies in the lack of alternative innocent explanations.

It may be useful to try imagining the situation faced by the judges of the first appeal (this is before the beginning of the somewhat one-sided and uninformed media coverage). An experienced pathologist, Dr Williams, testifies about some suspicious pathological findings. The other experts dispute in length (and with the unfair advantage of the hindsight) whether he should have performed more thorough examination. Yet there is a remarkable consensus between all experts that if these findings are reliable, they indicate unnatural death. In addition, the evidence includes the expert opinion of one of the most distinguished paediatricians at the time, who was even knighted for his contribution to paediatric, Professor Sir Meadow. During his long testimony, Meadow mentions the infamous 1 per 73 million figure. The experts are engaged in a lengthy dispute about this figure, but another remarkable consensus arises as the experts of both parties agree that SIDS can be ruled out as a possible cause of death. You are then left only with the testimony of Sally Clark, who desperately hangs to the SIDS explanation.<sup>86</sup> Regardless the credibility you attribute to her, you cannot avoid the recognition that her own medical experts ruled this option out. Against a relatively consistent prosecution case, you are given a scattered defence case where its experts sometimes seem to be in more agreement with the prosecution experts than within themselves. Most importantly, despite of the aid of eminent medical experts, the defence cannot identify any candidate for alternative innocent explanation for the death, let alone establish that this candidate is sufficient to draw a reasonable doubt in the prosecution's case. Facing all of that, and without the hindsight we have today, would you quash the convictions?

### **§6.3 SIDS Again**

It is in this context that the issue of SIDS was brought up. It is therefore required to reconsider more carefully the meaning and the definition of SIDS. The definition used by the court is:

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<sup>86</sup> For the differences between the Sally's claim of SIDS and the defence 'official line' that the prosecutions failed to prove unnatural cause of death, see Nobles and Schiff, *supra* 25, pp. 232-233.

[T]he sudden death of a baby that is unexpected by history and in whom a thorough necropsy examination fails to demonstrate an adequate cause of death. (*Clark-I*, [102])

The court then immediately noted that

Clearly the accuracy of that definition depends on the pathologists' thoroughness in autopsy, and on his or her interpretation of the findings. (*Clark-I*, [103])

The important point to notice is that an infant death may be classified as SIDS only if the uncertainty arises from the imperfection of our scientific knowledge. If there is some uncertainty about the thoroughness of the autopsy, the case cannot be classified as SIDS. For that reason, the court also referred to another wider definition, SUDI, which includes several other categories, either natural or unnatural (*Clark-I*, [103]).

However, the first appeal also referred to SIDS as a basket classification for all unexplained natural deaths. The court described SIDS as one of the categories of SUDI and regards 'true SIDS' as 'unexplained and unsuspecting natural deaths' (*Clark-I*, [103]). When discussing the statistical evidence, the court again refers to SIDS as 'unexplained deaths with no suspicious circumstances' (*Clark-I*, [126]). When describing the CESDI report on which Meadow relied, the court mentions that it is based on 456 SUDIs, '[o]f these 93 were later fully explained leaving 363 finally classified as true SIDS' (*Clark-I*, [107]). Referring to SIDS as a basket classification for all unexplained natural causes of death opens the door for two source of uncertainty. Like before, SIDS includes cases where our existing scientific knowledge is insufficient to determine the cause of death. However, this basket classification also includes cases where the existing scientific knowledge cannot be properly applied to the case because problems in the autopsy. These are cases where out current scientific knowledge might have suffice to determine the cause of death had the autopsy was thorough enough. By removing the requirement for 'thorough necropsy examination' SIDS has turned from a category of cases which cannot be explained using our existing knowledge into a category of cases which cannot be explained *per se*, regardless the reason why they cannot be explained.

#### §6.4 The Implications of the Misinterpretation

This subtle difference was crucial to the case of Sally Clark. The prosecution tried to prove an unnatural cause of death using two alternative routes. The first was using specific pathological findings which suggest either unnatural cause of death, or previous abuse which in turn supports an unnatural cause of death. The second route was to prove unnatural cause by excluding natural cause. From a pure logic perspective, a cause of death can either be natural or unnatural. There is no third option. The prosecution thus supported its contention that the Christopher's cause of death was unnatural by seeking to exclude natural cause of death. First, the prosecution sought to exclude any concrete natural cause that could have been used by the defence (e.g. lower respiratory tract infection or Professor David's suggestion of haemosiderosis). Then, the prosecution sought to exclude the possibility of natural yet unexplained cause of death. It is here when the SIDS came to the forestage. The defence medical experts relied on the medical definition of SIDS and accept that Christopher and Harry's death cannot be classified as SIDS. Presumably, they accepted this because they held that the autopsy was insufficiently thorough to support a SIDS classification.<sup>87</sup> However, misinterpreting SIDS as 'unexplained and unsuspecting natural deaths' (*Clark-I*, [103]) might be conceived as if the defence experts have admitted that 'unexplained and unsuspecting natural' cause of death could be excluded.

However, it should be emphasised that except Dr Williams, the rest of the pathologists, defence and prosecution alike, accepted that Christopher's cause of death *could not be ascertained* (*Clark-I*, [10]). As for Dr Williams, it was already noted above that his testimony suffered from various difficulties that were recognised, or should have been recognised, by the first appeal (see §4.2.2). It should be noted that if a cause of death cannot be ascertained, it *logically follows* that 'unexplained and unsuspecting natural deaths' cannot be excluded. However, since the SIDS was misinterpreted as 'unexplained and unsuspecting natural deaths', by successfully excluding SIDS, the prosecution was mistakenly perceived as successfully excluding unexplained and unsuspecting natural cause too. By excluding unexplained and

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<sup>87</sup> For a remark in this vein, see Nobles and Schiff, *supra* 25, p. 230. However, it should be noted that Dr Rushton for the defence also remarked that Christopher and Harry lack typical pathological findings of SIDS (*Clark-I*, [77]). Even without being a specialist, one may be justifiably concerned how unexplained cause of death can have *typical* pathological findings in the first place.

unsuspicious natural cause, the court was left with the inevitable conclusion that the cause of death must be unnatural.

The misinterpretation of the SIDS definition may therefore suggest the following answer to the question of how the erroneous decision could have been avoided given the information available at the time. Perhaps had the exclusion of SIDS not been perceived as an exclusion of ‘unexplained and unsuspecting natural deaths’, the court would have noticed that if the cause of death could not have been ascertained, it logically follows that ‘unexplained and unsuspecting natural deaths’ cannot be excluded. If natural cause of death cannot be excluded, it is hard to see how the prosecution could have been successful in proving *beyond reasonable doubt* that Christopher’s cause of death was unnatural.

### **§6.5 Some Lessons instead of a Summary**

It is almost truism to acknowledge that most if not all fact-finding decisions, both legal and non-legal, are made in conditions of uncertainty. In most types of investigation, the ultimate goal is to reach the most accurate decision under these limitations. Therefore, even if an autopsy is not thorough, or even if the existing scientific knowledge is not perfect, there may be situations where non-legal inquirers might need to reach a tentative conclusion about the cause of death despite these limitations.

However, the same cannot be said on the criminal context. The presumption of innocence and the requirement for proof beyond reasonable doubt express an acknowledged preference for one type of mistakes (acquitting guilty individuals) over other types of mistake (convicting innocent individuals). The literature is occupied with attempts to provide justifications for this preference.<sup>88</sup> For instance, a persuasive justification is that the criminal proceedings impose moral and social censures on the convicted individual. An individual who was erroneously convicted would therefore be a victim of grave injustice.<sup>89</sup> Another justification points to the inequality in

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<sup>88</sup> A good and concise survey of this issue may be found in Roberts & Zuckerman, *supra* 9, pp. 344-360.

<sup>89</sup> Roberts & Zuckerman, *supra* 9, p. 13. To show the importance of these moral and social censures to the individuals who are erroneously convicted, Roberts and Zuckerman bring various cases where the individuals continue to struggle to clean their names even long after they finish serving their sentence, see *ibid*, ft. 52.

resources and coercive powers between the state and the individual.<sup>90</sup> Regardless which justification is correct, the importance of this preference to our contemporary legal system is rarely denied. The Law of Evidence tries to give this preference a legal meaning by using two *procedural mechanisms*: the requirement for proof to beyond reasonable doubt and the presumption of innocence. Albeit these two procedural mechanisms are perhaps the hallmark of criminal evidence law, numerous other evidential rules may be viewed as aimed to give a procedural meaning to this preference.<sup>91</sup>

In general, the case of Sally Clark should be taken as an important lesson about these procedural mechanisms. Insisting on procedural mechanisms is too-often conceived as canny technique of well-paid lawyers to help their criminal clients to evade the law. Indeed, the rationale for some complicated procedural mechanisms is far from clear and reforming locale areas of criminal evidence law may be required.<sup>92</sup> However, the case of Sally Clark should serve as a general warning about the importance of procedural mechanisms in general. This general warning may also be concretised to an important lesson about the proof of complex elements such as causation and intention. The fact that these elements are very complicated to define and to prove in courts should lead to giving them more attention rather than neglecting them. Yet, the case of Sally Clark raises some troubling concerns about the way in which these two elements are proved in practice, and the consistency of this practice with the requirement of proof beyond reasonable doubt.

As for causation, it is suggested here that when a cause of death cannot be ascertained, despite the involvement of so many scientific experts, courts should not make their best guess based on the (partial) information available. Surely, as acknowledged above, uncertainty may exist in any criminal case and legal fact-finding may always be conducted under conditions of uncertainty.<sup>93</sup> *Inter alia*, science is constantly developing and what is thought to be the cause of death today might change in the future. However, it is one thing to convict based on established scientific proclamation of the cause of death which is later turns to be mistaken. It is

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<sup>90</sup> Roberts & Zuckerman, *supra* 9, p. 15.

<sup>91</sup> Perhaps one of the main contributions of Stein's recent book is its successful attempt to pin various specific and sometimes quite technical rules of evidence in a large and systematic framework of this preference, Stein, *supra* 15, ch. 6.

<sup>92</sup> See, for example, Roberts and Zuckerman's comprehensive criticism on the implementation of the rule against hearsay in the Common Law, Roberts and Zuckerman, *supra* 9, pp. 602-623.

<sup>93</sup> *Supra* 15.

completely different thing to convict an individual despite the scientific inability to establish that the cause of death of her alleged victims were unnatural. Since the case of Sally Clark is much closer to the latter situation, it should serve as a regrettable lesson that if the scientific information is insufficient to ascertain the cause of death, this by itself is amount to a reasonable doubt that the individual should be acquitted. If experts and scientists are unable to ascertain the cause of death, the legal fact-finder should not try to do his best. The implications of the presumption of innocence for the practice of proof of causation should be that scientific uncertainty about the cause of death should lead to an acquittal.

A similar point should be made about intention. In the non-legal context, the mental state of a mother who murders her two babies in two separate occasions requires an explanation. Were they psychopathic attacks or planned cold-blooded murder? In the legal context, the requirement is not merely for an explanation, but the prosecution should prove beyond reasonable doubt that the accused had *the intention to kill*. Yet, in the case of Sally Clark, the element of intention was not a ground for the appeal and the court did not dedicate a single word to this issue. It remains unclear what *admissible* evidence was used or could have been used to prove beyond reasonable doubt that Sally Clark had the intention to kill her two babies. The case of Sally Clark should serve as a regrettable reminder that if the evidence is insufficient to prove the accused's intention beyond reasonable doubt, she should be acquitted.

It should be emphasised that the suggested lesson is *not* the simplistic assertion that *any doubt* in the accused's guilt should lead to an acquittal. Recall that the criminal standard of proof beyond reasonable doubt does not merely refer to "doubt" but it refers to "*reasonable* doubt". The concept of "reasonable doubt" requires a distinction between reasonable and unreasonable doubts, or between the conditions of uncertainty under which the conviction is safe and the conditions under which it is unsafe. How to make this distinction is perhaps one of the main questions of the theory of evidence law. Yet, the immense theoretical and practical difficulties in making this distinction do not make it redundant. On the contrary, it calls for further investigation.

This point leads to another lesson. Whilst the debate about the room which statistical evidence and methods should have in the courtroom is important, it should not overshadow other important debates. Much of the scholarly literature and the public media focused on the statistical evidence and the performance of the experts,

the lawyers, and the judges in relation to this evidence.<sup>94</sup> Perhaps this case indicates that the real challenge for the legal fact-finding does not lie in learning how to utilise statistical evidence and methods to yield the relative likelihood of innocent and guilt (or of unnatural and natural causes of death). The real challenge for the legal fact-finding is to return to the basic concepts of the law of evidence, such as the standards of proof and the presumption of innocence, and to investigate their theoretical meaning and practical implementation.

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<sup>94</sup> *Supra* 41-43.