

Neutral Citation Number: [2005] EWCA Crim 1980

Case Nos: 200403277, 200406902,200405573,200302848

IN THE SUPREME COURT OF JUDICATURE

COURT OF APPEAL (CRIMINAL DIVISION)

Royal Courts of Justice

Strand, London, WC2A 2LL

Date: 21/07/2005

Before:

LORD JUSTICE GAGE

Mr JUSTICE GROSS

and

Mr JUSTICE McFARLANE

Between:

R

v

Lorraine Harris

Raymond Charles Rock

Alan Barry Joseph Cherry

Michael Ian Faulder

Mr Richard Horwell and Miss Zoe Johnson for the Crown

Mr Michael Mansfield QC and Mr Peter Wilcock for Lorraine Harris and Alan Barry Joseph Cherry

Mr Michael Mansfield QC and Mr James Gregory for Raymond Charles Rock

Mr Michael Mansfield QC and Mr Robert Woodcock for Michael Ian Faulder

Hearing dates: 16 June 2005

Approved Judgment

Lord Justice Gage :

1. In these four appeals, which have been heard together, four carers, as they have been described, appeal against convictions for manslaughter, Lorraine Harris; murder, Raymond Charles Rock; manslaughter, Alan Barry Joseph Cherry; and s.20 inflicting grievous bodily harm, Michael Ian Faulder. The victims were Patrick McGuire, aged 4 months, in the case of Harris; Heidi Smith, aged 13 months, in the case of Rock; Sarah Eburne-Day, aged 21 months, in the case of Cherry; and N, aged 7 weeks, in the case of Faulder. Throughout this judgment we shall refer to the victims by their christian names and to the appellants by their surnames. Patrick was the son of Harris; Heidi was the daughter of Rock's partner; Sarah was the daughter of Cherry's partner; and N was Faulder's son. At the time immediately before each of the victims became seriously ill each was in the sole care respectively of Harris, Rock, Cherry and Faulder.
2. All of the appellants were convicted following trials. On 7 September 2000 at Nottingham Crown Court Harris was convicted of manslaughter and sentenced to 3 years imprisonment. On 21 September 1999 at Chelmsford Crown Court Rock was convicted of murder and sentenced to imprisonment for life. On 9 October 1995 at Birmingham Crown Court Cherry was convicted of manslaughter and sentenced to 2 years imprisonment. On 28 April 1999 at Teesside Crown Court Faulder was convicted of s.20 inflicting grievous bodily harm and sentenced to 30 months imprisonment.
3. The common thread running through each of these four appeals is a submission that since these convictions medical research has developed to the extent that there is now "fresh evidence" which throws doubt on the safety of each conviction.
4. Following the judgment of this Court in R v Cannings [2004] 2Cr.App.R.7 the Law Officers set up an Interdepartmental Group to review convictions of defendants in alleged "battered babies" cases. As a result of that review letters were sent to Harris and Cherry advising that each might feel it appropriate for the safety of her or his conviction to be considered further by the Court of Appeal. Each lodged notices of appeal and sought extensions of time in which to apply for

leave. Each has been granted an extension of time and leave to appeal. Rock had already lodged a notice of appeal. He appeals with the leave of the Court. In the case of Faulder his appeal comes to this Court by way of a reference from the Criminal Cases Review Commission. Mr Michael Mansfield QC is leading counsel for all four appellants. Mr Richard Horwell leads for the Crown in each appeal.

5. These appeals have involved the court receiving (by agreement of the parties) evidence from ten medical expert witnesses called on behalf of the appellants and eleven called on behalf the Crown. We also received the written evidence of four further witnesses. In general terms the issues between the two sets of medical expert witnesses are as follows. First, the evidence called on behalf of the appellants relied on recent research which it is said demonstrated that long held medical opinion of the conventional signs giving rise to inferences of unlawful assaults on infants and very young children is unreliable. The basis of this challenge was a hypothesis based on recent research. However there were also other associated medical issues. The Crown's medical witnesses do not accept that the hypothesis is correct or that it is supported by the new research.
6. Secondly the Crown do not accept that the fresh evidence in relation to other specific issues in any way renders the convictions of these appellants unsafe.

The trials

Harris

7. Harris faced a single count of manslaughter. In summary the evidence was as follows. Patrick was born on 13 August 1998. He was the son of Lorraine Harris and Sean Maguire all of whom lived in the same house with two daughters of Harris from a previous relationship. The evidence showed that, although the pregnancy was not planned, both Harris and Maguire were happy about the impending birth. After his birth, Patrick gave every indication of being a thriving and much loved baby. Maguire described Harris as being as happy as he had ever known her. Harris received support from Maguire's mother and her own mother. There were no financial difficulties and health professionals said that the family gave the impression of perfection.
8. On 4 December 1999 Harris took Patrick for his third immunisation. The rest of the day passed without any significant event. Maguire was on night shift and Harris remained in the house with Patrick. Shortly before 1.00 a.m. on 5 December 1999 Harris noticed that Patrick was having difficulty breathing and called Dr Barber, the general practitioner. Whether or not this was in evidence at the trial, it is agreed that in the telephone call Harris said to Dr Barber:

"I woke up to give him his feed and he wasn't breathing. Not until I picked him up and sort of shook him. He seems as right as rain now."

9. Dr Barber stated that on arrival Harris appeared calm and controlled. Dr Barber had formed the opinion that Harris was an experienced and sensible mother. He

- examined Patrick. Patrick's eyes were normal and he had all the appropriate reflexes. He recorded Patrick's temperature as 38.2, mildly raised. There were no signs of abuse or bruising. Patrick's chest was clear and although he was a little "snuffly" Dr Barber concluded that there was nothing wrong with him. He left the house at 1.30a.m.
10. At 2.34am Harris made a 999 call to the emergency services and reported that Patrick would not wake up. An ambulance arrived seven minutes later. The crew endeavoured to resuscitate Patrick. They recorded that Patrick did not have a pulse and was making no respiratory effort although he was still warm. Patrick and Harris were taken to Derby Children's Hospital arriving at 3.15am Patrick was put on a life support machine. The evidence was that Harris was "plainly in considerable stress and crying." Patrick was noted as having fixed and dilated pupils and retinal haemorrhages.
 11. Patrick was seen by Dr Dodd a consultant paediatrician, who examined him at approximately 4.30am He described Patrick as having widely dilated pupils enabling him to make a clear examination of the retina. He found gross preretinal haemorrhages which were so extensive that he could not recall seeing any that were worse. There were no external injuries. He was so concerned about Patrick's condition that he arranged for him to be transferred to the specialist unit at Nottingham. In Nottingham a blood sample test was taken. The test showed that there was marked hypofibrinogenemia. Despite the best efforts of the medical team caring for him Patrick died on 6 December 1999.
 12. In late March 2000 Harris was arrested and interviewed about these events. In the summing-up the judge described Harris' answers at interview as entirely consistent with the evidence which she gave at her trial.
 13. The prosecution called a number of expert medical witnesses both as to fact and also opinion evidence. Those witnesses were Dr Bouch, a Pathologist, who had conducted a post mortem on Patrick. He concluded that Patrick had died as a result of a shake which caused bleeding into the skull around the brain. He described what he meant by a "shake" as much more than rough handling. Professor Green, a paediatric pathologist, with a special interest in ophthalmic pathology gave evidence that there was extensive bleeding in the vitreous of the left eye and extensive haemorrhaging of the retina. The bleeding in the right eye was less extensive. His conclusion was that his findings were those typically seen when shaking or, shaking and an impact had occurred. A consultant haematologist, Dr Giangrande, who specialised in blood diseases, gave evidence to the effect that the low level of fibrinogen in the Patrick's blood system, in his opinion, was the result of an injury sustained by Patrick and not a pre-existing condition. However he was unable to rule out the possibility that that condition was present before the brain injury was caused. Finally, the prosecution called Mr Punt, a consultant paediatric brain surgeon. His evidence was that the amount of blood over the surface of the brain shown on the scan and the description of the amount of blood over the surface of the brain at post mortem was not sufficient to cause Patrick's death. In his opinion it was injury to the brain itself which caused death; and that the brain injury was caused either by shaking or an impact or a combination of both. In his opinion whatever caused the injury to the brain was

- likely to have been in consequence of an incident after Dr Barber had left the home at 1.30a.m. In his view it was extremely improbable that the injuries were the result of a bleeding disorder.
14. Harris, a woman of good character, gave evidence in her own defence. Her evidence was that on the evening of 4 December 1998 Patrick became "chesty and grunty". Because he had difficulty in breathing she called out Dr Barber. After his visit she put Patrick in his cot. He seemed to have settled a bit. When she awoke approximately an hour later she checked him. His arms were on the top of the covers; he was a bit pale and cold. When she picked him up he was floppy. She said that she panicked and put him down in the cot. She telephoned her mother and then the ambulance. She vaguely remembered bouncing him on her knee whilst she was on the telephone. At interview she had said that she had Patrick on her knee when she telephoned the ambulance and that she remembered her knees "were going ten to the dozen." In evidence she said that she found it difficult to remember the sequence of events because she had tried to put it out of her mind. She accepted that she had told the doctor on the telephone that Patrick had stopped breathing in order to make him hurry. She said she was unable to offer any explanation for his injuries.
 15. On her behalf three expert medical witnesses gave evidence. They were Dr Batman, a consultant histopathologist; Dr Jones, a consultant paediatrician; and Dr Macdonald, a consultant neuropathologist. Dr Batman thought that there were three possible causes of Patrick's death. They were (a) natural causes such as bleeding from a blood disorder; (b) shaking with or without impact; and (c) re-bleeding of an old blood clot. He regarded the latter as the least likely of three. In evidence, Dr Jones stated that his conclusion was that the findings were entirely consistent with a bleeding disorder. However he conceded that one would have expected more blood than was present if there was a blood disorder. He accepted that the findings were consistent with Patrick having been shaken and he agreed that he had never seen a child with fibrinogen deficiency which had died. Dr Macdonald concluded that Patrick's injuries were not the result of a severe non-accidental injury although he conceded that the extent of the haemorrhages inside the vitreous jelly of his eye equated to a quite severe shaking. But the fact that there was no bleeding on the optic nerve of the right eye was a contra-indication.
 16. In a summing-up, about which there is and can be no criticism, the judge described the issue for the jury as follows:

"The prosecution assert that she killed Patrick by deliberately shaking him violently or by shaking him violently and then throwing him down in his cot so as to cause bleeding inside his skull, thus leading to his collapse and death. The defendant denies that she did any such thing. She cannot explain her son's collapse and death, but maintains that she did nothing which might have brought about that death. If you are not sure that the defendant killed Patrick, then you find her not guilty"

After deliberating for just short of three hours the jury returned a verdict of guilty of manslaughter.

Rock

17. Rock faced an indictment charging him with the murder of Heidi Smith. Heidi Jane Smith was born on 10 May 1997 and was the daughter of Lisa Hudson and James Smith. Lisa Hudson's relationship with James Smith did not last long and by March 1998 she was living at the home of Rock. Rock was aged 26 and had previously been married with two children of his own. His children lived with their mother.
18. The evidence was that Heidi was a happy, healthy baby and hardly ever cried. In general Rock was very good with and doted on Heidi. There was evidence that he was concerned about her well-being and showed no hostility towards her. However, Lisa Hudson said in evidence that Rock had a temper. She spoke of an incident about two weeks before Heidi's death when Heidi was grizzly and would not settle. She said that on that occasion Rock held Heidi to his face and said "shut up" in what she thought was a nasty fashion. On another occasion Rock complained that "Its Heidi this and Heidi that".
19. On 2 June 1998, Lisa's mother, Thelma Hudson, was looking after Heidi. At 6.30pm Thelma took Heidi back to Rock's home after he had returned from work. Lisa Hudson was still at work. Thelma Hudson placed Heidi in her cot at 6.35pm. She said that when she left Heidi was asleep and breathing normally. At 7.08pm Thelma Hudson telephoned Rock and spoke to him. From approximately 7.00pm Lisa Hudson could not get a response from the telephone at Rock's home. A next door neighbour, Gail Banham, said that some time between 7.05pm and 7.10pm, from her kitchen, she could hear screaming coming from one of the homes at the back of her house. She said that the screaming sounded like a very sustained temper tantrum of a child aged between nine months to eighteen months. She also heard someone shouting at the child. It was a male and youngish. He was swearing and told the child to "fucking shut up". The screaming did not stop. She went to the front of her house where she could hear nothing but then returned to her back kitchen. The screaming continued and she heard the same voice telling the child to shut up. The screaming continued but as she finished dishing up a meal it stopped and went completely silent. Her evidence was that this occurred at 7.20pm. In the unused material there were statements from police officers concerning an experiment conducted by them to see if shouting in one house could be heard in the other. The result of this experiment was inconclusive.
20. However, Rock, in evidence, agreed that he had told Heidi to shut up but it was in the context of a longer sentence in which he said "you heard your mum, you've got to shut up". He said that after Thelma Hudson had telephoned him he checked that Heidi was asleep and went downstairs to watch a video. During this time he heard loud crying. He went upstairs and found Heidi sitting up in her cot, red-faced and very upset. He said that he picked her up by her armpits and placed her in the crook of his right arm with his left hand under her bottom. He then rocked her from side to side at the same time trying to wind up the mobile on the top of the wardrobe. Heidi slipped through his arms onto the floor. He said that he saw Heidi hit the floor; she did not bang her head but did not stop crying. He immediately picked her up. She was completely still and not breathing. He patted

her on the back saying "come on Heidi sweetheart". He then held her in front of him but did not violently shake her. He shook her lightly by placing her on the floor where she was having the occasional spasm. He tried to give her mouth to mouth resuscitation but on the fourth occasion she began to vomit. He took her to the bathroom, held her face down over the sink and banged her back to allow the sick to come out. His evidence was that she began vomiting again. Seeing this he ran downstairs with Heidi and dialled 999. His telephone call was timed at 7.27pm. The paramedics arrived at 7.37pm. They found Heidi lying on the floor in a dimly lit room. Rock told them that he had dropped Heidi onto her bottom whilst he had been trying to wind up a clockwork toy. He told them that Heidi had not hit her head on the floor as he had been able to catch and support her head before it hit the floor. He then picked her up and she had gone limp and stopped breathing. He told them that he had tried mouth-to-mouth resuscitation and Heidi had vomited. One of the paramedics saw signs of vomit around Heidi's mouth. He said that on the way to the hospital in the ambulance Rock had asked questions such as "has she got brain damage?" "Has she got lung damage?" On arrival at the hospital Heidi was taken straight to the resuscitation room. She was subsequently transferred to the Intensive Treatment Unit as she was having spasmodic fits; both her eyes were rolling to the left; she was pale but breathing and unconscious.

21. At the hospital, Rock gave an account of events to both Lisa and Thelma Hudson and all of the medical staff. His explanation of the incident was much the same as that which he gave in evidence. He maintained that Heidi did not bang her head when she fell and he told no one that he had shaken her. To Lisa Hudson he said "I am so sorry, I dropped her on her bum". And later in the hospital chapel, "I killed her, I killed her. Please God let her live, save her."
22. The prosecution called a number of medical witnesses including expert witnesses. A consultant ophthalmic surgeon said that he examined Heidi's eyes when she was comatose and on a ventilator. He found massive retinal haemorrhaging at all layers on both retinas. There was also tenting/pulling forward of the major retinal vessels or folds. He concluded that in the absence of any specific medical condition the haemorrhages and tenting were the result of severe acceleration and deceleration forces. He said that he had never seen such severe damage to a person's retina. Dr Jaspan, a consultant neuroradiologist (one of the expert witnesses called by the Crown in these appeals) examined a CT scan taken at 10.25pm on 2 June 1997. He found a thin layer of blood lying along the falx and within the brain at the back of the head. In his opinion these findings were consistent with trauma. In his view the disrupted delicate blood vessels in the brain had been damaged and the damage was profound and irreversible. He concluded that the trauma was so severe as to render Heidi immediately unconscious and that the injuries were highly characteristic of violent shaking. In his opinion dropping a child on its bottom was inconsistent with Heidi's injuries.
23. Mr Jonathan Punt, a consultant paediatric neurosurgeon, also examined the first CT scan of 2 June and agreed with Dr Jaspan's conclusions. He concluded that the degree of violence required to cause the injuries to Heidi was "extreme; grossly in excess of any vigorous handling, even rough handling."

24. Dr Cary, a pathologist, conducted the post mortem on the same day as the life support machine had been discontinued. He found a number of superficial bruises over Heidi's body. In addition there was bruising within the scalp over the back of head and bleeding around the optic nerve. The brain was swollen and there was bleeding on the surface of the brain. There was no skull fracture. He said that in his opinion the head injuries in conjunction with the retinal detachment in both eyes were consistent with shaken baby syndrome (SBS). In his view the cause was shaking or shaking plus an impact which caused injuries to the brain. He said that the force required was "shaking as hard as you can". Further, he concluded that the changes which had occurred to Heidi's eyes meant that there must have been several shakes back and forth with acceleration and deceleration.
25. A professor of forensic pathology, Professor Michael Green, gave evidence that there were haemorrhages around both optic nerve roots and that the retina had started to pull away. There was a detachment between the sclera and the retina and extensive bleeding around the optic nerve. In his view the injuries were typical of a serious shaking plus impact.
26. Finally, Dr Christine Smith, a consultant neuropathologist, called by the prosecution, described the brain as swollen and said that she had found on the inner surface of the dura remnants of blood. There was also widespread damage to nerve cells. She concluded that the injuries to the brain were consistent with trauma which had caused the brain to move in relation to the skull. She said that the most likely cause of the haemorrhaging to the eyes was shaking. She said there was no evidence of natural diseases present which could have led to Heidi's death.
27. Rock gave evidence in his own defence. We have already referred to his version as to how he came to drop Heidi on the floor. He denied shaking Heidi but accepted that as a father he knew the consequences of shaking a baby could be fatal. He accepted in cross-examination that he had not told the doctors or the police that Heidi had become floppy after he had shaken her. He said that feelings of guilt were the reason for him not telling the police. He confessed that at the hospital it was obvious to him that Heidi was suffering from brain damage but he did not tell the doctors about shaking Heidi.
28. No expert witnesses were called on Rock's behalf.
29. In his summing-up the judge told the jury that Rock admitted shaking Heidi. He said:

"It is for you to say, but you may think that, in the end, the defendant was bound to admit that he had shaken Heidi, and shaken her before she became floppy, because the evidence that she was shaken is so strong, so overwhelming. How else were those injuries caused to Heidi, if it were not by the defendant shaking her, and shaking her with considerably excessive force? That is a question you are entitled to ask yourself, obviously. There is no question of accident here. It is not suggested that what the defendant did was done otherwise than deliberately."

30. The judge went on to direct the jury that the difference between murder and manslaughter was one of intention. Further, he told them that there was a third possible verdict and that was not guilty of anything. He continued:

"So, I must leave it open for you to say whether the defendant is not guilty of anything. I am allowed, however, to suggest to you that not guilty of anything is not a realistic verdict in this case. As I say, you decide this case. If you think that the defendant's account that he did not shake Heidi violently so as to cause those injuries to Heidi from which she died, that his account is true or may be true, then he is entitled to be acquitted both of murder and manslaughter."

After deliberating for a period of forty minutes the jury returned a verdict of guilty of murder.

Cherry

31. Cherry faced an indictment charging him with the manslaughter of his partner's daughter Sarah. Sarah's mother, Mrs Shirley Eburne-Day, and her children including Sarah and Cherry, at the time of the incident giving rise to the charge, were all living together at Mrs Eburne-Day's home. Sarah was the youngest of Mrs Eburne-Day's three children. Mrs Eburne-Day and Cherry had lived together for some months. The evidence suggested that he was a good step-father to the children. On Thursday, 3 February 1994, in the morning, Sarah was left in the sole care of Cherry. Earlier in the week she had developed a thumb infection for which a doctor had prescribed antibiotics. After taking some medicine on 2 February Sarah was sick so different antibiotics were prescribed.
32. On the morning of 3 February 1994, at about 8.30am, Mrs Eburne-Day left Sarah at home with Cherry whilst she drove her two older children and a neighbour's daughter to school. The plan was that Cherry would take Sarah to Mrs Eburne-Day's father's home where, in the course of the morning, Cherry and Mrs Eburne-Day would meet before both went to Birmingham for Cherry to attend a job interview.
33. That morning Sarah was a little better than on the previous day and appeared to be behaving perfectly ordinarily. Mrs Eburne-Day said that she had no concerns about leaving her. She said that she and Cherry had discussed Sarah's health and decided that she was fit enough to be left with her grandparents. In evidence, Cherry said that he disagreed. He said that Sarah was not very well on Thursday morning. She was not in a bright condition and wanted to sleep and be cuddled by her mother. He denied that he had any conversation with Mrs Eburne-Day about Sarah's health that morning.
34. Lianne Osbourne, a next door neighbour, called that morning for a lift to school. Before leaving with Mrs Eburne-Day she said that she saw Cherry briefly. He was wearing dark trousers, a white striped shirt and a red brown paisley patterned tie. Apart from his jacket he appeared almost ready to go out. In evidence Cherry denied that when seen by Lianne Osbourne he had been fully dressed for work.

35. There was evidence that Cherry was next seen in the street in a distressed state seeking assistance from various neighbours. Sarah's grandfather, Mr Eburne-Day, received a telephone call from Cherry at precisely 8.55am asking him to call an ambulance, which he did. Mrs Redding, a neighbour and trained nurse, saw Sarah just before the ambulance arrived. She said that Sarah appeared to be dead or on the verge of death. She applied resuscitation techniques until the ambulance arrived at approximately 9.20am. Sarah was taken first to George Eliot Hospital in Nuneaton but was later transferred to the Intensive Therapy Unit at Birmingham Children's Hospital. In spite of all medical efforts Sarah died about 48 hours later.
36. On 4 February 1994 Cherry was arrested on suspicion of causing grievous bodily harm with intent. This was before Sarah had been pronounced dead. He was interviewed by police and explained that he had left Sarah standing on a small yellow chair whilst he went upstairs briefly to put on a shirt and tie. Apparently, it had been Sarah's habit to stand on the yellow chair in order to look out of the window at the front of the house. He explained that when he returned he found Sarah lying on the floor motionless and making gurgling noises. He said that he picked her up and described her body feeling like a rag doll. She did not respond and therefore he telephoned her grandfather to ask him to telephone for an ambulance. He explained that she must have become suddenly ill and fallen from the chair. He denied shaking her or throwing her around but said that she had fallen out of her sister's bed at the weekend. On 6 February 1994 he was charged with the murder of Sarah and after caution replied "I'm not guilty. I've committed no offence". In the event, the Crown proceeded with a charge of manslaughter rather than murder.
37. At trial, giving evidence in his own defence, Cherry repeated what he had said at interview. He said that after going upstairs to finish off dressing for "only a few minutes" he returned to find Sarah "lying on the floor, obviously badly injured." He said that when he picked Sarah up and tried to pat her back he removed "some yellow stuff from her mouth".
38. At trial the prosecution called a number of medical witnesses. Doctor (now Professor) Whitwell conducted the post mortem upon Sarah. Her finding was that death had been caused by "cerebral swelling and subdural haematoma". In addition, she found two bruises at the back of the head (3.5cms and 1.5cms in diameter and on opposite sides) and five small areas of bruising higher up. In her opinion the five smaller bruises were consistent with pressure from fingers. In cross-examination she did not accept that the injuries could have been caused by falling from the yellow chair. She said that the injuries were more consistent with Sarah's head being forcibly put against something. In her opinion it was highly unlikely that Sarah could have injured herself by banging her head against the floor although that was not impossible. She said it was unlikely the injuries could have been caused by a single fall because there were two separate areas of impact and two separate bruises, although she could not exclude this absolutely.
39. A radiologist, Dr Chapman, stated that it was very rare for a child to have this kind of bleeding from a domestic fall. In his opinion a fall from the yellow chair had not caused Sarah's injuries. Dr Akuba, a neurological registrar, in a witness statement, said that she had inserted a tube into Sarah's skull as part of her

- treatment and recorded that "Cerebral spinal fluid emerged under moderate pressure. It was yellow and looked like old blood. Query, query".
40. Dr Rylance, a consultant paediatrician, having seen Sarah at Birmingham Children's Hospital, took the view that her injuries were non-accidental. He was asked about a previous statement which he had made and in which he stated that the injury giving rise to blood inside the skull occurred almost certainly more than 12 hours previously and probably more than 36 hours previously. He said in evidence that he had since changed his opinion and in fact it could have been 10? or 11 hours previously. He said that Sarah's vomiting the day before was more likely to have been caused by the medicine than a previous brain injury because when she stopped taking the medicine she stopped vomiting.
 41. Finally, the prosecution called Mr Flint, a surgeon, who described the five small bruises on Sarah's head which were, in his opinion, indicative of her having been held. The two bruises on the back of her head suggested at least two blows. In his opinion it was very unlikely that the bruises were caused by her slipping backwards from the chair and hitting her head on the floor. In his opinion a healthy child could not sustain such injuries revealed by the post mortem by falling the short distance from the chair onto the carpeted floor.
 42. In addition to his own evidence, there was called on Cherry's behalf a neurologist Dr West and a consultant pathologist, Dr Ackland. Dr West had viewed films taken by Dr Whitwell. He said that what he saw was consistent with a child having aspirated liquid which was a frequent complication of head injuries. Dr Ackland did not rule out the possibility of abuse causing the injuries but was of the opinion that an accidental fall from the chair was a significant possibility. In his opinion there was a small possibility that Sarah some earlier injury that was aggravated by the fall but he did not regard that as a high possibility. He said that the five marks on Sarah's head may have been caused by a firm grip during the medical treatment.
 43. In his summing-up the judge described the issue for the jury to decide in the following terms:

"The cause of her death was a swelling of the brain caused by an impact of one sort or another. It is the prosecution case that the impact was in consequence of an unlawful blow delivered by this defendant. Your task will be to decide whether that case is proved or not."

After deliberating for just over two and a half hours the jury returned a unanimous verdict of guilty of manslaughter.

Faulder

44. At trial Faulder faced an indictment containing 2 counts. They were count 1, a s.18 offence of causing grievous bodily harm with intent; and count 2 an alternative s.20 offence. He was convicted of the latter offence. The evidence showed that at 10.30pm on Friday 13 February 1998, N then aged seven weeks (but born two weeks premature) was admitted to the Dryburn Hospital with severe

- injuries. On the following day N was transferred to a specialist unit at the Newcastle General Hospital where his condition deteriorated over the following week. Although there was concern that he might not survive he recovered and was transferred back to Dryburn Hospital on 5 March 1998. On 16 March 1998 he was discharged from hospital.
45. The event which led to N's admission to hospital occurred at the home occupied by Faulder and his partner. It was common ground that at the time Faulder was the sole carer of N. His case was that N's injuries were caused entirely accidentally. He said that he had dropped N and that in falling N struck and injured his head. The case for the prosecution was that Faulder had caused the injuries by a deliberate act or actions.
 46. The prosecution case was based on the assertion that the extensive brain injuries sustained by N and revealed on x-ray and brain scans could not have been occasioned in the manner described by Faulder. The prosecution relied on the evidence of three expert witnesses for the proposition that Faulder must have shaken N and thrown him onto the floor.
 47. Dr Camille de San Lazaro at the time a consultant paediatrician at the Royal Victoria Infirmary gave evidence that the injuries sustained by N were consistent with shaking and were not consistent with Faulder's account. She said that his version of the events could not account for the subdural haemorrhages. She further stated that in relation to Faulder's account of N making a sudden arching movement which caused him to drop N that at that age the child would have had insufficient muscle tone to achieve the movement described by Faulder. Further Faulder's description of N falling onto a pushchair and then a highchair before hitting the floor would have had the effect of breaking N's fall rather than exacerbating it.
 48. Dr Alexander, a consultant paediatrician at the Newcastle General Hospital, gave evidence that on examination of N on 14 February 1998 he found a triangular bruise on the top of N's head and two bruises on the forehead over the right eye. He said that the child's fontanelle was unusually tense, symptomatic of swelling of the brain due to brain damage. In his opinion the CT scan showed bilateral subdural haemorrhages. He conceded that the superficial marks on N's face and head were consistent with Faulder's account but asserted that this account did not provide an explanation for the bruise on the right side of the forehead or the severity of the brain injuries. In his opinion the brain injuries were such as were commonly caused by repeated shaking with considerable force, and the clinical findings were more consistent with non-accidental injury than with an accident.
 49. Mr Gholkar, a consultant neuroradiologist, having examined the brain scans concluded that the evident changes in the appearance of the brain were due to severe brain damage unlikely to have been occasioned in the manner described by Faulder and were characteristic of shaking injuries.
 50. There was no evidence of retinal haemorrhages and there was some dispute as to the extent to which retinal haemorrhages were to be found in babies with "shaking" injuries. Dr de San Lazaro stated that her study showed that 53% of children believed to have been shaken, had retinal haemorrhages.

51. Faulder gave evidence in his own defence. He said that he did not deliberately cause the injuries. He explained how he had dropped N by accident when attempting to place him into his pushchair. He said that he had been holding him along his arm with his hand supporting the baby's head. The baby moved suddenly and fell on to the edge of the pushchair. This caused him to bounce off the pushchair and on to the concrete floor bouncing his head on the adjacent highchair as he fell. Faulder conceded that the baby had been crying for twenty minutes but said that he had not lost his temper. He maintained that he did not shake nor forcibly place N into his pushchair. His answers at interview were consistent with his evidence at trial.
52. Dr Rushton a paediatric pathologist gave evidence for Faulder. He put forward the possibility that N's contact with the pushchair and highchair might have lead to the production of rotary forces that accelerated the head and increased the force of contact with the floor. He noted that the three external injuries (bruises) found on the baby's head were consistent with Faulder's explanation but were difficult to explain if the injuries were due to shaking or a single impact injury. He also referred to the lack of retinal haemorrhages saying that in his opinion the cause of retinal haemorrhages was not fully understood. In his view subdural haemorrhages could be caused by shaking or impact but they might also be consistent with injury caused in the manner described by Faulder.
53. The judge directed the jury in his summing-up that the first question for it to decide was:

"Was this or may it have been accident or design? If you come to the conclusion that this is or may have been a tragic accident it follows that the defendant cannot be guilty of count 1 or count 2 and must be acquitted by you. That is the simple issue for you to decide."

54. After deliberating for just less than two hours the jury returned a verdict of guilty of count 2.
55. On conviction Faulder applied for leave to appeal against conviction and sentence and for an extension of time. His applications were refused by the single judge.

The triad and the unified hypothesis

56. At the heart of these appeals, as they were advanced in the notices of appeal and the appellants' skeleton arguments, was a challenge to the accepted hypothesis concerning "shaken baby syndrome" (SBS); or, as we believe it should be more properly called, non-accidental head injury (NAHI). The accepted hypothesis depends on findings of a triad of intracranial injuries consisting of encephalopathy (defined as disease of the brain affecting the brain's function); subdural haemorrhages (SDH); and retinal haemorrhages (RH). For many years the coincidence of these injuries in infants (babies aged between 1 month and 2 years) has been considered to be the hallmark of NAHI. Not all three of the triad of injuries are necessary for NAHI to be diagnosed, but most doctors who gave evidence to us in support of the triad stated that no diagnosis of pure SBS (as

- contrasted with impact injuries or impact and shaking) could be made without both encephalopathy and subdural haemorrhages. Professor Carol Jenny, a paediatrician and consultant neuro-trauma specialist called by the Crown, went further and said that she would be very cautious about diagnosing SBS in the absence of retinal haemorrhages. In addition, the Crown points to two further factors of circumstantial evidence, namely that the injuries are invariably inflicted by a sole carer in the absence of any witness; and that they are followed by an inadequate history, incompatible with the severity of the injuries.
57. Between 2000 and 2004 a team of distinguished doctors led by Dr Jennian Geddes, a neuropathologist with a speciality in work with children, produced three papers setting out the results of their research into the triad. In the third paper "Geddes III", the team put forward a new hypothesis, "the unified hypothesis", which challenged the supposed infallibility of the triad. It was called the unified hypothesis because it relied on the proposal that there was one unified cause of the three intracranial injuries constituting the triad; that cause was not necessarily trauma. It is important to note that the new hypothesis did not seek to show that the triad was inconsistent with NAHI. It did, however, seek to show that it was not diagnostic.
58. When Geddes III was published it was, and still is, very controversial. It is not overstating the position to say that this paper generated a fierce debate in the medical profession, both nationally and internationally. In the course of the hearing of these appeals we have heard evidence from a number of very distinguished medical experts with a range of different specialities most of whom had in witness statements expressed views on one side or other of the debate. However, early on in the hearing it became apparent that substantial parts of the basis of the unified hypothesis could no longer stand. Dr Geddes, at the beginning of her cross-examination, accepted that the unified hypothesis was never advanced with a view to being proved in court. She said that it was meant to stimulate debate. Further, she accepted that the hypothesis might not be quite correct; or as she put it:

"I think we might not have the theory quite right. I think possibly the emphasis on hypoxia - no, I think possibly we are looking more at raised pressure being the critical event. "

And later in her evidence:

"Q. Dr Geddes, cases up and down the country are taking place where Geddes III is cited by the defence time and time again as the reason why the established theory is wrong.

A. That I am very sorry about. It is not fact; it is hypothesis but, as I have already said, so is the traditional explanation. ... I would be very unhappy to think that cases were being thrown out on the basis that my theory was fact. We asked the editor if we could have "Hypothesis Paper" put at the top and he did not, but we do use the word "hypothesis" throughout."

59. Despite these frank admissions the triad and Geddes III have been a focus of much of the medical issues in these appeals. We propose to set out the salient features of each in a little more detail. We do so not only as a backdrop to these appeals but in an effort to inform those involved in future trials as to the current accepted state of medical science, as we understand it from the evidence before us, on some of the very difficult issues which are raised in criminal and civil trials involving allegations of NAHI.

The anatomy

60. In order to explain the two hypotheses it is necessary to set out some of the anatomy involved in terms which can be understood by laymen and which from a medical viewpoint may seem somewhat simplistic. At the outset, in order to assist the reader, we attach as annexes to this judgment a glossary of medical terms (appendix A), and diagrams of the head (appendix B).

61. The brain is encased in three membranes. The one immediately surrounding the brain is the pia mater. The next one is the arachnoid. Between the pia and the arachnoid is an area known as the subarachnoid space. The third membrane, which surrounds the brain and continues down the body surrounding and protecting the spinal cord, is the dura. Between the dura and the arachnoid is the subdural space. Between the dura and the arachnoid there are veins running between the two membranes which are called bridging veins.

62. The brain is divided into two halves or cerebral hemispheres. The two hemispheres are separated by the falx which itself is part of the dura. Below the cerebral hemispheres the brain is joined to the spinal cord at the craniocervical junction, which, as its name implies, is situated in the neck. The spinal cord extends down from the brain, through the foramen magnum and into the spine.

The triad

63. As already stated when the three elements of the triad coincide for some years conventional medical opinion has been that this is diagnostic of NAHI. Typically the brain is found to be encephalopathic; bleeding is found in the subdural space between the dura and the arachnoid subdural haemorrhages; and there are retinal haemorrhages. There may also be other pathological signs such as subarachnoid bleeding and injuries at the cranio-cervical junction. Further, there may be injuries to nerve tissue (axonal injuries) and external signs of broken bones, bruising and other obvious injuries such as extradural oedema (bruising). Determining these findings requires medical experts from a number of different disciplines interpreting often very small signs within the complex structures of an infant's brain and surrounding tissue.

64. The mechanism for these injuries is said to be the shaking of the infant, with or without impact on a solid surface, which moves the brain within the skull damaging the brain and shearing the bridging veins between the dura and the arachnoid. The shaking may also cause retinal haemorrhages. In the sense that the explanation for the triad is said to be caused by shaking and/or impact it also is a

unified hypothesis, albeit that each element is said to be caused individually by trauma.

65. The triad of injuries becomes central to a diagnosis of NAHI when there are no other signs or symptoms of trauma such as bruises or fractures.

The unified hypothesis ("Geddes III")

66. Dr Geddes and her colleagues, following research into almost fifty paediatric cases without head injury, proposed that the same triad of injuries could be caused by severe hypoxia (lack of oxygen in the tissues) which in turn led to brain swelling. The hypothesis was that brain swelling combined with raised intracranial pressure (ICP) could cause both subdural haemorrhages and retinal haemorrhages. Thus, it was argued that any incidents of apnoea (cessation of breathing) could set in motion a cascade of events which could cause the same injuries as seen in the triad. It will be appreciated that there are many events which could accidentally cause an episode of apnoea.
67. In Geddes III the unified hypothesis was summarised as follows:

"Our observations in the present series indicate that, in the immature brain, hypoxia both alone and in combination with infection is sufficient to activate the pathophysiological cascade which culminates in altered vascular permeability and extravasation of blood within and under the dura. In the presence of brain swelling and raised intracranial pressure, vascular fragility and bleeding would be exacerbated by additional hemodynamic forces such as venous hypertension, and the effects of both sustained systemic arterial hypertension and episodic surges in blood pressure. "

Thus, it was suggested that all the injuries constituting the triad could be attributed to a cause other than NAHI. We understand that this paper has been much cited in both criminal and civil trials since its publication.

68. The criticism of Geddes III is that it is not hypoxia and/or brain swelling which causes subdural haemorrhages and retinal haemorrhages but trauma. As an example of why the hypothesis is not correct Dr Jaspan, giving evidence in the appeal of Rock, demonstrated that CT scans taken of Heidi's brain showed that there was little or no brain swelling at a time when subdural haemorrhages and retinal haemorrhages were shown to be present. As a result of critical papers published in the medical journals, as we have already stated, Dr Geddes when cross-examined frankly admitted that the unified hypothesis could no longer credibly be put forward. In cross-examination she accepted that she could no longer support the hypothesis that brain swelling was the cause of subdural haemorrhages and retinal haemorrhages. She did, however, state that she believed that raised intracranial pressure (ICP) might prove to be an independent cause of both lesions. When asked by Mr Horwell if she had published a paper on

- this hypothesis she said that she had not and that her research was still incomplete. It was clear from subsequent questions in cross-examination that this work was still in its early stages and that many questions remain, as yet, unresolved.
69. In our judgment, it follows that the unified hypothesis can no longer be regarded as a credible or alternative cause of the triad of injuries. This conclusion, however, is not determinative of the four appeals before us. There are many other medical issues involved in cases of alleged NAHI. Further, there remains a body of medical opinion which does not accept that the triad is an infallible tool for diagnosis. This body of opinion, whilst recognising that the triad is consistent with NAHI, cautions against its use as a certain diagnosis in the absence of other evidence. These four appeals raise different medical issues and do not necessarily fail because the unified hypothesis has not been validated. But it does mean that the triad, itself a hypothesis, has not been undermined in the way envisaged by the authors of *Geddes III*.
 70. Mr Horwell, in his final submissions invited the Court to find that the triad was proved as a fact and not just a hypothesis. On the evidence before us we do not think it possible for us to do so. Whilst a strong pointer to NAHI on its own we do not think it possible to find that it must automatically and necessarily lead to a diagnosis of NAHI. All the circumstances, including the clinical picture, must be taken into account. In any event, on general issues of this nature, where there is a genuine difference between two reputable medical opinions, in our judgment, the Court of Criminal Appeal will not usually be the appropriate forum for these issues to be resolved. The focus of this Court will be (as ours has been) to decide the safety of the conviction bearing in mind the test in fresh evidence appeals which we set out below. That is not to say that such differences cannot be resolved at trial. At trial, when such issues arise, it will be for the jury (in a criminal trial) and the judge (in a civil trial) to resolve them as issues of fact on all the available evidence in the case (see *R v Kai-Whitewind* [2005] EWCA 1092).
 71. Before we leave *Geddes III* we must mention some evidence given by the first witness we heard, Dr Waney Squier, a consultant neuropathologist, which was the subject of some further investigation by the Crown's witnesses and further oral evidence. Dr Squier produced a slide taken from the brain of a four week old baby which she said demonstrated blood oozing from the dura into the subdural space. In her opinion this showed that intradural haemorrhages could leak into the subdural space and could be mistaken for subdural haemorrhages caused by shearing of the bridging veins. In that respect it challenged the diagnostic value placed on subdural haemorrhages by the triad. Mr Horwell asked for the slide and other slides made in respect of the same brain to be released for examination by the Crown's experts. We heard evidence in respect of this discrete issue on the last day of evidence.
 72. In summary, two paediatric neuropathologists, Dr Rorke-Adams and Dr Harding, said that the slide did not show intradural bleeding but was an example of the process of organisation of an earlier subdural haemorrhage.
 73. It is unnecessary for us to go into the detail of this dispute. It is sufficient to say that having heard both sides forcefully express their views we are unable to

resolve this issue and find, as Mr Horwell invited us to, that Dr Squier's evidence on it cannot be accepted. We content ourselves with the observation that even on the interpretation of objective evidence there can be two views expressed by highly experienced and distinguished medical experts.

Geddes I and II

74. Although, for the reasons already explained, the unified hypothesis can no longer stand as a credible alternative to the triad, a number of issues of general importance in respect of the triad remain. So far we have made no mention of the first two papers produced by Dr Geddes and her co-authors, which we will refer to as Geddes I and Geddes II. These papers represent conclusions reached in respect of research into a cohort of infants all of whom died from inflicted head injuries. Using a technique pioneered by Dr Geddes, the authors sought to identify axonal damage (damage to the nerve tissues) in the brains of these infants. The technique involved detecting the presence of beta-amyloid precursor protein (β -APP) (a protein that builds up where axons have been damaged). The research showed that widespread axonal damage, interpreted as vascular rather than traumatic, was present in 13 of the 37 cases. Conversely, widespread traumatic axonal damage was found in only 2 cases and in both cases there were other very clear signs of trauma (for example bilateral skull fractures). The authors concluded that their findings strongly suggested that severe traumatic axonal damage is a rarity in infant NAHI unless there is considerable impact, and that the diffuse brain damage which was responsible for loss of consciousness in the majority of cases was caused by starvation of oxygen (hypoxic) rather than direct trauma to the brain.
75. The principle conclusion of Geddes II was that shaking an infant might cause a stretching injury at the cranio-cervical junction to nerves which control the child's cardio-respiratory system. In all the cases analysed the stretch injury itself was survivable, what was life-threatening was the consequent hypoxic injury and brain swelling that followed as a result of the damaged cardio-respiratory nerves failing to function. The minimum degree of shaking force required to produce such a stretch injury is unknown and a death may be caused in the manner suggested by much less force than hitherto supposed. Although the results of this research, as we understand it, are not challenged by those who criticise the unified hypothesis, Mr Horwell submitted that its effect was limited. For instance he submitted that it had no application to, and could not explain, cases involving subdural bleeding and/or retinal haemorrhages.

Degree of force

76. This leads on to a very important issue which arises in these appeals and will no doubt arise in many cases where the triad of injuries are present. It is the question of how much force is necessary to cause those injuries. There is a measure of common ground between the doctors on this issue. Generally it is agreed that there is no scientific method of correlating the amount of force used and the

severity of the damage caused. To state the obvious, it is not possible to carry out experiments on living children. Further, experience shows that the human frame reacts differently in different infants to the same degree of force. However the medical opinion on this issue appears to be divided into those who maintain that severe injuries can confidently be ascribed to a traumatic cause, for example (but not only) Dr Rorke-Adams, a very experienced paediatric neuropathologist, and those who maintain that very little force may cause very serious injuries, for example Dr John Plunkett, a distinguished anatomical, clinical and forensic pathologist.

77. It is quite impossible for this court to make any finding on this issue beyond referring to some general propositions with which both counsel agreed. First, common sense suggests that the more severe the injuries the more probable they will have been caused by greater force than mere "rough handling". We note that the most recent Update from the Ophthalmology Child Abuse Working Party; Royal College of Ophthalmologists (2004) concludes:

" It is highly unlikely that the forces required to produce retinal haemorrhage in a child less than 2 years of age would be generated by a reasonable person during the course of (even rough) play or an attempt to arouse a sleeping or apparently unconscious child."

78. Secondly, as Mr Peter Richards, a very experienced neurosurgeon with a speciality in paediatrics, pointed out, if rough handling of an infant or something less than rough handling, commonly caused the sort of injuries which resulted in death, the hospitals would be full of such cases. In our view this points to the fact that cases of serious injuries caused by very minor force such as might occur in normal handling or rough handling of an infant, are likely to be rare or even extremely rare.
79. But, thirdly, as Dr Plunkett demonstrated by his research and in particular by reference to an amateur video of a child falling from a 3 foot high railing, described as part of a play tree-house, which resulted in catastrophic injuries, there will be cases where a small degree of force or a minor fall will cause very severe injuries. We shall have more to say about Dr Plunkett's research later in this judgment, but at this stage we repeat that the evidence suggests that cases where this occurs are likely to be very rare.
80. Fourthly, although the younger the infant or child, the more vulnerable it is likely to be, it is not possible to conclude that age is necessarily a factor in deciding whether injuries are caused by strong force or a minimal degree of force or impact. The balance of the evidence is that, although an infant's skull is more pliable than that of an older child, the internal organs and vessels are as robust as those of an older child. The vulnerability of an infant arises from the fact that its head is generally larger in proportion to its body than in an older child and its neck muscles are weaker and not as well developed as in older children, hence the significance of injuries at the site of the craniocervical junction.

Biomechanics

81. In simple terms "biomechanics" is the application of traditional engineering principles to living organisms.
82. Many of the experts who gave evidence before us made reference to research in the field of biomechanics. The following extracts from the evidence demonstrate how the 'biomechanics' argument was deployed by both sides.
83. Dr Squier referred to the "huge amount of evidence about the biomechanics" of shaking which had caused her to revise her views on the diagnosis of shaking.
84. Dr Geddes stated that belief that thin film subdural haemorrhages were caused by the rupture of bridging veins was "biomechanically exceptionally unlikely". She relied upon biomechanical research to support the view that shaking on its own cannot cause subdural haemorrhages and retinal haemorrhages without also significant structural damage to the neck and probably also a degree of axonal injury.
85. Dr Plunkett stressed the importance of understanding the mechanics of injury.
86. Dr Adams, referring to biomechanical research by Ommaya, considered that shaking was an improbable direct cause of retinal haemorrhage.
87. Mr Richards warned that, however good the biomechanical calculations may be, they do not always appear to give an answer that is common sense. He went on to stress that limits of current knowledge and understanding:

"Nobody really knows whether, when you shake a child, it is just back and forth or there is rotation as well. What does the head do? Does it decelerate against the back? Does it decelerate against the chin? When you put the child down, there must be an element of deceleration. It is a complex problem."

88. Of course none of the witnesses who gave evidence in the appeal was themselves an expert in biomechanics. Such were the number of references to biomechanics during the early days of the hearing that it became inevitable that some direct expert evidence on the subject was required. To that end the appellants filed a report by Dr Thibault and the Crown filed a report by Dr Gina Bertocci (dealing specifically with the case of Cherry). Because of the logistics involved, not least the constraints of time, it was not possible for either of these witnesses to give oral evidence. Consequently we are left to evaluate this important area by comparing and contrasting the views expressed on paper by Dr Thibault and Dr Bertocci.
89. Dr Thibault is a biomechanical engineer whose work has a particular emphasis on "Paediatric Head Injury Mechanics". Dr Thibault is not a doctor of medicine and holds a PhD in mechanical engineering. He has apparently performed experiments that have sought to mirror the age-dependant mechanical behaviour of the infant skull, sutures and brain. Part of the work in this field is to determine the amount of physical force that a living system can tolerate and thereby identify the "injury threshold" or "injury tolerance criteria". When the relevant threshold or criteria is exceeded the system or tissue will fail; for example stress on a bone will cause the bone to fracture if the stress exceeds the injury threshold.

90. Dr Thibault explained that whereas there is a substantial body of research into the mechanics of adult head injury, until recently there has been relatively little similar work in relation to paediatric head injury. He reported:

"It has been demonstrated experimentally and validated through real-world accident analysis that various intracranial pathologies result from excessive angular acceleration of the head. In general, angular acceleration of the head creates relative motion between the brain and the skull, causing potentially injurious strain within the intracranial neural and vascular tissues (bridging vessels, deep central white matter). The nature, distribution and severity of the resulting pathology depend not only on the angular acceleration magnitude, but also on its direction, onset rate and duration."

91. Like Dr Plunkett, Dr Thibault (relying on the research of Prange and others) drew attention to the ability of the skull of an infant to react to force by deforming itself and thereby causing internal injury to the brain substance and/or cranial vascular system.

92. In general terms, Dr Thibault joined issue with the conventional view that short falls are a frequent occurrence for young children and serious or fatal injuries from such falls are rare. Recourse is also typically made to information about high speed traffic accidents or falls from two storey buildings. Dr Thibault considered such an approach to be simply "arbitrary, unscientific and meaningless" in that there is no attempt to evaluate the actual loads and forces at play in each individual case, which would need to include data regarding the child's orientation at impact, kinematics (motion) of the body, impact surface and anatomical impact locations. Dr Thibault is clear that impacts arising from falls can result in serious and fatal brain injuries.

93. The appellants rely upon the report of Dr Thibault for the following submissions:

- a. Shaking only could not produce the documented pathologies seen in these children;
- b. If "violent shaking" of the sort required to produce the documented injuries had taken place one would have expected cervico-medullary injury, cervical spine and spinal cord injury.

94. The Crown's expert, Dr Bertocci, is also a mechanical engineer by training and is Associate Professor of Biomechanics and Director of the Injury Risk Assessment and Prevention Laboratory in the University of Louisville, Kentucky, USA. Her primary area of research is injury biomechanics in cases of child abuse and paediatric falls. Dr Bertocci's report is very largely focussed upon the Cherry case and is not intended to be a comprehensive analysis of the biomechanical factors in play in each of these cases.

95. One general observation that Dr Bertocci, however, made is based upon her research into falls either from ground level or from 9 inches above ground. Her conclusion in this regard is that the forces involved in such falls are well below the threshold said to be required to produce diffuse axonal injury in an infant, suggesting that there is a very low risk of DAI in such falls.

96. In this section of our judgment we have done no more than summarise this evidence. Where such evidence is called by one or other party or both in future litigation it will be for the jury (in a criminal trial) or the judge (in a civil trial) to evaluate it in the light of the cross-examination and all the other evidence.

Retinal haemorrhages

97. Retinal haemorrhage is the third limb of the triad. It will be recalled that Professor Carol Jenny told us that in her view in a case of pure shaking extreme caution should be exercised before a diagnosis of NAHI is made in the absence of retinal haemorrhage. We see the force of this evidence. In cases of injuries alleged to have been caused by an impact or impacts, the evidence suggests that it is not a prerequisite for retinal haemorrhages to be found. Again, we understand the logic of this proposition.

98. It is agreed between the expert ophthalmologists and ophthalmic surgeons that a rapid rise in intracranial pressure can cause retinal haemorrhages although the amount and type of pressure required to cause such haemorrhages is a matter of debate. The appellants' expert ophthalmic surgeon, Dr Gillian Adams, said that retinal haemorrhages could be caused by a spike or surge of venous pressure. Mr Peter Richards said that in his experience of carrying out brain surgery artificially induced very high venous pressure did not cause retinal haemorrhages.

99. Some of the ophthalmic experts stated that retinal haemorrhages caused by shaking or impact demonstrate entirely different characteristics from retinal haemorrhages arising from other causes. Others said that no distinction can be made between retinal haemorrhages arising from different causes.

100. Again, in the context of these appeals, we make no findings in respect of these differences of opinion. In future cases before a criminal or civil court, the type and extent of retinal haemorrhage and its place in the constellations of symptoms will be a matter for the court to evaluate in each individual case. We bear them in mind when reaching our conclusions in these four appeals. We also bear in mind Mr Horwell's submission that the real question in these appeals is how much force is necessary to cause not just one element of the triad but all three.

The Law

101. The principles on which this Court should act in appeals involving fresh evidence are not in dispute. They were clearly set out in *R v Pendleton* [2002] 1Cr App. R. 441 by Lord Bingham of Cornhill (see in particular paragraphs 18 and 19). They were repeated by Lord Brown of Heaton-under-Heywood in a recent case in the Privy Council: *Dial and another v State of Trinidad and Tobago* [2005] 1WLR 1660. Lord Brown said (see paragraphs 31 and 32):

"31 In the board's view the law is now clearly established and can be simply stated as follows. Where fresh evidence is adduced on a criminal appeal it is for the Court of Appeal, assuming always that it accepts it, to evaluate its importance

in the context of the remainder of the evidence in the case. If the court concludes that the fresh evidence raises no reasonable doubt as to the guilt of the accused it will dismiss the appeal. The primary question is for the court itself and is not what effect the fresh evidence would have had on the mind of the jury. That said, if the court regards the case as a difficult one, it may find it helpful to test its view "by asking whether the evidence, if given at the trial, might reasonably have affected the decision of the trial jury to convict": R v Pendleton[2002] 1 WLR 72, 83, para 19. The guiding principle nevertheless remains that stated by Viscount Dilhorne in Staffords case [1974] AC 878, 906, and affirmed by the House in R v Pendleton:

"While ... the Court of Appeal and this House may find it a convenient approach to consider what a jury might have done if they had heard the fresh evidence, the ultimate responsibility rest with them and them alone for deciding the question [whether or not the verdict is unsafe]"

32 That is the principle correctly and consistently applied nowadays by the criminal division of the Court of Appeal in England see, for example, R v Hakala [2002] EWCA Crim 730, R v Hanratty, decd [2002] 3 ALL ER 534 and R v Ishtiaq Ahmed [2002] EWCA Crim 2781. It was neatly expressed by Judge LJ in R v Hakala, at para 11, thus:

"However the safety of the appellant's conviction is examined, the essential question, and ultimately the only question for this court, is whether, in the light of the fresh evidence, the convictions are unsafe."

102. Mr Mansfield QC also drew our attention to passages in the judgments of this court in R v Cannings [2004] 2Cr. App. R.7 and R v Kai-Whitewind [2005] EWCA 1092. In particular in opening he referred to paragraph 22 of Cannings:

"These observations serve to highlight the second problem which can arise in this case, and case like Sally Clark and Trupti Patel. We have read bundles of reports from numerous experts of great distinction in this field, together with transcripts of their evidence. If we have derived an overwhelming and abiding impression from studying this material, it is that a great deal about death in infancy, and its causes, remain as yet unknown and undiscovered. That impression is confirmed by counsel on both sides. Much work by dedicated men and women is devoted to this problem. No doubt one urgent objective is to reduce to an irreducible minimum the tragic waste of life and consequent life-scarring grief suffered by parents. In the process however much will also be learned about those deaths which are not natural, and are indeed the consequence of harmful parental activity. We cannot avoid the thought that some of the honest views expressed with reasonable confidence in the present case (on both sides of the argument) will have to be revised in years to come, when the fruits of continuing medical research, both here and internationally, become available. What may be

unexplained today may be perfectly well understood tomorrow. Until then, any tendency to dogmatise should be met with an answering challenge".

But as the court was careful to point out later in the judgment at paragraph 178 this does not mean that fanciful doubts are a basis for rejecting expert evidence. With the general observations, referred to above and the legal principles in mind, we turn to the individual appeals. Furthermore, the limits of *Cannings* and its proper use were carefully explored in *Kai-Whitewind*, at [73] [92], in observations with which we wholeheartedly agree.

Harris

103. Mr Mansfield QC submits that there is a body of fresh evidence which is sufficient to cause this court on a review to quash the conviction. Mr Horwell submits that the fresh evidence has not in any way undermined the safety of the conviction.
104. Before we outline and discuss the fresh evidence we must refer in a little more detail to the evidence given at trial. Although Harris said that Patrick had been showing signs of some infection before 4 December 1998, on that day he was seen by a health visitor, Margaret Savill, and a doctor, Dr Michael Tory, at Boulton Clinic in Alvaston both of whom pronounced him fit to be given his third immunisation against diphtheria, tetanus, whooping cough, polio and HIB. Statements of their evidence to that effect were read at trial. In his statement, Dr Tory said that a child would not be given this injection unless he was satisfied that it was not suffering from a raised temperature, vomiting or diarrhoea. A mild cold or snuffle would not have prevented the injection being given.
105. On arrival at Harris' home at 2.41am the paramedic crew noted that Patrick was unconscious, cold, not moving, pulseless and not breathing. At 2.55am the crew diagnosed that he was suffering from cardio-respiratory arrest. Dr Adams, an ophthalmic surgeon called on behalf of Harris, interpreted diagrams of the eyes made by the crew as showing that the pupils were fixed and dilated. In any event this finding was made by Dr Bertenshaw who examined Patrick at 03.15am at the Derby Children' Hospital.
106. After being transferred from Derby to the Queens Medical Centre in Nottingham a CT scan was carried out at 11.50am. The findings were recorded by the radiologist and his conclusion was:
- "Diffuse cerebral swelling and oedema secondary to hypoxia/ischaemia. Thin subdural haematoma in the para-falsine region. The appearances are suspicious of shaking or shaking - impact injury"
107. Following Patrick's death a post-mortem was carried out by Dr Bouch with Dr McKeever, a paediatric pathologist, in attendance. The findings relevant to this appeal are set out in Dr Bouch's witness statement of 22 March 1999. Paragraph 5 reads:

"The post-mortem examination confirmed a markedly swollen and softened brain and softened spinal cord with small amounts of subdural haemorrhage around the tentorium cerebelli at the foramen magnum and in the subdural space along the length of the spinal cord. Detailed examination by Professor Lowe confirmed widespread hypoxic (anoxic or ischaemic) changes within the brain resulting in marked swelling, necrosis of the cerebellum, haemorrhage into the left lateral ventricle and subarachnoid haemorrhage over the surface of the spinal chord and medulla. Professor Green confirmed extensive haemorrhages through the retina and the vitreous of both eyes with some retinal detachment"

Dr Bouch recorded the cause of death as cerebral hypoxia/ischaemia; intracranial haemorrhage; shaken baby syndrome. In his witness statement Dr Bouch said he had been advised that Patrick may have been shaken as part of an attempt to revive him. He said that he could not exclude such a shake as having caused the injuries but commented "accepted medical opinion is that the force required to produce injuries from shaking is greater than that resulting from rough handling of an infant". As already noted, Dr Punt said that the blood on the surface of the brain was not sufficient to cause Patrick's death. In his opinion it was the injury to the brain, caused by shaking, which caused his death.

The new evidence on the appeal

108. In this appeal we have heard evidence from the following witnesses called on behalf of Harris: Dr Waney Squier, a consultant neuropathologist, with a speciality in examining children's brains; Dr Jennian Geddes, although her evidence was primarily confined to general matters; Professor Philip Luthert, a consultant ophthalmic pathologist and neuropathologist; Dr Gillian Adams, a consultant ophthalmic surgeon; Professor James Morris, a consultant pathologist; Dr Robert Sunderland, a consultant paediatrician; and Dr Philip Anslow, a consultant neuroradiologist.
109. The Crown called the following witnesses: Dr Lucy Rorke-Adams, a consultant paediatric neuropathologist; Mr Peter Richards, a consultant neurosurgeon; Dr Richard Bonshek, a consultant ophthalmic pathologist; Mr R Gregson, a consultant ophthalmic surgeon; Dr William Lawler, a forensic pathologist; Dr Carole Jenny, a consultant paediatrician and consultant neuro trauma specialist; Professor Klein, a consultant physician; Dr Timothy Jaspán, a consultant radiologist; Dr Paul Giangrande, a consultant haematologist; and Dr Mark Peters, a consultant paediatric intensivist. We have also read statements submitted from the following experts on behalf of the Crown: Dr Harish Vyas, a consultant in paediatric intensive care and respiratory medicine; and Dr Angie Wade a senior lecturer in medical statistics.
110. All these witnesses are clearly very experienced doctors in their own field. We shall summarise the evidence which they gave according to their respective specialities and only so far as is necessary to explain the important issues in this appeal.

The neuropathologists

111. The reports provided by Dr Waney Squier and Dr Rorke-Adams disclosed a head-on collision between these two experts on the pathological findings and on the cause of death. In our judgment they are the two of the most important witnesses in this appeal. Much of the debate has been focussed on the pathological findings and their interpretation.
112. Dr Waney Squier is a consultant and clinical lecturer at the Department of Neuropathology at the Radcliffe Infirmary, Oxford. Dr Rorke-Adams is the clinical professor of paediatrics at the University of Pennsylvania. She is clearly a very experienced and well respected member of her profession.
113. Dr Waney Squier started with the forensic disadvantage of having provided a report dated 10 February 2000 for Harris's trial solicitors in which she concluded that Patrick's injuries were non-accidental and consistent with shaking. Unsurprisingly, she was not called at trial to give evidence on Harris' behalf. She explained that, influenced by the research carried out by Dr Geddes since the trial, she had re-examined her own work in the light of the Geddes research. As a result in this case she had changed her mind and now concluded that the brain findings were of severe swelling and hypoxic/ischaemic injury; and that there was no incontrovertible evidence of trauma. She relied upon the history given by Harris and the clinical evidence as support for her conclusions.
114. Dr Rorke-Adams, having examined all the pathological evidence, the history and the clinical history concluded that the injuries to the brain, the subdural haemorrhages and retinal haemorrhages, were all clear evidence of traumatic injuries caused by strong force.
115. In the course of their evidence each of these witnesses commented on brain slices and photographs taken at the post mortem. Their evidence in respect of the findings demonstrated by the photographs and slices was in sharp conflict in a number of instances.
116. Photographs, G-H 1, 2 and 3, were said by Dr Rorke-Adams to show clear evidence of brain injury caused by trauma. She said that there could be no other cause. Dr Squier was of the opinion that the injuries shown in the photographs 1 and 3 and damage to nerve tissue at the cervicocranial junction were probably not caused by trauma and were consistent with herniation of the brain at the foramen magnum. She said herniation was caused by the pressure of the swelling brain when it impacted with the narrowing channel of the foramen magnum. As to the blood shown in photograph 2 Dr Squier said this was intrafalcine bleeding (bruising) within the membrane, seen at post mortem which was an extremely common finding in babies who have suffered from failure from blood or oxygen supply.
117. There was no dispute that photographs G-H 4 and 5 showed subdural haemorrhages in the areas of the spinal cord. However, Dr Rorke-Adams gave as the explanation for these that the vertebral arteries must have been ruptured causing massive subarachnoid bleeding and subdural haemorrhages. She accepted that the post mortem revealed no soft tissue injuries to the neck but pointed out this explanation fitted with the combination of findings.

118. Dr Squier described the subdural haemorrhages of the spine as probably caused by blood seeping down from the haemorrhage at the craniocervical junction. She said it was a common finding. Further, she did not accept that such subdural haemorrhages as were found at post mortem were caused by trauma. She said that it was local tissue necrosis causing bleeding exacerbated by a clotting disorder (DIC). In addition she said that she had seen cases where bleeding had seeped from the dura into the subdural space. As an example of this she provided her findings in the case to which we have referred in paragraphs 71 to 73.
119. In our judgment there are difficulties with the evidence of both these doctors in respect of their findings. The problem so far as Dr Squier is concerned is three-fold. First her explanation of herniation as the cause of haemorrhages in the area of the foramen magnum is, on the evidence we have heard, to say the least controversial. Dr Rorke-Adams dismissed this explanation as impossible. Mr Peter Richards said that in his 20 years experience as a surgeon he had never seen a case of herniation of the brain causing haemorrhaging at this site. He described Dr Squier's evidence on this point as astonishing. Secondly, Dr Squier can provide no explanation for the mechanism that triggered these injuries. All she can say is that the primary source of the injuries was some form of brain swelling, but she was unable to give any precise cause for the swelling. In her view the most likely explanation was sepsis or infection; and the least likely was trauma. Beyond that she frankly admitted she did not know. Thirdly, Dr Giangrande, whose evidence was not challenged, said that there was no question of DIC playing any part in any of these injuries.
120. So far as Dr Rorke-Adams is concerned, in our judgment, there are also difficulties in respect of her evidence. First, the injury to the brain which she described by reference to photographs G-H 1, 2 and 3 are not referred to in the post mortem report of Dr Bouch. Secondly, her explanation of a rupture of the vertebral artery may not be entirely consistent with there being no evidence of a soft tissue injury to the neck. But, as she pointed out, at post mortem the vertebral arteries were not dissected. Thirdly, subdural haemorrhages of the spine would appear to be very rare. Fourthly, the subdural haemorrhages described by her are neither thin-film nor situated in the classic position for SBS namely at the top of the head.
121. Before leaving the evidence of the two neuropathologists it is convenient to refer to the evidence given in this appeal by the neuroradiologists, Dr Anslow and Dr Jaspan. And we should also refer to the evidence of Mr Peter Richards. Dr Anslow and Dr Jaspan agreed that the CT scan taken at 11.50am on 5 December at the Queens Medical Centre showed a swollen brain. The sole issue between them was whether the scan showed subdural haemorrhages in the area of the posterior falx (photograph G-H 2). Dr Jaspan concluded that it was subdural; Dr Anslow that it was intradural. In the end this dispute was resolved by Dr Rorke-Adams stating that the photograph taken at post mortem, rather than the scan, showed interdural bleeding or interfalcine bleeding that is bleeding between the two dural layers in and either side of the falx.
122. Mr Richards, an obviously very experienced neurosurgeon, had no doubt that a finding that the triad of injuries was present was correct. He was equally not

in doubt that the force used to cause these injuries must have been more than rough handling. In cross-examination he agreed that he was unable to say what was the minimum force which could give rise to similar injuries.

The ophthalmic witnesses

123. The measure of agreement between the witnesses in this area of expertise was a little greater than that between Dr Squier and Dr Rorke-Adams. There was no dispute that the retinal haemorrhages were quite severe injuries and that they could have been caused by shaking. Dr Rorke-Adams had described the retinal haemorrhages as severe and towards the top end of the scale. This description was similar to descriptions given by other witnesses. There was also no dispute that on their own retinal haemorrhages findings were not diagnostic of SBS. Next, it was agreed that a sharp surge in ICP could cause retinal haemorrhages although the degree of raised ICP necessary to cause such injuries was not agreed. We have already referred to Mr Richards' experience of carrying out brain surgery procedures designed to increase venous pressure substantially, but which had not caused retinal haemorrhages (see paragraph 99).
124. On the question of the force required to produce retinal haemorrhages by shaking we have referred to the 2004 paper produced by the working party of the Royal College of Ophthalmologists. No witness was able to provide a measure of the force required. Mr Mansfield QC asked each witness what was the minimum force required. For obvious reasons no witness was able to provide an answer to this question.
125. Dr Adams expressed the opinion that the fact that the ambulance crew noted Patrick's pupils to be fixed and dilated at 2.41am on 5 December was a sign that the brain was swollen at that stage. She said fixed and dilated pupils were a clinical sign of brain swelling. Brain swelling caused stretching of the third nerve which in turn affected the pupils of the eyes. In her opinion the retinal haemorrhages were caused by raised intracranial pressure, a more probable cause than shaking. However, she said that in the absence of evidence of brain swelling the cause of retinal haemorrhages may well be shaking. On the question of the force necessary to cause retinal haemorrhages she said that the fact that the injuries were at the top end of the scale did not provide any information as to their aetiology and "You have to look at the whole picture."
126. Dr Jaspan and Mr Richards did not accept that there could have been brain swelling at 2.41am. Dr Jaspan, in his report, said that if a CT scan had been carried out at the time when retinal haemorrhages was first seen at Derby Children's Hospital little brain swelling would have been evident. In evidence, Dr Jaspan said one to two hours after an apnoeic incident one can start to see mild and subtle signs of swelling. The swelling may then progress swiftly in relatively few hours; or in other cases it could take twenty-four to forty-eight hours. Mr Richards said that ICP is normal for some hours after an apnoeic incident, possibly four to five hours before it starts to rise slowly. Mr Gregson also disagreed with Dr Adams on this point. He said that the more likely explanation was at that time, in a period of cardio-arrest, the part of the brain which controls

- the pupils had become hypoxic (Patrick was noted as pulseless). This would have caused the pupils to become fixed and dilated. This explanation was put to Dr Adams, she said her explanation was more probable and that the explanation given by Mr Gregson was one which only occurred when the infant was near death.
127. The impact of this issue is that, if Dr Adams may be correct, brain swelling may have taken place sooner than supposed by the Crown's witnesses making it possible that there was a cause for the retinal haemorrhage findings other than shaking.
128. Professor Luthert described the critical issue of the retinal haemorrhage findings in this appeal as whether it was feasible that there had been a significant and rapid increase in intracranial pressure so as to cause them. When asked whether subdural haemorrhages and retinal haemorrhages were associated with cardiac arrest, he said it was not in the context of events in hospital but the possibility of low brainstem damage might be important and might well produce a pattern of cardio-respiratory arrest which is rather different from that seen in other contexts. Although he described the retinal haemorrhages findings in Patrick's case as typical of those found in cases of alleged NAHI, Professor Luthert was one of those doctors who was concerned that the triad was a hypothesis and that the full aetiology of the injuries comprising the triad was not "necessarily known."
129. Mr Gregson described the retinal haemorrhages findings as very severe and was of the opinion that they could only have been caused by a severe degree of trauma. Dr Bonshek agreed with this opinion. In his report he described the injuries as highly suggestive of non-accidental injury. Both Mr Gregson and Dr Bonshek agreed that the degree of injury was not necessarily commensurate with the degree of force used to create it.

Evidence of a possible infection

130. One of the difficulties faced by Harris at trial and in this appeal is to suggest what was the cause of Patrick's collapse, if it was not shaking. Of course, as Mr Mansfield QC properly pointed out, a defendant faced with an allegation of unlawfully shaking an infant so as to cause injury or death, does not have to provide evidence of, let alone prove, an alternative cause. Nevertheless in cases such as this both prosecution and defence will seek to prove respectively either that there was no alternative cause or that there was one. Not surprisingly we have heard a good deal of evidence on the issue of whether or not Patrick's condition might have been caused by some form of infection. We have already noted Dr Squier's opinion that the primary cause of brain swelling in this case was or may have been infection. To deal with this issue we heard evidence principally, but not exclusively, from Professor Morris and Dr Sunderland called on behalf of Harris; and Dr Carole Jenny, Professor Klein and Dr Mark Peters called on behalf of the Crown.
131. We shall deal with this issue comparatively shortly for the reason that in his final submissions Mr Mansfield QC accepted that every possible infection

- suggested by Professor Morris and Dr Sunderland as a possible cause of Patrick's collapse was effectively disproved by the evidence called on behalf of the Crown.
132. Apart from the fact that there is some evidence that Patrick had, at worst, an upper respiratory chest infection, probably a cold, for a day or two before 4 December 1998 there was no evidence at all to suggest that he had any other infection, let alone one which might have been sufficiently severe as to cause his death. In the end Professor Morris was driven to suggest that there was a possibility that the ambulance crew arrived at the precise moment when Patrick was suffering an unexplained episode from which he would not have recovered. Professor Morris suggested that it was the resuscitative procedures which had kept him alive thereby giving his brain time to swell. We regard this suggestion as speculative and fanciful.
133. Dr Sunderland suggested that the history given by Harris of Patrick grunting and having difficulty breathing might have been bronchitis caused by respiratory syncytial virus (RSV). In our judgment this suggestion was effectively demolished by the evidence of Dr Mark Peters.
134. There is however one matter which cannot be disposed of so summarily. Professor Morris advanced the theory that although Patrick's death could not be categorised as a SIDS (sudden infant death syndrome), it could be akin to SUDI: that is a sudden unexplained death from a natural cause or natural disease. His report prepared for this appeal sets out statistics relating to SIDS and SUDIs. These statistics have been comprehensively criticised in a statement made by Dr Angie Wade. Further, she points out that Professor Morris is a pathologist not a statistician.
135. In our judgment, leaving aside Professor Morris' statistics, the general point being made by him is the obvious point that the science relating to infant deaths remains incomplete. As Mr Richards said when asked a question in the context of the amount of force necessary to cause injuries, he agreed that the assessment of injuries is open to a great deal of further experimentation and information. He assented to the proposition "We don't know all we should". Similarly, Professor Luthert in his evidence said:

"My reason for making that statement is simply that there are many cases where questions are raised as to how the child died and, because there is a big question mark over the circumstances, it is rather tempting to assume that ways of causing death in this fashion that we do know about are the only reasonable explanations. But in fact I think we have had examples of this I have heard already. There are areas of ignorance. It is very easy to try and fill those areas of ignorance with what we know, but I think it is very important to accept that we do not necessarily have a sufficient understanding to explain every case."

As noted by the Court in *Cannings* and *Kai-Whitewind* these observations apply generally to infant deaths.

Professor Whitwell

136. We have left Professor Whitwell's evidence until last when dealing with the evidence in this appeal. She was one of the team of doctors who co-authored Geddes III with Dr Geddes. In our judgment her view must necessarily be considered in the light of Dr Geddes' concessions in respect of Geddes III.
137. In this case having examined all the material, Professor Whitwell produced a report in which she referred to the fact that the major pathology was of hypoxic-ischaemic trauma damage which she said might be secondary to trauma or other cause of cardio-respiratory arrest. She went on to raise the question of the degree of force necessary to produce localised neck injuries. Her opinion expressed in the final paragraph of her report was that the injuries to the brain may have arisen in the background of a "shaking" incident but there was a possibility of an underlying natural cause of the collapse. She said the neuropathological findings may be open to several interpretations.
138. In evidence she gave some support to Dr Squier's opinion that bleeding and injuries to the nerve roots could have been caused by herniation. But she agreed in cross-examination that the most significant factor in her opinion was a stretching injury to the nerve roots.

The submissions

139. Mr Horwell submitted that the new evidence did not undermine the conviction. He asked the Court to accept that the triad had survived intact. He pointed to the fact that at 1.00am on 5 December 1998 Dr Barber examined Patrick and found him to be well. At 2.30am Patrick was found to be suffering cardio-respiratory arrest. Mr Horwell submitted that the only credible explanation for this sudden collapse was shaking by Harris. The triad of injuries was established and there was no credible alternative cause of these injuries. In addition, Dr Rorke-Adams' evidence of injuries to the brain should be accepted. He submitted that her evidence together with the evidence of the doctors dealing with the ocular injuries demonstrated that unlawful force had been used. He argued that Harris was asking the court to accept that the cause of death was a series of coincidences involving two unlikely syndromes. He invited the Court to find that all suggested causes of Patrick's collapse and death other than the triad had been disproved. The conviction was therefore safe.
140. Mr Mansfield QC submitted that there were disagreements between the experts as to the cause of death. He rightly pointed out that it was not for Harris to prove an alternative cause of Patrick's death. He submitted that this Court could not decide matters which a jury should decide such as the differences of opinion expressed by Dr Squier and Dr Rorke-Adams. Finally, he submitted that in a case such as this, where the clinical evidence and the history given by the mother, ran completely contrary to a finding of unlawful force, the Court was entitled to accept that this was one of those cases where the explanation for Patrick's injuries and his death was just not known; and/or that the amount of force used by her was no more than any mother might use to revive her baby and therefore not unlawful.

Conclusion in this appeal

141. In considering all the evidence in this appeal we have kept well in mind that our task is to decide whether the conviction is safe. We also bear in mind Lord Bingham's test in *Pendleton* in a case of any difficulty (which in our view this is) of "asking whether the evidence, if given at the trial might reasonably have affected the decision of the trial jury to convict." This approach, in our judgment, merits careful consideration in this appeal.
142. We have already stated that so far as the evidence relating to an alternative cause of death based on a possible infection is concerned, in our judgment, this evidence does not form any basis for holding that the conviction is unsafe.
143. So far as the other issues are concerned, the evidence at trial and the evidence adduced by the Crown in this appeal, provide a strong case against Harris. Mr Horwell's submission that the triad is established and that any attempt to undermine it is based on speculation is a powerful one. Nevertheless strong as is the case against Harris we have concerns about the safety of the conviction.
144. First, in order to dismiss the appeal, we would have to accede to Mr Horwell's submission that we should reject Dr Squier's evidence in its entirety. If Dr Squier may be right, such evidence of subdural bleeding as she accepts was present was small; untypical of the usual thin-film subdural haemorrhages found in triad cases; in the sense that it was not found at the top of the head and probably not caused by trauma. Secondly, if Dr Squier is, or may be, right there is no pathological evidence of trauma. At one stage Mr Horwell in cross-examination, suggested to Dr Squier that she had lost objectivity in her evidence in this appeal. This was a bold assertion and one which we find difficult to accept. It was put at the end of her evidence when Dr Squier was describing subdural haemorrhages in another case which she said represented bleeding seeping from the dura into the subdural space (see paragraph 71 to 73 above). As we have said already we find it impossible to conclude that on this issue Dr Squier's evidence is plainly wrong and that Dr Rorke-Adams must be correct.
145. The importance of Dr Squier's evidence is that it throws doubt on the significance of such subdural haemorrhages as there are; and it throws doubt on the evidence of injuries to the brain described by Dr Rorke-Adams. We are far from saying that we accept Dr Squier's evidence in preference to that of Dr Rorke-Adams. Indeed, in view of the weight of evidence disputing her opinions we have reservations about whether Dr Squier can be right. But equally, in all the circumstances of this case, the differences between them are ones which the jury would have had to have assessed in the light of all the evidence in the case.
146. Secondly, although the evidence of the findings of retinal haemorrhages is powerful supporting evidence of shaking, on its own it is not diagnostic of shaking. If the subdural haemorrhages are undermined, the retinal haemorrhages findings will not fill the gap although we recognise that both can be considered together. There is also the issue of whether Dr Adams may be correct in her view that fixed and dilated pupils seen by the ambulance crew was a sign of brain swelling at that time.
147. Thirdly, although as we have already stated the amount of force required to cause the triad of injuries will in most cases be more than just rough handling, the evidence suggests that there will be rare cases when injuries will not

- correspond to the amount of force used. It is at least possible that in such rare cases (maybe very rare cases) very little force will cause catastrophic injuries.
148. In this connection the evidence shows that in recent years the medical profession has become more aware of the degree of force necessary to cause injuries by the growing science of biomechanics. This knowledge, and to an extent Geddes I and II, in our judgment, have had the effect of moderating to some extent the conventional view that strong force is required to cause the triad of injuries. In this case Dr Bouch rejected as an explanation for the injuries he found, shaking by Harris to revive Patrick. Today he might have taken a less firm stance. This knowledge might also have acted as a counter-balance to the evidence given at trial by Professor Green on the amount of force necessary to cause the retinal haemorrhages.
149. The above factors, which have all arisen out of post-trial material have to be assessed against the background of the clinical evidence which in our judgment is significant and important. As Dr Anslow said in his report of 3 June 2005:
- "The clinical history is perhaps the most important clinical tool available to the clinician and to reject the carer's version of events in favour of another requires the highest possible level of medical evidence. After all, the Doctor is effectively accusing the carer of lying."
- Dr Anslow is not a clinician but in our judgment his words of caution are apt in cases of this sort.
150. At the outset of this judgment we have set out the clinical history. In summary, Harris was described as a careful and caring mother. She called out Dr Barber late at night because of her concerns for Patrick. Dr Barber described her as being calm and controlled at that time. The prosecution's case at trial was that in the interval between Dr Barber leaving the house and 2.30am when Harris telephoned the emergency services she must have violently and unlawfully shaken Patrick. In our judgment this history combined with the absence of findings of bruises to any part of the head, face or body; and the absence of fractures or any other sign apart from the triad of injuries, does not fit easily with the Crown's case of an unlawful assault based on the triad of injuries, itself a hypothesis.
151. The Crown relies upon the fact that Patrick was in the sole care of Harris throughout the evening of 4/5 December. It is also correct that Harris admitted shaking Patrick in an effort to revive him; and bouncing him on her knee when she was telephoning the emergency services. But, those actions are not suggestive of unlawful force being used by her although it is possible that a jury might now find them to be sufficient to cause the injuries seen by Dr Bouch albeit not unlawful.
152. As we have said the Crown's evidence and arguments are powerful. We are conscious that the witnesses called on behalf of Harris have not identified to our satisfaction a specific alternative cause of Patrick's injuries. But, in this appeal the triad stands alone and in our judgment the clinical evidence points away from NAHI. Here the triad itself may be uncertain for the reasons already

expressed. In any event, on our view of the evidence in these appeals, the mere presence of the triad on its own cannot automatically or necessarily lead to a diagnosis of NAHI.

153. The central issue at trial was whether Harris caused the death of her son, Patrick by the use of unlawful force. We ask ourselves whether the fresh evidence, which we have heard as to the cause of death and the amount force necessary to cause the triad, might reasonably have affected the jury's decision to convict. For all the reasons referred to we have concluded that it might. Accordingly the conviction is unsafe and this appeal must be allowed. The conviction will be quashed.

Rock

The focus of the appeal

154. The history of this matter has already been set out; we turn directly to the appeal. Certain matters are common ground. First, there is no dispute that Rock did shake Heidi; there is likewise no dispute (given the full thickness bruise to the back of the head) that she suffered an impact. Secondly, there is no realistic suggestion that disease or infection could possibly have played a role in Heidi's death. The thrust of the appeal was instead that the conviction was unsafe in the light of research subsequent to the trial, calling into question the minimum degree of force necessary to cause the pathology in this case. Rock, it was submitted, was not safely convicted of any offence; at the very least, his conviction of murder was unsafe and a conviction of manslaughter should be substituted.
155. For its part, the Crown vigorously resisted the notion that there was any real alternative to unlawful killing. Here, as elsewhere, it was to be borne in mind that the minimum degree of force in question was the degree of force necessary to cause all the injuries suffered; Geddes I and II did not address the minimum degree of force necessary to tear bridging veins and cause retinal haemorrhages; the "unified hypothesis" (i.e., Geddes III) which might have done so, has of course gone. The surrounding circumstances and the injuries suffered amply supported the safety of the conviction. While conceding in terms that if there had been the "triad" and no more, "that was unlikely ever in itself to be sufficient" to support a charge of murder (as distinct from manslaughter), here it was contended that there were additional features which justified the jury's verdict bearing in mind that the intention to cause grievous bodily harm could be both rapidly formed and almost instantly regretted.

The new evidence on the appeal

156. In the view which we take of this appeal, it is unnecessary to review the new evidence at length; it suffices to summarise the position reached on the totality of the new material.
157. As to radiology, save for one area (to be mentioned shortly) there was no or no real dispute between Dr Anslow (called by Rock) and Dr Jaspan (called by

the Crown). The first CT scan, taken on the 2 June 1998 at about 10.21 pm, some 2 ? hours after Heidi's admission into hospital, showed a minimally swollen brain but the presence of subdural blood. On the 4 June, some 39 hours later, the second CT scan revealed a very different picture. This showed, apart from cerebellar tonsillar herniation and established hypoxic ischaemic brain damage, a grossly swollen brain but the same small amount of subdural bleeding notwithstanding a "huge" (Dr Jaspan's word) increase in pressure. Dr Anslow accepted that subdural bleeding at a time when there was no evidence of raised intra-cranial pressure ("ICP"), was a "very strong indicator" of trauma. On the assumption that Geddes III did not apply, he could think of no cause other than trauma to account for the subdural bleeding.

158. The only area of dispute between Dr Anslow and Dr Jaspan was whether a lesion in the corpus callosum revealed by MRI scans was caused by trauma; Dr Jaspan was firmly of the opinion that it was; Dr Anslow said that it might be an artefact. As we have already indicated such disputes between reputable experts potentially give rise to difficult issues on an appeal of this nature. In the event, notwithstanding the powerful nature of Dr Jaspan's evidence in this regard, it is unnecessary for us to resolve this dispute. We proceed on the assumption that Dr Anslow might be correct.

159. In cross-examination, Mr. Mansfield QC put to Dr Jaspan one of the "scenarios" developed by Dr Geddes (see below), involving a departure from the evidence given by Rock at trial. This set of facts assumed that Heidi had struck her head when falling and was subsequently the subject of two well-intentioned shakes by Rock. Asked whether this was a possible scenario capable of explaining the injuries sustained by Heidi, Dr Jaspan's initial (and firm) answer was "no". He based this answer on his views as to the cause of the corpus callosum lesion. If wrong about that, he accepted that the scenario "might just be feasible". Immediately thereafter, Dr Jaspan was re-examined by Mr Horwell as follows:

"Q. If you leave the corpus callosum out of the equation, when you say it just might be feasible, what do you mean?

A. Because in medicine there is never a hundred per cent certainty. So, if I was asked is there a hundred per cent certainty that it could happen, I would have to be honest and say no, there must be almost the freak situation where that could happen.

Q. What are the chances from your clinical experience?

A. By inference, 99 per cent unlikely."

In his final submissions, Mr Mansfield QC sought to suggest that these answers disclosed a major concession on Dr Jaspan's part. Having seen and heard Dr Jaspan give evidence and having reviewed the transcript of his answers, we respectfully disagree. The essence of Dr Jaspan's views remained plain and

unaltered, albeit couched in rather more moderate and less graphic language than apparently deployed at trial.

160. Turning to the neuropathologists, in her report dated 14 April 1999, prepared for the trial (but which remained understandably unused by the defence), Dr Geddes said this:

"I believe that both the intracranial and the intraocular bleeding are likely to have been the result of vigorous to-and-fro movements of the brain inside the skull, of the type that occurs in a shaking injury."

Subsequently, Dr Geddes has (as is well-known) revised her thinking. That said, in her evidence at trial, Dr Geddes accepted the presence of subdural haemorrhages but was unable to provide an explanation for them. She remained of the view that for violent shaking to have produced the subdural and retinal haemorrhages here, she would have expected some form of widespread diffuse axonal injury and damage to the muscles in the neck and spinal column. She accepted, however, in answer to questions from the Court, that, on any view, Heidi must have had some insult to the brain, not explained by Rock's account of events. She could not rule out impact plus shaking.

161. In her report of 24 May 2005, Dr Geddes posited three "scenarios" (to which reference has already been made) which might have caused the pathological findings in this case. She could not be certain which of the three actually happened. The first scenario involved a low-level fall in which Heidi, among other things, knocked the back of her head, resulting in hyperflexion of the neck which damaged her brain stem. The second, also involved a fall, followed by a resuscitative (i.e., well-intentioned) shake by Rock, causing damage to her brain stem. In both these scenarios, damage to the brain stem resulted in Heidi's breathing stopping, her brain swelling rapidly and consequential subdural and retinal bleeding. The third scenario involved an assault on Heidi. We are bound to observe that the suggested sequence of the first two scenarios is troubling, given the apparent conflict with the radiology evidence (see above). Moreover, Dr Geddes was closely cross-examined as to the factual basis for the first scenario, involving a departure from Rock's own account of events in which he was adamant that Heidi had not struck her head. Pressed on this point, Dr Geddes said that she was duty bound to point out that there was impact (given the bruise at the back of Heidi's head); she thought that Rock must have been wrong in his account but had not given the matter attention when writing her 1999 report; she was (notwithstanding the factual evidence) prepared to speculate to this degree in now giving her evidence to the Court.

162. Dr Rorke-Adams and Dr Geddes disagreed as to (i) the extent of subarachnoid bleeding in this case; and (ii) the cause of a "hole" or "tear" in the corpus callosum (in a location different from that which formed the subject of the disagreement between the radiologists, already referred to). Once again, it is not necessary to resolve this dispute and, we proceed on the assumption that Dr

Geddes might be correct. For our part, we find the agreement between Dr Rorke-Adams and Dr Geddes that there were here subdural haemorrhages considerably more significant than the areas in which they disagreed. As Dr Rorke-Adams put it:

"Subdural haemorrhage is essentially always traumatic in origin except under very unusual circumstances"

In itself, of course, that answer cannot resolve the source of the trauma nor, insofar as it was inflicted by another, the intention with which it was inflicted.

163. On the appeals, evidence was given by Dr Plunkett, who has undertaken research into "low-level" infant falls i.e., falls of less than 10'. The conclusions which Dr Plunkett drew from his study were that (i) low-level falls were capable of causing serious injury or death; but (ii) that there was no inevitability about it; as he expressed it:

" ... I do not know either an upper limit or a lower limit of impact velocity below which there is no injury and above which there is always injury."

Dr Plunkett's evidence related to the cases of Rock, Cherry and Faulder. We shall have more to say of his evidence, in particular with regard to the Cherry case.

164. For the moment, we confine ourselves to Dr Plunkett's evidence with regard to the appeal of Rock. Here, basing himself on the bruise on the back of Heidi's scalp, Dr Plunkett expressed the opinion that her death was the result of an impact injury; this was an instance of a "low-velocity impact event with a bad outcome". Plainly therefore, Dr Plunkett's evidence entailed a departure from the evidence, as given by Rock; on no view, could a fall onto her bottom (as described by Rock) have explained this fatality. In Dr Plunkett's view, Heidi's head must have struck something, a matter unexplained on Rock's account.

165. We come next to the evidence of the ophthalmic experts, Professor Luthert and Dr Adams, called by Rock and Dr Gregson, called by the Crown. It is convenient to take Dr Gregson's evidence first. He put the matter starkly; the significance of the eye injuries was crucial to this case. The retinal injuries were at the very top of the range or not far from it. There were in addition para-macular retinal folds, a type of detached retina. In his evidence-in-chief, Dr Gregson explained this matter as follows:

"Q. The retina is completely detached from the eye?

A. The retina is folded up very much like a rug would be if you pushed it together. It is not detached in the same way as boxers get retinal detachments, but the fact that it is folded means it is not in the place that it should be."

A little earlier, Dr Gregson had observed that in children of Heidi's age, he knew of no other cause for para-macular folds other than trauma; this was so, regardless of when the para-macular folds had first appeared. Moreover, the presence of para-macular folds was indicative of severe injury "a lot of trauma" was required. His reason for this view was as follows:

"... the retina wants to stay attached; it does not want to fold. It requires an effort to detach it."

166. Turning to Professor Luthert, we begin with his written material. In his report of 14 April 1999, he was of the opinion that, absent any alternative explanation, severe trauma, such as shaking combined with impact, was the most likely explanation for the pathological findings in Heidi's eyes. In his letter dated 12 January 2005, he maintained the view that such trauma (i.e., shaking, impact or both) was the most likely cause of Heidi's death and the condition of her brain and eyes. He added this:

"I do not believe that the presence of retinal haemorrhages necessarily implies a specific level of force although I think the level of force is likely to be more than would be seen in even rough normal play."

167. In his oral evidence, Professor Luthert stated that it was difficult in an individual case to extrapolate from the severity of a retinal haemorrhage to any assumed degree of applied force. By contrast, in the generality of cases, it was to be expected that there would be a (broad) correlation between the degree of trauma and the seriousness of the injury suffered. That said, there was "not necessarily a tight correspondence between level of trauma and severity of outcome".

168. Initially in his evidence, Professor Luthert said that it was difficult to "exclude with total confidence" the possibility that the fall described by Rock had caused the retinal injuries. Pressed, unsurprisingly, on this point, he ultimately accepted that a fall onto her bottom would not be expected to cause injuries of this nature. Although he said that he had seen "more severe" retinal injuries, he further accepted that these were "highly significant", a description which he later amplified as meaning "extremely significant and abnormal pathology". While he did not view the presence of para-macular folds as diagnostic of shaking, he agreed that they could not "in their entirety" have been artefactual a necessary concession, as they had been noted during Heidi's lifetime. He agreed in cross-examination that the "most likely explanation" for Heidi's retinal injuries was shaking. In re-examination, Professor Luthert said that a version of the facts, in effect based on Dr Geddes' first two scenarios, was not fanciful.

169. Returning to his written report of the 2 June 2005, Professor Luthert explained that since the original trial and following publications by Dr Geddes and Dr Plunkett, he had reconsidered the minimum degree of force required to generate the "triad". He went on to say this:

"The minimum level of force required to produce this syndrome can not be defined, but the recent Royal College of Ophthalmologists Working Party concluded 'It is highly unlikely that the forces required to produce retinal haemorrhage in a child less than 2 years of age would be generated by a reasonable person during the course of (even rough) play or an attempt to arouse a sleeping or apparently unconscious child.' In my opinion, it is now not possible to exclude the possibility that a well-intentioned but ill-advised shake might cause the pattern of pathology seen in Heidi. The same Working Party commented 'It seems clear that minor falls can, only exceptionally, give rise to subdural and retinal bleeding. In these cases, it may well be that the biomechanics of the impact induce the rotational forces necessary to produce the picture considered typical of SBS.' So it is difficult to exclude with total confidence the possibility that the fall caused the injuries seen. Finally, it is also feasible that Heidi was assaulted."

In answer to questions from the Court as to this passage, Professor Luthert asserted that he had relied on Geddes I and II but not Geddes III. Professor Luthert said that he had been a member of the Working Party and agreed with its conclusions. While he was (in effect) contemplating the infliction of some force going beyond rough play, by itself that did not determine the intention of the person inflicting the force.

170. In a nutshell, the evidence given by Dr Adams was to the following effect:
- i. The fall as described by Rock was not the cause of Heidi's retinal haemorrhages;
 - ii. The injuries to Heidi's eyes were at the very top end of the scale;
 - iii. The cause of those injuries was shaking or shaking and an impact;
 - iv. Simply by looking at the retinal haemorrhages, it could not be said "definitively" what level of force had been applied.
171. For completeness, we note that in her reports Dr Adams had raised the question of whether a lumbar puncture might have been the cause of the retinal damage. Suffice to say that no evidence emerged to support this line of inquiry and Mr. Richards gave cogent evidence, which we accept, as to its irrelevance; we say no more of this point.

Conclusions

172. At the outset, we should underline that this is not a case where the expert medical evidence and the presence of the "triad" stand alone. We accept of course that Rock was a man of good character and that in general, he had been very good with Heidi. But there was also evidence of some hostility towards her, prior to the events of the 2 June 1998. Perhaps more tellingly, there was the evidence from the neighbour, Ms Banham, that, on the night, she heard Heidi screaming for a significant period of time and Rock shouting at her to "fucking shut up"; then it all went quiet. For completeness, we do not think that the reliability of Ms Banham's evidence is called into question by the mere fact of there being some

- unused and untested material from police officers, apparently saying that they could not hear shouting between the two houses.
173. Against that background, we come to the evidence in this case of the presence of the "triad"; namely, encephalopathy, subdural haemorrhages and retinal haemorrhages. There is, moreover, the bruise found at the back of Heidi's head.
174. How were these injuries caused? Having regard to the evidence we have summarised, it is plain that Rock's explanation a fall in which Heidi did not strike her head cannot account for them. We are, moreover, unable to accept that Rock's version of events was innocently mistaken, along the lines that he had simply not seen her strike her head. As set out above, he was adamant that he had prevented her hitting her head. We naturally have regard to the burden of proof resting on the Crown throughout. That burden may however be satisfied by reliance on such inferences which it is proper to draw from Heidi's injuries, taken together with Ms. Banham's evidence and the absence of an explanation from Rock, with whom Heidi was alone at the relevant time.
175. We turn then to the inferences which it is proper to draw. We do so with great caution, mindful both of the gravity of the matter and that (as already underlined) the mere presence of the "triad" does not automatically or necessarily lead to a diagnosis of NAHI and/or a conclusion of unlawful killing. All the facts of the individual case must be taken into account.
176. Given the assumptions that we have thought it right to make with regard to the disputes between Dr Anslow and Dr Jaspan and between Dr Geddes and Dr Rorke-Adams, encephalopathy does not take the matter further save for the fact of its presence. The position is, however, very different with regard to subdural haemorrhages and retinal haemorrhages.
177. As has been seen, the presence of subdural haemorrhages was common ground between the relevant experts. It was also indisputable that the subdural haemorrhages preceded the development of brain swelling and that there was no evidence of any increase in subdural bleeding notwithstanding the rise in intracranial pressure following the swelling of the brain. Pausing there, these features would themselves have gone a very long way to undermine the credibility of Geddes III, had that hypothesis not in any event been withdrawn in the manner already described. Matters do not end there. Without Geddes III, Geddes I and II cannot suggest a mechanism to explain the subdural haemorrhages; strikingly, as we have seen, Dr Geddes in her evidence could not explain them. There is accordingly no realistic challenge here to the "traditional" mechanism of the tearing of bridging veins. If so, it necessarily follows that Heidi was subject to a degree of force sufficient to tear those veins.
178. We return to the retinal injuries. On the totality of the evidence, we are sure that these were at the top end of the scale (Dr Gregson and Dr Adams) and we are not deterred from that conclusion by anything said by Professor Luthert, if indeed he ultimately disagreed. We cannot necessarily infer from the severity of those injuries, including the presence of the para-macular folds, that any precise or specific degree of force was used; we are acutely conscious both of "thin skull" cases on the one hand and of "lucky" victims on the other. We have, however, no

realistic doubt that the force used must have been as even Professor Luthert was minded to agree in excess of anything generated by a reasonable person in the course of rough play. We further have no real doubt that the cause of those injuries was shaking or shaking plus an impact; if anything, we favour the latter given the presence of the bruise at the back of the head. In all the circumstances, we regard as fanciful the notion that Heidi's retinal injuries can be explained by a fall in which she struck her head and was then the subject of a well-intentioned resuscitative shake (Geddes, first and second scenarios).

179. We have not overlooked the evidence of Dr Plunkett but we are unable to regard it as of assistance in this case. First, there is no proper factual foundation for Dr Plunkett's evidence; his opinion rests on a version of events relying on Rock's account of an accidental fall but departing from it so as to account for Heidi striking her head when falling. Secondly, Dr Plunkett's suggestion that the bruise at the back of Heidi's head caused her death, lacks credibility. Quite apart from more general considerations as to the relevance of Dr Plunkett's study to cases such as these (see below, when dealing with Cherry), his thesis here does not begin to address the subdural haemorrhages and retinal injuries.

180. We are accordingly left with a powerful Crown case for unlawful killing, based on the surrounding circumstances (Rock's shouting on the night), and the nature and severity of Heidi's injuries (the subdural haemorrhages and retinal damage). All that there is to set against that case is the suggestion of accident, based on a manifestly flawed account from Rock, the one person who could have explained what happened, supplemented by a variety of speculative suggestions from the experts necessarily lacking a sound factual base. We remind ourselves that our task is not to retry Rock; our inquiry is as to the safety of his conviction. On all the evidence, we are amply satisfied as to the safety of his conviction for unlawful killing.

181. For completeness, we are not deterred from that conclusion by the following matters:

- i. On behalf of Rock, some play was made with the moderation in language employed by Crown experts between the trial and the appeal; in this regard, as we have seen, considerable emphasis was placed on the alleged "concession" made by Dr Jaspan, an emphasis we have already indicated we regard as misplaced. We think that the submission as to moderation of language is correct as far as it goes; but we do not think it goes very far. Doubtless, as expert thinking has evolved, so, rightly, the language has moderated and become less graphic or emotive. Those are welcome developments. But when the totality of the evidence is considered, there is nothing in any of this to suggest that the safety of Rock's conviction is undermined.
- ii. Dr Geddes, as we have seen, was puzzled as to the absence of other injuries, if indeed Heidi had been the subject of violent shaking. We have given this matter anxious consideration but ultimately regard it as decisively outweighed by the overwhelming evidence pointing to a degree of force (or violence) at least going beyond even rough play. There is, as

has frequently been urged on us, no precise correlation between force inflicted and the gravity of the injuries suffered.

iii. As seen in the passages set out earlier, the Judge summed up in robust terms. On the evidence before him, no proper criticism could be made of those passages. Given the totality of the evidence now before the Court, even though an alteration in expression might have been warranted, we do not think that any change to the substance of the summing-up would have been such so as to undermine the safety of a conviction for unlawful killing on this ground.

182. What remains is whether Rock's conviction for murder as distinct from manslaughter is safe. In *R v Stacey* [2001] EWCA Crim 2031, a "shaking" case, the Court said this:

" 48. Other grounds of appeal having been examined, and in the end abandoned, that leaves only the question of whether the jury was entitled to find that she intended to do really serious harm. We are troubled about that. One brief period of violent shaking by a frustrated mother and child-minder was all that was required to explain this death. Apart from the bruises to the neck, no other injuries were found. As the judge said, an intent to do serious bodily harm may be quickly formed and soon regretted; but so may a less serious intent, simply to stop a child crying by handling him in a way any responsible adult would realise would cause serious damage or certainly might do so. That would only provide the mental element necessary for manslaughter.

49. Even allowing for the jury's obvious advantage in seeing the appellant give evidence, we have been unable to discern anything which, in our judgment, would have made it safe for the jury to convict this appellant of the more serious charge. In our judgment, the less serious charge was the only safe verdict. If the jury had had the additional benefit of hearing the fresh medical evidence we have heard, they might well have come to the same conclusion."

183. *Stacey* was of course a case on its own facts but the reasoning of the Court has, with respect, an undoubted resonance. As already foreshadowed, the Crown's stance, very fairly, was to accept that a verdict of murder was unlikely ever to be justified on the basis of the "triad" standing alone; it follows that the verdict of murder could be justified here, only, if at all, on the basis of (i) the bruise at the back of the head and (ii) Ms. Banham's evidence.

184. Elaboration is unnecessary. Those two additional features go in this case to underpin the safety of the conviction as to unlawful killing; but they do not assist on the question of murder or manslaughter. Necessarily therefore the conviction of murder cannot be sustained. We are fortified in reaching this conclusion by a consideration of the additional medical evidence we have heard. A brief period of violence (going beyond even rough play) was all that was required to cause Heidi's fatal injuries; such violence undoubtedly furnishes the mental element necessary for a conviction of manslaughter; but it does not

necessarily demonstrate an intention to cause grievous bodily harm, the relevant intention if the conviction of murder was to be upheld.

185. Accordingly, we set aside Rock's conviction for murder and substitute a conviction for manslaughter. To this extent only, this appeal is allowed. We shall hear submissions on sentence for the offence of manslaughter.

Cherry

186. We again do not repeat the facts of this matter, which have already been set out. It will be recollected that on Cherry's account, he left the child alone for a matter of minutes downstairs while he went upstairs; when he returned minutes later, she was, as the Judge put it in the summing-up, in a "poor state" on the floor. Essentially the decision for the jury was whether they could be sure that Sarah's death was caused by an unlawful act on the part of Cherry (a formulation to which we shall return, later) or whether her death was or might have been attributable to an accidental fall from a chair some 6-8 inches high ("the chair").

187. On this appeal, Mr Mansfield QC's submissions proceeded as follows:

- i. The Crown's position had shifted between trial and appeal; at trial, this was a case of impact; now it was a case of both shaking and impact; but that was not how the matter had been placed before the jury.
- ii. There was new evidence to the effect that death or serious injury from low level falls could not be ruled out. In addition, there was a possibility that Sarah had aspirated vomit. Death could have resulted from a combination of the two. In any event, if this was a case of both shaking and impact, the innocent combination of an accidental fall followed by a resuscitative shake could not be ruled out.
- iii. Great care had to be taken in approaching the bruising on Sarah's head and body, both in the light of the new evidence and the course which the trial had taken.
- iv. In all the circumstances, the conviction was unsafe.

188. The Crown resists the appeal and contends that nothing has emerged to undermine the safety of the conviction. In a nutshell, the evidence as to low-level falls is inapplicable to a fall of the nature postulated here. Upon analysis, there was no evidence capable of suggesting that aspiration of vomit was a relevant consideration. As to the new evidence, it had all to be taken into account; Cherry could not pick and choose; the introduction of a shaking component did nothing to undermine the safety of the conviction. Evidence of Sarah's other injuries, properly and fairly considered, lent support to the Crown's case and suggested that the notion of an accidental fall was fanciful.

The new evidence on the appeal

189. We begin with the pathologists. As already observed, Professor Whitwell conducted the post-mortem and was a prosecution witness at the trial; on the appeal, she now gave evidence for Cherry.

190. In her witness statement for the trial, Professor Whitwell attributed Sarah's injuries and brain damage, taken in conjunction with the scalp bruising (already described), to "direct blunt trauma". She went on to say this:

"The degree of trauma necessary to produce such damage is considerable and the findings are not consistent with a simple fall onto a carpeted surface. They are consistent with the head being forcibly propelled against a hard surface or a blunt object contacting the head.

Apart from the brain injuries there are a number of bruises on the body. The sighting of a number of these is highly suggestive of non-accidental injury rather than being caused accidentally in particular the bruises to the buttock, face, thigh and arm. "

191. Her report of 2 June 2005, prepared for the appeal, evidences her revised views. She said that the possibility of Sarah suffering a fatal injury as a result of falling from the chair had to be considered afresh in the light of Dr Plunkett's research. The "primary brain pathology" was due to lack of oxygen; this hypoxic-ischaemic injury could have been caused as a result of primary injury to the brain, causing Sarah to stop breathing and/or as a result of "vomiting with inhalation of vomit into the lungs". She would "still to some extent be unhappy as regards the scalp bruises arising in a fall but it has to be a considered possibility that Sarah's head impacted against some other surface as well as the ground".

192. In her oral evidence at the appeal, she explained that her change of view was based on Dr Plunkett's work and her own experience. She had not found diffuse axonal injury; such trauma as she found was associated with impact. The need to explain Sarah's scalp bruising (in two separate locations) led to Professor Whitwell contemplating that Sarah might have struck her head both on the window and then on the ground in the course of her fall; indeed, she later underlined that two impacts were needed to explain this bruising.

193. Professor Whitwell agreed that at post-mortem, there was no evidence of vomit or aspiration. She agreed that Sarah had up to a maximum of 22 bruises; she was "concerned" about that number of bruises. They were probably "more than" fair wear and tear for a 21 month old. In the absence of proper explanation, they were highly suggestive of abuse. There had been no developments in science between the trial and the appeal to alter her view as to the relevance of the two sites of scalp bruising. Her view at the trial (and she was the person who had conducted the post-mortem) was that those two areas of bruising had been caused at about the same time. She had herself identified traumatic injury to the brain. She accepted that the subdural bleeding occurred because of the tearing of bridging veins.

194. Dr Rorke-Adams was firmly of the view that Sarah's injuries were inconsistent with a fall from the chair; she placed emphasis on the multiple areas of injury and the extent of those injuries. Sarah's injuries were caused by "trauma"; the "pattern of injury" was characteristic of both shaking and impact; it was a combination of both. Although the degree of injury could not be correlated

with the degree of force, considering the injuries as a whole, they must have been caused by "strong force".

195. Pausing here, it will be apparent that there was agreement between Professor Whitwell and Dr Rorke-Adams: (i) that there had been traumatic injury to the brain; (ii) that there were subdural haemorrhages; (iii) that those haemorrhages had been caused by the tearing of bridging veins. There was some dispute between these two witnesses as to whether further injury to the brain, which it is unnecessary to detail, was also attributable to trauma or was artefactual in origin. Impressed as we were by Dr Rorke-Adams' evidence in this regard (the coincidence relied upon by Professor Whitwell seemed unlikely), this is another of those areas where we do not think it would be right simply to discount a reputable expert's contrary views. We therefore proceed with this appeal on the assumption (in favour of Cherry) that the brain damage suffered by Sarah did not extend beyond the areas of agreement between Professor Whitwell and Dr Rorke-Adams, summarised above.

196. We move next to the evidence of Dr Plunkett, which it is helpful to consider here in a little greater detail than in the preceding appeal of Rock. Dr Plunkett said that there was nothing inevitable about a serious injury resulting from a fall from the chair but "the potential for serious injury or even death exists". The floor surface did not matter; it was immaterial whether it was carpet over concrete or just concrete.

197. Questioned as to his research, Dr Plunkett explained that he had worked from a database for head and neck injuries involving playground equipment, recorded by the United States Consumer Product Safety Commission ("CPSC"). Over 11 years, he had identified 18 fatalities from head and neck injuries involving falls. None of the children (or infants) in his study had formal retinal examinations. These cases included falls from swings, which, he agreed were complex or complicated falls. He further agreed that none of these cases were similar to a shaken baby case. The distance of a fall is said to be measured with reference to the closest part of the body to the ground at the beginning of a fall.

198. Case no. 5 in Dr Plunkett's study was said to be closest to a fall from a 6-8 inch chair; this was suggested on the basis that the child in question had suffered the equivalent of a 12 inch fall. Dr Plunkett's paper described this fall as follows:

" A 23 month-old was playing on a plastic gym set in the garage at her home ... She had climbed the attached ladder to the top rail above the platform and was straddling the rail, with her feet 0.70 metres (28 inches) above the floor. She lost her balance and fell headfirst onto a 1-cm (3/8 inch) thick piece of plush carpet remnant covering the concrete floor. She struck the carpet first with her outstretched hands, then with the right front side of her forehead, followed by her right shoulder. Her grandmother had been watching And videotaped the fall. She cried after the fall but was alert and talking ... However, approximately 5 minutes later she vomited and became stuporous A CT scan indicated a large right-sided subdural haematoma The haematoma was immediately evacuated. She remained comatose postoperatively, developed cerebral oedema with herniation, and was removed from life support 36 hours after the fall"

Dr Plunkett suggested that, as her head had been some 42 inches above the ground when the fall began and as her body length was some 30 inches, it was equivalent to her falling from a chair 12 inches high. We confess some difficulty with this reasoning but we nonetheless continue with our consideration of Dr Plunkett's evidence. We do acknowledge that we felt, as indeed Dr Anslow later expressed it, "shocked" that a fall, as captured on the video (which was shown to the Court), could have resulted in a fatality; this, indeed, may be the strength of Dr Plunkett's evidence, so far as it goes. Nonetheless, it is pertinent to record the following: (i) It transpired, as explained by Dr Plunkett in his oral evidence following the playing of the video, that the rail from which the child fell was in fact 39 inches above the floor, not 28 inches; (ii) she fell a sufficient distance for her to rotate and so as to fall onto her head with some 2/3 of her body weight contributing to the impact; (iii) there was a lucid interval after the fall (unlike the cases before us); (iv) the haematoma was large and lop-sided (again unlike the thin film haematomas encountered in cases such as the present); Dr Plunkett agreed that the mass effect of this haematoma caused the child's death. Notwithstanding all these factors, Dr Plunkett continued to maintain that the Case 5 fall was "exactly comparable" to a 12 inch fall. The velocity was relevant and what was not known was the "minimal impact velocity" required to cause these types of injuries.

199. Closely cross-examined, Dr Plunkett agreed this:

"Q. ... your paper does not establish the proposition that any impact, no matter how minor, can lead to fatal consequences, does it?

A. That is correct."

After some questioning from the Court, Dr Plunkett acknowledged the common sense proposition that the lesser the distance of the fall, the less likely it was to cause an injury to a vulnerable part of the body. In any event though for a time it seemed that Dr Plunkett was resistant to the suggestion, the distance of a fall is a necessarily relevant consideration. Dr Plunkett's own formula for impact velocity was as follows: $Velocity (V) squared = 2 \times Acceleration (A) \times Distance (D)$. From this it must follow that, all other things being equal, a reduction in D will result in a reduced V.

200. Reverting to the individual case of Cherry, Dr Plunkett asserted that the bruising on Sarah's body amounted to "normal wear and tear". We observe at once that this answer was manifestly unconvincing.

201. Standing back from Dr Plunkett's evidence, we do not say that his work does not have utility. As recorded, we were ourselves very surprised by the outcome in case no. 5, as shown on the video. However, we think that it is important to look closely at both the limits of his study and its relevance to any individual case; the true comparability of the falls he studied to the cases before

the Court merits careful scrutiny. We return to this theme when indicating our conclusions on the Cherry appeal.

202. Mr Richards gave evidence for the Crown in this case as well. In his opinion, Sarah died as a result of a severe inflicted non-accidental head injury. His oral evidence included the following passage:

"Q. You have used the word 'severe'. Degree of force required in this particular case?"

A. Far in excess of anything we see in normal life with children of this age. Children are toddling around at this age. They fall over all the time. If they suffered severe head injury from little falls, the casualty departments would be inundated with them, the intensive cares would be full of them, my operating theatres would be operating or dealing with them on a daily basis. I have not seen a child of this age suffer a severe head injury in my 24-year neurosurgical career from a minor injury as described or ... as considered. This very short 6-inch fall."

Other than being prepared to accept never to say never, try as Mr Mansfield QC might, Mr Richards did not shift in substance from this answer.

203. We turn next to the issue of aspiration of vomit. Given that, for very good reason to which we shall come, it played an ever diminishing role on the appeal, we shall take it very shortly indeed.

204. Mr Wrightson, a neurosurgeon, whose evidence on behalf of Cherry we heard by way of video-link from New Zealand, said this, in his report for the appeal:

" ... there is no doubt that Sarah vomited and aspirated material into her lungs. The vomiting was described by Mr. Cherry and was confirmed by those who arrived to help. A chest X-ray later in the day of injury showed 'widespread airspace shadowing throughout both lungs'. The hypoxia which this would have caused is likely to have resulted in or at least contributed to the gross cerebral swelling that was present. "

In his oral evidence, Mr Wrightson said, early on, that this was "the key to the whole situation". There was no reason for Cherry to have invented the evidence he gave. As to aspiration, the ambulance personnel described a "bubbly" chest. At the hospital, copious bloodstained fluid came out from the lungs; the chest x-ray and the findings on post-mortem were likewise said to support these conclusions.

205. Under cross-examination, Mr Wrightson agreed that there was no sign of vomit at the scene; that the neighbours who attended (one of whom was a nurse) did not suggest that Sarah had vomited; that one of the paramedics had said that he did not see any signs of vomiting; that, at the post-mortem, no sign of aspiration pneumonia was found.

206. Dr Peters, a consultant paediatric intensivist, was called by the Crown. His impressively clear evidence may be summarised as follows:
- i. Neurogenic pulmonary oedema ("NPO") was a condition involving fluid in the lungs as a result of something catastrophic happening to the brain. It is characteristically immediate. The description given by the para-medics was "almost a text-book" description of NPO:

"A combination of the noisy chest, with obvious fluid, with pink frothy secretions coming out of the mouth and the child making respiratory effort to overcome this fluid in the chest are all typical. It could read like a text-book description."
 - ii. At no stage was there any evidence of aspirated vomit. The most relevant evidence was that of Sarah's appearance at intubation. Had aspiration been a major cause of respiratory failure then, typically, when the tube was placed into the lungs there would be a "welling up" from the chest of whatever was aspirated. No suggestion of aspirated vomit was made by the intensive care staff; to the contrary the fluid seen remained pink and frothy and became more blood-stained as time passed. This was a typical pattern of NPO. Had the fluid been erythromycin (a very common child's antibiotic which Sarah had been given), Dr Peters would have expected the paediatric staff to recognise the difference between it and blood-staining.
 - iii. To cause respiratory distress suddenly, massive aspiration was necessary. If so, however, it would have been apparent on intubation and subsequent care. Conversely, unless it was massive, it would not be a "credible cause" of this respiratory distress of this severity.
207. The ophthalmic evidence can be disposed of summarily. Dr Gregson, called by the Crown, fairly conceded that the retinal haemorrhages in this case were superficial only and were not typical of those discussed in the other appeals before the Court. They were not typical of shaking. In the circumstances, we do not think that the Crown case derives any support from the retinal haemorrhages. Conversely, however, we were not in any way persuaded that the absence of "typical" retinal haemorrhages somehow assisted Cherry's case on the appeal.
208. For our part, this being a case where impact as well as shaking is alleged we regard the absence of "typical" retinal haemorrhages as neutral. We say no more of this point. In the event, it is unnecessary to consider the otherwise interesting (sub-) issue as to when the retinal haemorrhages in truth first appeared.
209. Finally in this case we have considered detailed written reports from two experts in biomechanics: Dr Thibault and Dr Bertocci for Cherry and for the Crown respectively. Dr Thibault, whose approach to 'injury thresholds' we have described earlier, considered that the forces applied to the head in a 3 foot impact fall onto carpet represented approximately 50,000 radians per second squared, whereas the injury threshold associated with subdural haemorrhage and diffuse axonal haemorrhage were between 8,000 and 12,000 radians per second squared. A 3 foot fall therefore, in Dr Thibault's view, is well within the physical context

in which subdural bleeding and DAI may occur. Dr Thibault identified the primary point of impact to be the occipital region. The cause of subdural bleeding is accepted to be rupture of bridging veins, but such a rupture could occur, in Dr Thibault's opinion, as a result of the substantial internal rotational forces that arise when a child falls and impacts her head. He concluded that whilst deliberate inflicted injury cannot be ruled out, the injuries were entirely consistent with the mechanics of the speculated accidental fall.

210. Dr Bertocci explained that her habitual starting point when asked to determine whether a given account fits the resulting injuries is to begin with an assessment of any bruising found on the child: 'bruising represents points of force application and a roadmap to the child's exposure to force. Dr Thibault considered that the two apparently separate sites of impact could be explained by a fall inducing a well-distributed contact load across the occipital region resulting in dynamic in-bending of the skull and contusion to the outer left and right margins of the total contact area. The presence of bruising on two opposite sides of the head indicated to Dr Bertocci two very different lines of force applied from differing directions, and is not consistent with a fall from a chair. Further, Dr Bertocci observed that the size of the scalp bruises at 2.5cm and 3.5cm are much larger than bruises found in children injured through accidents. Finally, Dr Bertocci summarised published research and her own unit's experiments with an automotive "12 month old" crash test dummy. Her conclusion, which is again in total contrast to that of Dr Thibault, was that a 12 month old falling from a 9 inch vertical position impacting their head on a padded carpet surface would produce head accelerations that are well below published biomechanical injury thresholds. She concluded that Sarah's injuries are not attributable to a fall from a 9 inch chair.

Conclusions

211. As is apparent, encephalopathy and subdural haemorrhages are present in this case. With regard to the latter, there is no dispute here that they were caused by the tearing of bridging veins. Two elements of the "triad" are thus present. For reasons already set out, although there were retinal haemorrhages (the third element of the triad), these are neutral and do not advance the argument of either party on the appeal.
212. Next it is convenient to mention the issue of aspiration of vomit, essentially to dispose of it. We found Dr Peters' analysis of the evidence on this issue compelling. Mr Wrightson's views to the contrary do not survive this analysis. We accept Dr Peters' evidence and dismiss aspiration of vomit as a credible cause or contributory cause of Sarah's death.
213. We turn to the topic of low-level falls. We have already indicated our general views with regard to Dr Plunkett's evidence. Having given the matter anxious consideration, we are not persuaded that the postulated fall from the 6-8 inch chair was a credible cause or contributory cause of Sarah's death. Our reasons are these:

- i. On any realistic view, the fall here (if fall there was or might have been) was of a very different type and nature from those forming the subject of Dr Plunkett's study. The factual differences between any fall here and Dr Plunkett's Case 5 (said to be the closest comparable) are marked indeed, not least with regard to the nature of the subdural bleeding found.
 - ii. Even if the reservations in i) above are put to one side, notwithstanding the extent of Dr Plunkett's research, there is no example of a 6-8 inch fall, from a static object, causing death or serious injury to a 21 month old child. As he himself agreed in cross-examination (see above), it does not follow from Dr. Plunkett's study that any impact, no matter how minor, can lead to fatal consequences.
 - iii. Even if (contrary to the above) it was thought that Dr Plunkett's study did mean that a fall from the chair here was capable of furnishing a realistically possible innocent explanation for Sarah's death, it remains necessary to address the two separate sites of scalp bruising. Professor Whitwell conducted the post-mortem; as she agreed in her oral evidence, her impression (at least at the time of the trial) was that the two separate areas of scalp bruising had been caused at about the same time. Inevitably and as Professor Whitwell further agreed, no scientific developments since the trial could alter the relevance of these two separate sites of bruising. Accordingly, for the fall to be capable of providing an innocent explanation of these injuries, it was necessary to postulate two impacts (window and floor) in the course of the same fall. As it seems to us, this is pure speculation and stretches credibility altogether too far.
 - iv. We have set out earlier Mr Richards' observations (i) that if such falls did generate severe injuries, casualty departments and the like would be inundated; but (ii) that in more than 20 years of practice he had never encountered a severe head injury in a child of this age arising from a 6 inch fall. Some caution is necessary in approaching these observations; first, there is no claim that serious injury is the inevitable result of falls of this nature; secondly, "never" is an unfortunate word. Nonetheless, when this evidence based on practical experience is considered cumulatively with reasons i) iii) above, it furnishes powerful support for the conclusion that the notion of an accidental fall in this case, causing or contributing to Sarah's death, is simply fanciful.
 - v. We are not swayed from our view by the evidence of biomechanics summarised earlier. This is a complex, developing and (as yet) necessarily uncertain area of science, as illustrated by the stark divergence of opinion between Dr Bertocci and Dr Thibault. Be that as it may, Dr Thibault's views are altogether too difficult to reconcile with evidence of primary fact in this case, for the conviction to be regarded as unsafe by reason of the biomechanical evidence.
214. Pulling the threads together, this is a case of a sudden collapse of a 21 month old child. Cherry was alone at home with her. His factual account cannot explain her injuries and death. Upon analysis, the possible explanations advanced on his behalf on the appeal do not carry credibility. The case cannot be one of

SIDS, given, as is undisputed, her traumatically caused subdural haemorrhaging. As it seems to us, in the light of those subdural haemorrhages and the separate sites of scalp bruising, the inference can properly be made that her injuries and death were attributable to a combination of shaking and impact. On any realistic view (and in this case we are of course only concerned with a count of manslaughter), the force involved must have been such that the risk of some harm to Sarah would have been foreseeable to all sober and reasonable people. In the circumstances, unless there is anything in the argument as to the shift in the Crown's case between trial and appeal rendering the conviction unsafe (see below), we are amply satisfied of the safety of Cherry's conviction for manslaughter.

215. We are fortified in this conclusion by the evidence as to up to 22 bruises on Sarah's body. As Professor Whitwell was driven to agree, these were highly suggestive of abuse, in the absence of proper explanation of which there was and has been none. In approaching this evidence, we have thought it right to proceed with caution; as the summing-up suggests, at the trial, Cherry was treated as a good stepfather and there had been no suggestion of any improper behaviour towards Sarah or any of the other children. But on the state of the evidence at the trial, there may have been no need for the Crown to explore this wider area. Cherry, having introduced new lines of inquiry on the appeal, cannot, we think, complain at all the evidence being revisited. While even then we would have hesitated long and hard before treating this question of bruising as determinative of the appeal, in this appeal we see no unfairness in taking it into account as an additional reason pointing towards the safety of the conviction.
216. Finally, we turn to Mr Mansfield's submission that the conviction was unsafe because of the shift in the Crown's position between trial and appeal; at trial, this had been a case of impact; now it was one of both shaking and impact. Cherry did not have a fair opportunity to deal with the "new" case; nor did the jury consider it. With respect, we cannot agree.
217. First, as a matter of principle and as already foreshadowed in dealing with the evidence of bruising to Sarah's body, once an appellant has introduced new evidence on the appeal, he can hardly complain if such evidence is answered or rebutted by the Crown. Unavoidably, in such a process, the nature of the case may take on a different hue and there may be some change in the manner in which the Crown puts its case. But it cannot be, that on this ground alone, a conviction must be regarded as unsafe; fresh evidence, once admitted, may serve to confirm, not only to undermine, the safety of a conviction. Accordingly, if on all the evidence before this Court, the only reasonable conclusion is that, considered in the round, the conviction is safe, the Court should give effect to that conclusion: *R v Hanratty* (Dec'd) [2002] 2 Cr. App. R. 30, at [101] [104].
218. Secondly, however, this principle is qualified by consideration of fact and degree. In an individual case where an issue of this kind arises, it may be that the Crown's change of position between trial and appeal is such that the conviction cannot be considered safe. Whether it does or not will necessarily depend on the facts of the particular case. Here, we see nothing in the development of the Crown's case on the appeal that renders Cherry's conviction unsafe. The essential

question for the jury was whether Sarah's death was accidental or the result of some unlawful act on the part of Cherry. That was the fundamental divide; in this case, given the nature of Cherry's evidence, the mechanism was necessarily of secondary importance. It is true that the mechanism favoured by the Crown at trial was one of impact. It is further true that on appeal the Crown's case as to mechanism has evolved to one of a combination of shaking and impact. That evolution, however, cannot have caused Cherry any prejudice. Moreover, any suggestion here that a well-intentioned shake was capable of giving rise to a possible defence depended on the credibility of the explanations we have already dismissed, namely those relating to the low-level fall and/or the aspiration of vomit.

219. In all the circumstances, we are fully satisfied as to the safety of the conviction. This appeal must be dismissed.

Faulder

Appeal

220. Faulder's Notice of Appeal relies upon two post-trial developments. Firstly the publication of Geddes I and II which, it is said, provides a basis for questioning the explanations previously advanced for N's injuries, and, secondly, a judgment given by Mr Justice Eady in a libel case, *Reed and Lillie v Newcastle City Council* [2002] EWHC 1600 (QBD) in which Dr San Lazaro, a key prosecution expert witness in the Faulder case, had been severely criticised. In addition the Notice of Appeal relies upon a new explanation, the MORO reflex, which might explain N's sudden movement and subsequent fall from Faulder's outstretched arm. Finally, the Notice relies upon fresh expert evidence from Professor Whitwell, which calls into question the Crown's view at trial that this was primarily a shaking injury, her opinion being that there was evidence of a number impacts (which might fit Faulder's account) and that the primary cause of collapse was likely to be cessation of breathing and consequent brain damage, rather than primary brain damage due to direct trauma.

221. The 'Statement of Reasons' supporting the Criminal Cases Review Commission decision in Faulder's case refers to the trial evidence given by Dr San Lazaro and Dr Alexander to the effect that N's primary injury was as a result of direct impact between the brain and the skull, which would require massive and violent force comparable to a child being hit by a car travelling at 40 mph. As the Commission's statement observes, "within this paradigm, Mr Faulder's explanation is inadequate." The Commission refers to Geddes I and II and postulates that Faulder's explanation becomes more plausible if the cause of N's collapse is cessation of breathing. The Commission concludes that:

- a. had the jury been aware of the new evidence they might not have been certain that Faulder's account was untrue; and
- b. the medical evidence now available provides a possible alternative explanation for N's injuries and challenges the prosecution case that the injuries must have been caused by shaking.

The Injuries

222. In Faulder's case the injuries and symptoms relating to N that require consideration are:

Bruises

- i. Area of erythema (ill defined flushing of the skin) that was 'grazed/bruised' located directly on top of the head;
- ii. A triangular fresh bruise 2cm by 2cm above the forehead;
- iii. A 2cm linear bruise on the left side of the head above the ear;
- iv. A small deep blue bruise over the right forehead;
- v. A second small deep blue bruise over the right forehead but more centrally sited;
- vi. Marked swelling over the top of the occipital bone in the midline.

Subdural haemorrhage

- vii. Thin fresh subdural haemorrhage along the falx with a thin layer of subdural blood over the surface of the brain (seen on the first CT scan at 7.44 am on the morning after admission, it remained largely unchanged in subsequent scans);

Brain swelling and HII

- viii. In the first scan (12 hours after the 999 call) there is no significant brain swelling or injury. Subsequent scans over the following three days show developing brain swelling and hypoxic-ischaemic injury in both cerebral hemispheres.
223. It is of note that in Faulder's case there is no evidence of retinal haemorrhaging or primary brain injury.
224. In the course of Faulder's appeal we have considered evidence from the following experts on behalf of the appellant: Professor Whitwell, Dr Plunkett and Dr Sunderland. In response the Crown have particularly relied upon evidence from Dr Jaspán, Mr Richards, Professor Jenny, Dr Lawler and Dr Rorke-Adams.

Appellant's Experts

225. For the appellant Professor Whitwell, relying upon the Geddes I and II research, considered that the hypoxic-ischaemic injury to the brain could arise as a result of oxygen starvation caused by a sudden bending and stretching of the nerve tracts in the cranio-cervical region. As N survived, there was obviously no opportunity to use the β APP test for axonal damage to confirm this opinion. In N's case the damage may have been ischaemic and localised, but the mechanism was the same as in the case of hypoxia. The Professor, who is a pathologist,

- rightly conceded that in this case, which did not result in death, her expertise did not permit her to comment upon the interpretation of the radiological evidence.
226. Professor Whitwell considered that the findings were all consistent with some form of impact. The injuries to the head indicated a number of impacts, the multiplicity of which gave rise to concern, but in cross examination she also questioned whether all of the external injuries were clearly present at the time of admission, or, in relation to two, arose as a result of therapeutic intervention. She advised that the forces required to produce subdural haemorrhages in a child of this young age are unknown.
227. Dr John Plunkett's evidence was based upon his own research into young children and low level falls. He drew attention to the fact that the skull of a 7 week old infant differs fundamentally from that of an older infant or adult. A scalp impact to a 7 week old would cause the skull to bend inwards or deform, with a consequent deformation or movement within the brain itself. This movement, Dr Plunkett advised, could cause subdural haemorrhages and functional brain damage, for example breathing difficulties. Both Dr Plunkett and Professor Whitwell accepted that the subdural haemorrhages were assumed to have been caused by tearing of bridging veins. The minimal impact velocity needed to cause these injuries is not known, but as N did not have any skull fracture or brain contusion, Dr Plunkett postulated that the impact velocity was extremely low. In this manner, Dr Plunkett considered that all of N's injuries could be explained by the account of the fall given by Faulder. Dr Plunkett did not however accept that N had as many as 6 external head injuries believing that there were only three. In particular Dr Plunkett considered that marked swelling seen on the scans was a manifestation of the triangular shaped bruise seen earlier over the top of the occipital bone which, he explained, had migrated to the back of the head by reason of gravity. This explanation and the further explanation proffered by Professor Whitwell that the two forehead bruises were caused during treatment, were rejected by each of the relevant experts for the Crown. In so far as may be necessary we were not persuaded by Dr Plunkett or Professor Whitwell on these issues and, having seen the relevant photographs, scans and medical notes, have no difficulty in finding that there were indeed six separate sites of external head injury as listed above at paragraph 219.
228. Dr Sunderland's written report to the CCRC introduced the "MORO Reflex" (a recognised automatic response seen in babies under 8 weeks old) as an explanation for N arching his back or throwing his arms out. It was therefore surprising that it was only after a substantial number of questions in cross examination that Dr Sunderland responded to junior counsel for the Crown by saying "I am allowing you to develop your proposition. At some point I must help you. I do not think the MORO reflex is relevant to Faulder. But I am cutting in, you develop your proposition." We found Dr Sunderland's contribution in this regard fell short of that which is required by the court from an expert witness.
229. Dr Sunderland, having had Faulder's detailed account put to him, stated that a baby of N's age could have behaved in the manner described.
230. Dr Thibault, an expert in biomechanics who was, as we have said, not available to give oral evidence, produced an analysis of the evidence which

concluded that Faulder's account accorded with a biomechanical analysis of the injuries. Dr Thibault's opinion is however upon the basis that there were only two impacts: one being the linear bruise above the left ear (number (iii) in our list) and the other which caused both of the marks above the right eye (numbers (iv) and (v)). Dr Thibault discounted the swelling on the back of the head (number (vi)) which is only visible on the scan on the basis that if this had been traumatic one would have expected the treating clinicians to have noted it and, further, there is no note of any surface marking at the same location indicating an impact. The report does not consider the area of erythema located directly on top of the head ((i)) or the triangular fresh bruise 2cm by 2cm above the forehead ((ii)), these marks are shown in the photographs, however the photographs were not made available to Dr Thibault.

231. Dr Thibault considered that the linear bruise was consistent with contact with part of the high chair, whereas the two marks on the forehead were consistent with impact on a flat surface, for example the floor. The fall as described by Faulder would, according to Dr Thibault, have been sufficient in magnitude to deform the skull and cause shifting and deformation of the underlying bridging veins and neural tissue thereby producing acute SDH. He also postulated the temporary deformation causing a temporary herniation at the cranio-cervical junction leading to consequent interference with the respiratory system and thereby hypoxic-ischaemic injury.

Crown's Experts

232. For the prosecution Dr Jaspan described the existence of the subdural haemorrhages and the development of what became extensive hypoxic-ischaemic injury in both cerebral hemispheres. He considered that the most substantial impact was that which caused swelling to the right parietal region, with the other bruises resulting from injuries of lesser magnitude. Dr Jaspan, in a balanced report, drew attention to the fact that only four of the eight elements that would normally constitute a diagnostic 'full house' for inflicted injury were present in this case, namely: unexplained encephalopathy, scalp bruising, subdural haemorrhages and secondary hypoxic-ischaemic injury. He therefore considered that accidental trauma could not be entirely excluded, but some form of inflicted injury was the most likely cause.
233. Mr Richards, who in his written evidence questioned whether a 7 week old baby would have come to fall in the manner described by Faulder, in oral evidence came to accept that N may have fallen from Faulder's arm in an ordinary 'gravity roll', which did not depend upon any overt momentum from the child himself other than throwing his arms up because he felt unstable. If such a fall took place, Mr Richards would have anticipated a hairline skull fracture or a fractured clavicle. On the other hand, such a fall was unlikely to cause such severe brain substance injury and subdural haemorrhages. He concluded that it was highly likely that N suffered inflicted NAHI.
234. Professor Jenny clearly identified the six external head injuries found on N. Her evidence on this point, which we accept, was confirmed by Dr Lawlor.

- Professor Jenny's opinion was that N had sustained multiple blunt injuries to the head which were not accounted for by the history of a fall given by his father. Professor Jenny disagreed with the prosecution experts at trial, who had concentrated upon shaking rather than some form of impact causing the injuries.
235. When considering the triad as a diagnostic tool Professor Jenny regarded the presence of characteristic retinal haemorrhaging as being particularly important in identifying shaking as the mechanism of trauma. She explained that "you really have difficulty diagnosing Shaken Baby Syndrome, as opposed to abusive head trauma, if you do not have those retinal haemorrhages, because they seem to be very characteristic of that particular biomechanical event".
236. Dr Rorke-Adams' conclusion was to the same effect, namely that N was subjected to blunt force trauma to the head. She too expressly disagreed with the crown's experts at trial. Dr Rorke-Adams considered that there was discordance between Faulder's account and the severity of the injuries to N.
237. Dr Rorke-Adams, relying firstly upon her interpretation of the CT scans and secondly upon the fact that N experienced a left-sided paralysis after the incident, considered that the primary injury was to the right side of the brain, and therefore was focussed on a particular location rather than being diffuse and evenly distributed throughout the brain. Dr Rorke-Adams was the only witness to put forward this interpretation of the evidence. As a pathologist Dr Rorke-Adams was at a similar disadvantage to Professor Whitwell in this case. Equally, Dr Rorke-Adams is not a radiologist. Dr Jaspan in a very thorough report on the series of scans does not identify any particular difference in presentation between the two sides of the brain. We are therefore cautious about placing undue weight about Dr Rorke-Adams's conclusion that there was a focal (as opposed to a diffuse) brain injury.
238. Dr Rorke-Adams conclusion in favour of a focal injury to one part of the brain is the main reason for her dismissing Professor Whitwell's proposition that the brain injury may be secondary to a stretching injury at the cranio-cervical junction. Given our caution about Dr Rorke-Adams' view on this point, it follows that we do not feel able to dismiss Professor Whitwell's opinion on that basis as being untenable.
239. The prosecution expert on biomechanics, Dr Bertocci, due to the short notice available to her, did not make observations about this case.

Changes in the Crown's Case

240. The appellant asserts that the Crown's case against him at trial has now been changed in three significant respects relating to (1) his account of the fall, (2) whether there was a primary injury to the brain itself and (3) whether the injury was caused by shaking or impact.
- (1) The appellant's account of the fall
241. The appellant has consistently given an account of N's fall from his outstretched arm to the effect that N's head was cupped in his hand and N's body

ran along his forearm. At some stage N arched his back, slipped off the arm and fell, catching his back on a push-chair and his head on the bar of a high-chair before hitting the floor headfirst. At trial, Dr San Lazaro did not accept that a 7 week old child could make sufficient jerking, arching or rolling movement to propel itself from a carer's arm. That was also the position of a number of the Crown's experts on paper at the start of this appeal. During oral evidence, as we have already noted, Mr Richards came to accept that N may have fallen in the manner described by Faulder simply as a result of a gravity roll from his insecure position lying along Faulder's arm. It follows that the prosecution expert testimony is no longer entirely at odds with Faulder's account on this point.

(2) Causation of brain injury

242. At trial, Dr Alexander considered that the fall described by Faulder bore no relationship to the severity of the brain injury. His opinion was that the subdural haemorrhages and brain injury were the result of shaking and were the sort of injuries seen "in older children who have been hit by a car at 40 mph, spun round and eventually hit the floor". He described the mechanism for the brain injury by imagining that the brain was similar in substance to porridge, with the shaking causing the brain to accelerate and decelerate many times causing a spinning effect which was "just like putting a food mixer inside the brain." He further postulated that the trauma to the brain may have interfered with breathing, thereby causing further brain damage. Dr San Lazaro, at trial, explained that only "very severe forces" or "severe massive deceleration forces" would account for the brain injuries which were caused by "violent shaking and slamming down". In the CCRC report for this appeal, Dr Lazaro and Dr Alexander are quoted as stating in letters written to the CCRC in 2001 that N's injuries included "brain contusions".
243. At trial, Dr Gholkal, a consultant radiologist, did not positively identify any primary brain injury.
244. Before us, with the exception of Dr Rorke-Adams, whose opinion relating to a localised focal brain injury we have already described, none of the Crown's experts suggested that there was evidence of direct trauma to the brain. Dr Jaspán identifies secondary hypoxic-ischaemic injury and asserts that there is no evidence of primary brain injury or brain contusions.
245. N survived these events and thus the only direct evidence of the condition of his brain is radiological. Given the careful and clear evidence of the prosecution radiologist, Dr Jaspán, on this point we consider that the opinion of both Dr San Lazaro and Dr Alexander that there was primary brain injury is not tenable.

Shaking or Impact

246. At trial both Dr Alexander and Dr San Lazaro advised that these injuries were caused by very severe shaking. We have already observed that a number of the Crown's experts on appeal have expressly disagreed with this conclusion.

They regard this as a case of N being the victim of a number of blunt impact blows to the head.

247. This significant change in the case being put against Faulder is of consequence in at least two respects. Firstly, he has never been required to consider, and neither was the jury required to consider, the allegation that he hit N at least 5 or 6 times around the head. Secondly, the degree and type of force now relied upon must differ from the "hit by a car at 40 mph" description put forward at trial.
248. Whilst we note that the judge in describing the central issue in the case to the jury focused upon the defendant's intention ("did the defendant deliberately injure the child?") rather than upon any particular mechanism for injury. The expert evidence presented to the jury was that the severity of primary brain injury could not be explained by Faulder's account. Before us the position is different in that the injury to the brain substance is broadly accepted to be secondary hypoxic-ischaemic injury. The primary injuries being the external bruising and swelling, the subdural haemorrhages and unexplained encephalopathy (brain failure). Whilst Faulder's account is not accepted by the Crown, it is nevertheless an account of a series of impacts and is therefore significantly closer to the case now put by the Crown than was the position at the trial.
249. An essential question raised in Faulder's appeal is therefore what effect, if any, this change of mechanism and force has upon the central issue of the defendant's intention.
250. In summary the prosecution's position at the conclusion of the appeal differed from the Crown case at trial in the following material respects:
- a. Faulder's account of N falling from his outstretched arm is now accepted as a possible event;
 - b. The brain injury is now seen to be a secondary hypoxic-ischaemia rather than as a result of primary intra-cranial trauma;
 - c. The mechanism for injury is now stated to be a number of blunt force impacts to the head, rather than the massive violent shaking mechanism put forward at trial.

Dr San Lazaro

251. The Amended Grounds of Appeal rely in part upon the fact that Dr San Lazaro's credibility and impartiality have subsequently been seriously challenged in the case of *Lilley and Reed v Newcastle City Council* (above). It is indeed the case that Mr Justice Eady considered Dr San Lazaro's role in a substantial child sexual abuse investigation and, having heard her give evidence, found that, in order to meet what she perceived to be the needs of the children she examined, she was prepared to throw "objectivity and scientific rigour to the winds in a highly emotional misrepresentation of the facts". She was, according to Eady J's findings, "unbalanced, obsessive and lacking in judgment".
252. In the event this point was not raised in the appellant's Skeleton Argument filed at the start of the appeal hearing and did not feature in the written closing submissions. Mr Mansfield QC told us that he was effectively not relying upon

this ground in support of Faulder's appeal. We consider that this was a realistic concession. There is no challenge to the primary evidence of fact given by Dr San Lazaro. If Dr San Lazaro had remained the leading Crown expert in the case, there might well have been some concern arising from Eady J's findings, however the wealth of medical evidence that has now been acquired indicates that even were her evidence to be totally ignored there is a substantial body of expert opinion that supports the Crown's case as it is now cast.

Overview of Faulder's case

253. We now seek to draw together the various central issues in Faulder's appeal. Before doing so, it is helpful to highlight the fact that there are now no less than five different explanations for N's injuries that have been put forward by experts either at trial or on appeal, they are:
- a. Shaking and slamming down involving very severe force (Dr San Lazaro and Dr Alexander at trial);
 - b. Non-specific inflicted head injury (Dr Jaspan and Mr Richards) involving secondary, but not primary, brain injury (Dr Jaspan);
 - c. Multiple (at least six) blows to the head (Professor Jenny and Dr Rorke-Adams) causing primary localised brain injury (Dr Rorke-Adams);
 - d. A bending and stretching injury to the respiratory nerves in the cranio-cervical junction causing a secondary brain damage. On the basis that the minimum degree of force required to cause subdural haemorrhages is unknown, all the symptoms could have been caused in the fall described by Faulder (Professor Whitwell);
 - e. A blow to the skull during the fall from Faulder's arm, causing the baby's skull temporarily to deform and directly injure the underlying brain substance, which may then hinder respiration and cause secondary brain damage (Dr Plunkett).
254. On the evidence that is now before the court, there is unanimity that what occurred was primarily an impact injury. The central questions remaining are:
- i. What is the minimum degree of force required to cause these injuries? and
 - ii. Might the injuries have been incurred by a fall as described by Faulder?
255. For the reasons that we have already given, we conclude that there were six separate sites of injury found on N's head when he was examined at hospital. This is an important finding as whilst three or possibly four impacts could conceivably fit with Mr Faulder's account, it is not possible to stretch the sequence of events he describes to explain all six injuries.
256. Coming to a conclusion about the external head injuries is, however, a very much more straightforward task compared to consideration of the internal injuries. Having heard all of the evidence we are not in a position to reject Professor Whitwell's opinion that the key event was a nerve injury at the cranio-cervical junction. That opinion is based on the Geddes I and II research, which has been largely accepted by the scientific community. If that opinion is correct, then the severity of the brain injury does not arise from the degree of force used,

but from the extent to which the brain is starved of oxygen and/or blood. Questions of degree of force, on the Whitwell basis, are confined to the minimum force needed (a) to cause the cranio cervical junction nerve damage and (b) the subdural haemorrhage.

257. We have already expressed our overall conclusions upon the necessary degree of force in triad cases by stating four general propositions (paragraphs 72-80). Applying those propositions to Faulder's case we are therefore mindful that there will be rare cases where comparatively minor falls may generate serious injuries and that an infant may be particularly vulnerable to injury at the site of the craniocervical junction as postulated by Professor Whitwell in this case.
258. In not rejecting Professor Whitwell's opinion, we have particularly borne in mind Dr Jaspan's cautious analysis ("an unequivocal stance cannot be taken"). Dr Jaspan considered that only four of a possible eight signs for NAHI were present. We would add that of those four, only two are direct evidence of a primary event involving force (scalp bruising and subdural haemorrhage) whereas the other two are, or could be, secondary consequences of the primary event (unexplained encephalopathy and secondary hypoxic-ischaemic injury).
259. There are no retinal haemorrhages in this case. On Professor Jenny's evidence, that would be a cause for concern were the Crown's case to have remained one of pure shaking, but is a lesser matter of note in the context of an impact injury.
260. We have already considered Dr Plunkett's evidence in relation to the appeals of Rock and Cherry (in particular we summarise our view at paragraph 201). It is, as we have said, important to look closely at the relevance of Dr Plunkett's research to each individual case. In relation to Faulder's appeal we are troubled by Dr Plunkett declining to accept that N had more than three sites of injury. Our approach has been to evaluate each case by considering all of the symptoms as a whole, as well as individually. Dr Plunkett's inability to include and account for the six sites of injury must devalue, but not eliminate, the importance of his evidence in this particular case.
261. The jury were directed to treat Faulder as a man of good character and that is a factor that we too bear in mind. We also have particular regard to the fact that, unlike the Crown case, his account of the key event has been consistent throughout.
262. If the number of external marks of impact had been four or less we would have little hesitation in holding that there is sufficient within the evidence of Professor Whitwell, when set against the conflicting and contradictory evidence that has, when looked at as a whole, been presented by the Crown, to render this conviction unsafe.
263. We have approached each of these cases by attempting to look at the evidence as a whole. Do the two or three external marks that fall outside Mr Faulder's account tip the balance in favour of dismissing the appeal?
264. In considering this question we are conscious of the fact that this was not a matter that the jury were ever asked to contemplate in this case. In the same regard we consider it is relevant to question how fair it is for the Crown to change

- its case so radically from "very severe shaking" to "at least six blows to the head" in an attempt to uphold the conviction.
265. In conclusion we are struck in this appeal by the very radical change in the Crown case; the jury considered one case, shaking, yet that case is now rejected and we have been asked to consider a totally different allegation of multiple blows to the head. During the summing up at trial the jury were told that Dr San Lazaro was "very, very experienced" and "specialises in child protection and abuse" cases. They were also reminded that Dr San Lazaro had said "I am as certain as you can be in medicine" in her opinion that this was a shaking injury. This "certain" opinion from the Crown's principal witness is now rejected by Crown experts who are equally firm in their own opinion. We have to consider the evidence in its totality, both at trial and before us. There are, as we have observed, now five different explanations put forward by experts for N's injuries.
266. In relation to Cherry's appeal we have stressed that the mere fact that there has been some change in the manner in which the Crown puts its case will not automatically lead to a conclusion that the conviction is unsafe. It will be a matter of fact and degree to be considered in each individual case. In contrast to Cherry's case, the turnaround in the Crown's case in Faulder could hardly be more substantial. This factor, coupled with the introduction of potentially credible alternative explanations presented by the defence experts, drives us to the conclusion that, despite the number of bruises found, this conviction must now be considered unsafe. We therefore allow the appeal and quash the conviction.

Final Comments

267. In earlier sections of this judgment we have made comments on the triad of injuries, the "unified hypothesis" Geddes I, II, III, and some general issues. We do not think it possible or desirable to add anything further to those observations. In our judgment, these appeals demonstrate that cases of alleged NAHI are fact-specific and will be determined on their individual facts.
268. We have been asked by Mr Horwell to give some guidance in respect of expert witnesses in cases such as these. In his final submissions Mr Horwell submitted that these appeals demonstrated that there had been a significant failure within the criminal justice system to control and manage expert evidence. He argued that there must be a change in approach and invited the court to consider giving guidance.
269. Whether or not there has been a failure by the criminal justice system to control and manage expert evidence we are reluctant to give any new guidance on expert evidence arising from the facts of these cases. It may, however, be helpful to re-iterate current guidance.
270. As to expert evidence generally, the evidential rules as to admissibility are clear (see for example R v Bonython [1984] 38 SASR 45 and R v Clarke (RL) [1995] 2 Cr. App. R. 425 (facial mapping)). We see no reason for special rules where medical experts are involved. There is no single test which can provide a threshold for admissibility in all cases. As Clarke demonstrates developments in scientific thinking and techniques should not be kept from the Court. Further, in

our judgment, developments in scientific thinking should not be kept from the Court, simply because they remain at the stage of a hypothesis. Obviously, it is of the first importance that the true status of the expert's evidence is frankly indicated to the court.

271. It may be helpful for judges, practitioners and experts to be reminded of the obligations of an expert witness summarised by Cresswell J in the *Ikerian Reefer* [1993] 2 Lloyds Rep. 68 at p 81. Cresswell J pointed out amongst other factors the following, which we summarise as follows:

(1) Expert evidence presented to the court should be and seen to be the independent product of the expert uninfluenced as to form or content by the exigencies of litigation.

(2) An expert witness should provide independent assistance to the court by way of objective unbiased opinion in relation to matters within his expertise. An expert witness in the High Court should never assume the role of advocate.

(3) An expert witness should state the facts or assumptions on which his opinion is based. He should not omit to consider material facts which detract from his concluded opinions.

(4) An expert should make it clear when a particular question or issue falls outside his expertise.

(5) If an expert's opinion is not properly researched because he considers that insufficient data is available then this must be stated with an indication that the opinion is no more than a provisional one.

(6) If after exchange of reports, an expert witness changes his view on material matters, such change of view should be communicated to the other side without delay and when appropriate to the court.

272. Wall J, as he then was, sitting in the Family Division also gave helpful guidance for experts giving evidence involving children (see *Re AB (Child Abuse: Expert Witnesses)* 1995 1 FLR 181). Wall J pointed out that there will be cases in which there is a genuine disagreement on a scientific or medical issue, or where it is necessary for a party to advance a particular hypothesis to explain a given set of facts. He added (see page 192):

"Where that occurs, the jury will have to resolve the issue which is raised. Two points must be made. In my view, the expert who advances such a hypothesis owes a very heavy duty to explain to the court that what he is advancing is a hypothesis, that it is controversial (if it is) and placed before the court all material which contradicts the hypothesis. Secondly, he must make all his material available to the other experts in the case. It is the common experience of the courts that the better the experts the more limited their areas of disagreement, and

in the forensic context of a contested case relating to children, the objective of the lawyers and the experts should always be to limit the ambit of disagreement on medical issues to the minimum."

We have substituted the word jury for judge in the above passage.

273. In our judgment the guidance given by both Cresswell J and Wall J are very relevant to criminal proceedings and should be kept well in mind by both prosecution and defence. The new Criminal Procedure Rules provide wide powers of case management to the Court. Rule 24 and Paragraph 15 of the Plea and Case Management form make provision for experts to consult together and, if possible, agree points of agreement or disagreement with a summary of reasons. In cases involving allegations of child abuse the judge should be prepared to give directions in respect of expert evidence taking into account the guidance to which we have just referred. If this guidance is borne in mind and the directions made are clear and adhered to, it ought to be possible to narrow the areas of dispute before trial and limit the volume of expert evidence which the jury will have to consider.

274. We see nothing new in the above observations.

275. Lastly, we wish to express our gratitude to all counsel, solicitors and the many expert witnesses for the prodigious amount of work and time which they have given to these appeals. Cases of this sort raise difficult and complex medical issues. The Court is very dependent upon the skill of the advocates and the ability of the witnesses to elucidate the evidence and inform the court on the issues involved. We have received enormous assistance from all concerned and pay tribute to their efforts.