IN THE COURT OF APPEAL OF NEW ZEALAND

CA590/2007[2010] NZCA 46

BETWEEN MICHAEL SCOTT WALLACE
Appellant

AND THE QUEEN
Respondent

Hearing: 29 and 30 September 2009

Court: Glazebrook, Hammond and Ellen France JJ

Counsel: G J King and C W J Stevenson for Appellant
J C Pike and N P Chisnall for Respondent

Judgment: 3 March 2010 at 10 am

JUDGMENT OF THE COURT

A The application to adduce further evidence is dismissed.

B The appeal against conviction is dismissed.

C The appeal against sentence is dismissed.

REASONS OF THE COURT

(Given by Hammond J)

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Introduction

[1] Following his trial before Cooper J and a jury in the High Court at New Plymouth the appellant, Michael Scott Wallace, was found guilty of murdering Ms Birgit Brauer.
[2] Mr Wallace was subsequently sentenced to life imprisonment, with a minimum term of imprisonment of 18 years.[1]
[3] Mr Wallace now appeals against his conviction and sentence.

[4] The conviction appeal is pursuant to s 385 of the Crimes Act 1961. It is claimed that a substantial miscarriage of justice occurred in the following three respects:

(a) The jury was misled as to the strength of DNA evidence adduced at Mr Wallace's trial.

(b) The jury was also misled as to the strength of fingerprint evidence adduced at his trial.

(c) Trial counsel (not Mr King) failed to adequately represent Mr Wallace.

The general narrative

[5] Ms Brauer, a 28 year old German national, arrived in New Zealand in February 2005 on a one year work permit with the intention of backpacking around the country. She was beaten and stabbed to death at Lucy's Gully near New Plymouth in September 2005.
[6] In June 2005, Mr Wallace had been contracted to cut firewood in Foxton. He was given the use of a 1988 Toyota Hilux Surf (the "Hilux"). In August 2005 he disappeared from his job with this vehicle.
[7] On 20 September 2005 Ms Brauer had left Wanganui intending to hitchhike to the Taranaki region. She obtained a ride to Waitotara where she was seen getting into a four wheel drive vehicle. This vehicle then drove towards Waverley, where it was captured on a security camera. This CCTV footage revealed the vehicle to be a mid-late 1980's Toyota Hilux Surf, custom fitted with bull-bars and spotlights.
[8] After Ms Brauer had been uplifted in Waitotara, there were further sightings of a vehicle consistent with the Hilux's description near Cape Egmont lighthouse, and parked near Lucy's Gully, about 100 metres from a car park there. This was shortly after 1.00pm. The next sighting of a vehicle matching the description of the Hilux occurred between 1.00 and 1.30pm. It was being driven away from Lucy's Gully towards State Highway 45 by an unaccompanied male driver.
[9] At about 5.00pm, a jogger found the body of Ms Brauer, which had been dragged some 40 metres into the bush. The starting point of the drag trail was where the vehicle matching the description of the Hilux had been sighted at 1.00pm. Ms Brauer had been struck at least eight times to the head and body with a blunt object. While the pathological evidence at trial was that the head injuries sustained by the deceased would have been sufficient to cause death, the proximate cause of Ms Brauer's death was a knife wound to the heart.
[10] Later that day, a vehicle consistent with the Hilux's description was seen at the Waingongoro River near a site referred to as "Cardiff" during the trial. Mr Wallace was linked to Cardiff by four witnesses, and DNA recovered from cigarette butts recovered there. The police later found items that belonged to Ms Brauer, including her mobile phone battery, behind a water pump-house at that site.
[11] The river at Cardiff was searched. A solid metal bar was found. It was later identified as a manufacturer-supplied item for Hilux vehicles. The pathological evidence at trial was that the blunt object wounds on the deceased were consistent with the metal bar having been used to assault Ms Brauer.
[12] At another site on Lake Rotokare, various items belonging to Ms Brauer had been

hidden, including her backpack, sleeping bag, cellphone and diary. A latent fingerprint in the diary was later identified as being that of Mr Wallace.
[13] Mr Wallace was seen in a Hilux surf motor vehicle at Lake Rotokare on the morning of 23 September. That Hilux was later found abandoned in the Ohau River near Levin on 26 September 2005.
[14] On 2 October Mr Wallace unlawfully took a Nissan motor vehicle from a Levin address. When that vehicle drove past a police cordon on 8 October, a sustained pursuit commenced. Mr Wallace ultimately crashed that vehicle and ran away from it. He eventually heeded challenges from armed police to surrender. After he was handcuffed and read his rights, Mr Wallace allegedly said, "You should have shot me".[2]
[15] Mr Wallace was taken to the Levin police station. While speaking to police in custody he implied that, as a consequence of having done something comprising a "screw up", he had attempted to take his own life. He expressed an ongoing desire to die, and admitted to taking methamphetamine. He was equivocal regarding whether he might have picked Ms Brauer up. He said that "he could believe" that he had killed Ms Brauer, but that it had "not been with a machete".

The trial evidence

(i) The Crown evidence

[16] This was a circumstantial evidence case. The Crown relied, broadly, on the following evidence.

The vehicle

[17] There was the linkage of Mr Wallace to the Hilux. This was a combination of identification, the owner's evidence, and the circumstances of the arrest when Mr Wallace fled.

Places

[18] There was the linkage of the Hilux to all the relevant sites. Mr Wallace was linked to the Cardiff site by DNA on the cigarette butts which was 10 million million times more likely to have come from Mr Wallace than from another person selected at random from the general populace. This DNA evidence was not challenged on appeal.
[19] In particular, there was the linkage of the Hilux to the place where the body was hidden, and to the places where the items were hidden behind the pump-house, and one of the murder weapons disposed of. None of Ms Brauer's belongings were found with or near her body. They had obviously remained in her killer's vehicle.

Personal items

[20] Mr Wallace was linked to Ms Brauer's personal effects. There was the cellphone battery at Cardiff, the cellphone at Rotokare and sundry items, such as earplugs and coins from international destinations that Ms Brauer had visited, deposited at those scenes. Mr

Wallace was seen by two witnesses at Rotokare. The Crown case was that it was beyond coincidence that different persons disposed of these items: that Mr Wallace had found the items disposed of at Cardiff and that another person discarded the murder weapon. A metal bar, consistent with the murder weapon, was from a Hilux vehicle and retrieved from the river at Cardiff, where Mr Wallace was seen. Ms Brauer's diary was located, with Mr Wallace's fingerprint on a page.

Forensic evidence

[21] Apart from the fingerprint evidence, and the uncontested DNA evidence on the cigarette butts, the Crown led certain further DNA evidence. It is central to this appeal, and we will deal with it in much greater detail later in this judgment.

Timings

[22] There was Crown evidence relating to timings which was consistent with the apparent movements of the Hilux.

People

[23] Mr Wallace was said to have been identified before the murder travelling with a female consistent with Ms Brauer's appearance, and leaving Lucy's Gully alone.

(ii) The defence evidence

[24] The defence put the Crown to proof. Mr Wallace did not give evidence. The defence argument was that the circumstantial evidence was not strong enough for a conviction.
[25] Easily the most important uncontested fact from the defence perspective – which was rightly strongly advanced by Ms Hughes QC – was that no forensic evidence whatsoever was found in the Hilux which was linked to or referable in any way to the deceased: there were no hairs, no fingerprints, no DNA, nothing at all relating to Ms Brauer.

The DNA evidence at trial

[26] We need now to traverse in greater detail the Crown DNA evidence which is in issue on the appeal. The cigarette butt DNA evidence was not in issue.

The evidence

[27] The Crown led evidence as to the finding of very small amounts of DNA on the metal bar which was recovered at Cardiff, and from the jeans and boots worn by Ms Brauer.
[28] As to the metal bar, the amount of DNA which was recovered was so small that it did not allow a DNA profile of a unique individual to be established. Indeed, until relatively recently, it would not have been susceptible to forensic testing. But now very

small amounts of DNA can be amplified by a process known as Low Copy Number (LCN). As the ESR in New Zealand did not at that time undertake LCN work, the samples extracted from the open end of the metal bar were sent to Dr Whitaker in the United Kingdom. He is a recognised DNA expert who has testified in criminal trials in the United Kingdom and elsewhere.

[29] This LCN analysis of the material from the open end of the bar, in the opinion of Dr Whitaker, yielded a partial profile of a female with a DNA profile shared by Ms Brauer.

[30] As to the footwear, swabs taken from Ms Brauer's boots were tested by Y-STR analysis by Bode Technology, in Virginia in the United States of America. Y-STR analysis refers to short tandem repeat markers found on the Y chromosome. This can sometimes be useful in addressing kinship analogies, although the test does this by targeting DNA profiles contributed by a male.

[31] Y-STR was chosen because the expectation is that female DNA will predominate on boots worn by a female, and STR analysis may miss any male contributed DNA. To obtain a full profile from Y-STR, 12 markers on the Y chromosome are required. The testing in this case obtained data at the sites of five markers. It was for this reason that again only a partial profile was obtained. On Bode's analysis, this meant that, when compared with the reference sample, the appellant could not be excluded as a contributor.

[32] It should be added that the particular samples in this instance were taken from the bootlaces and from the backs of Ms Brauer's boots. The evidential significance of this was that Ms Brauer – and this was not in contention – had clearly been dragged on her back down from the roadside feet first. Her killer had removed her boots, the laces of which were undone.

[33] The Y-STR results were then interpreted in light of the New Zealand male database by Dr Sallyann Harbison of the New Zealand ESR. She was called to provide a statistical interpretation of the Bode data. Her evidence was that the DNA profiles could have come from Mr Wallace and any paternal relative. The partial profile was then analysed against a database of 287 New Zealand males. She reported that this partial profile was 13 times more likely to have originated from Mr Wallace or a paternal relative than from another male randomly selected. Dr Harbison testified that she would not expect the 13 times outcome to change with an increased comparative New Zealand male data set.

The defence case with respect to this evidence at trial

[34] Ms Hughes obtained an extension of legal aid to engage the services of Dr Martin Sage, a forensic pathologist. She asked Dr Sage about the likely time of death and whether Ms Brauer was necessarily killed where her body was found. Ms Hughes' deepest concern was that, despite Ms Brauer having been in Mr Wallace's vehicle for some hours, there were no fingerprints, no DNA, no hair and no blood from her there. With the exception of the Y-STR DNA on her bootlaces and on the heel of her boots no distinct connection between Mr Wallace and her could be found. In relation to the DNA on Ms Brauer's boots and laces, Ms Hughes flagged the possibility in her cross-examination of Dr Harbison and Dr Cline, a forensic scientist at Bode, that the DNA might have come from another male, completely unrelated to Mr Wallace, with the same Y DNA characteristics. This was clearly the strongest plank in the defence case, and Ms Hughes correctly advanced it strongly at trial.

[35] Ms Hughes had also obtained legal aid to engage the services of Dr Peter Cropp, a forensic scientist, to assist the defence on the question of the DNA evidence. Dr Cropp was provided with copies of all the information and records obtained by the ESR in its analysis of the various samples taken in relation to the crime. He travelled from his home in Christchurch to New Plymouth to view the scene. Dr Cropp confirmed that the science to which the prosecution had referred had been conducted according to acknowledged standards and that he had no criticism of either the methodology or the results demonstrated.
[36] In those circumstances, the defence could not do any more than try to discredit a circumstantial case at trial. The LCN and Y-STR DNA evidence, as advanced by the Crown, was not in contention.

The Crown use of the now contested DNA evidence at trial

[37] In closing its case, the prosecution took the jury over the various strands of circumstantial evidence in its favour, together with the DNA evidence on the bar and footwear.
[38] In relation to the Y-STR evidence, the prosecutor noted in closing that this evidence was not a unique identifier. It was possible for an unrelated person to have had the same Y-STR profile, purely as a product of chance. As to the samples from Ms Brauer's boots, the Crown repeated what had been said by Dr Harbison: that the partial profile was 13 times more likely to have originated from Mr Wallace or a paternal relative than from a person randomly selected from the New Zealand population.
[39] As to the LCN evidence, the Crown referred to the relevant extracts of Dr Whitaker's evidence relating to the partial profiles as supporting an assumption that on the circumstantial evidence Ms Brauer's DNA was represented in the DNA which had been extracted from the metal bar.
[40] The overall significance of this for the Crown case, as it related to the DNA evidence, was put on the basis that the evidence as advanced in court was *consistent* with the Crown case but not *determinative* of it.

The Judge's summing up on the DNA evidence at trial

[41] Cooper J took that same line in summing up. In the particular context of the case, the Judge was circumspect as to the DNA evidence which had been led. He made it clear that the DNA evidence had to be considered in the context of all the evidence. He said it was for the jury to determine how important that evidence was in relation to the appellant's guilt or innocence. The Judge referred to: [3]

traces of what *could* be the accused's DNA on the laces of Ms Brauer's boots found at Lucy's Gully; ... and on the traces of what *could* have been her DNA within the slots of the metal bar".

The jury was also specifically told by the Judge that the DNA from the metal bar was in such a small quantity that it was impossible to express the results in terms of the high

likelihood ratio used in relation to other DNA results in the evidence. That reference was clearly to the uncontested cigarette butt DNA evidence.

The overall position at trial

[42] It is worth pausing at this point to survey the position, at trial, overall. The Crown had a strong circumstantial evidence case. Mr King tried valiantly to persuade us that it was not at all strong but we were not persuaded by that argument. Even leaving aside the now impugned forensic evidence there was still a strong circumstantial case and it is difficult to see how, even removing that evidence from the scales altogether, a murder conviction could still not properly have been returned by a jury.
[43] As to the now impugned DNA evidence, it was not mishandled at trial. The essence of the problem with scientific evidence in this sort of context was accurately put by Lawton LJ in *R v Turner*:[4]

The fact that an expert witness has impressive scientific qualifications does not by that fact alone make his opinion on matters of human nature and behaviour within the limits of normality any more helpful than that of the jurors themselves; but there is a danger that they may think it does.

[44] The (dangerous) power of the unqualified finding of an authoritative expert that there is forensic evidence which directly links an accused to the crime scene has long been recognised. The importance of this cannot be overestimated and strong warnings are often needed from trial judges to ensure that jurors are properly critical with respect to what has been advanced by experts.
[45] In this case (as matters stood at trial) there was proper circumspection on the part of the Crown and the Judge. There was no attempt to overreach with this forensic DNA evidence. Indeed, there is no appeal point as to the strength of the cautions which the Judge gave to the jury. It was patently open to the jury to return the verdict it did on the evidence as it stood at trial.

The appellant's grounds of appeal: something old, something new

[46] The appellant has run the appeal two ways: firstly, by squeezing it into traditional grounds of appeal and second, by asserting more broadly (on the basis of prospective post-trial evidence) that the fingerprint and DNA evidence is scientifically unsound, and that the jury has been misled.
[47] As to the latter, it is immensely difficult for an appellant to run an argument about scientific evidence post-trial when there was no trial challenge. At trial, such evidence would be cross-examined on and would go into the total pool of evidence for jury consideration. In this case, Mr King wishes to run an appeal based on "fresh" scientific evidence, or at least a fresh interpretation of it. The appeal proceeded on the basis of affidavit evidence only; neither party wished to cross-examine.
[48] Before we approach the particular scientific concerns in relation to the DNA evidence, we must also consider the appropriate principles to apply on a miscarriage appeal. An appropriate starting point is Lord Judge CJ's recent restatement of the bedrock

principle for the criminal justice process: "The objective of the criminal justice process is that after a fair trial there should be a true verdict".[5] In an imperfect world, something may go wrong with a trial. It follows that, with respect to a miscarriage appeal, the focus has to be on the safety of the verdict, however a miscarriage has been caused.[6] It must also follow that, in principle, a critical reliance on "bad science" *could* lead to an unsafe or wrong conviction. That seems to have been recognised, at least in principle, by the Supreme Court in granting leave to appeal in *R v Gwaze*.[7] The present point is that, on a "bad science" argument, the door can never be closed even if the "better science" is not "fresh" in the conventional sense.
[49] Within the discipline of science itself it could be said that scientific principles always "exist" in some sense. Often – indeed routinely – humans have simply not been clever enough to understand and use those principles yet. As Kirk has noted: [8]

physical evidence cannot be wrong; it cannot perjure itself; it cannot be wholly absent. Only in its interpretation can there be error. Only human failure to find, study and understand it can diminish its value.

Progress in science lies precisely in a further enlargement of human understanding. So "freshness" in terms of true scientific principles has to be understood in a distinct context for legal purposes.

[50] What is most important for legal purposes is another of the traditional yardsticks for admission of further evidence in a case like the present, namely cogency. The question is as to the prospective potential weight of that which is sought to be advanced.
[51] The influence of forensic science in relation to criminal justice has risen sharply in recent years. This is probably not just as a consequence of technical or scientific progress but has arisen in combination with external cultural, social, economic, legal and political factors. For instance, the establishment and expansion of DNA databases by the state proceeds on the assumption that such an investment will contribute to improvements in the effectiveness of criminal justice. That said, forensic science is a complex area, and there is the distinct problem that the requirement for scientific results has to be expressed in the legal domain within complex adjectival rules and evidential protocols that are rather different to the process of scientific reasoning.
[52] Despite these contextual factors, we consider that the critical factor in relation to the "fresh" forensic evidence in this case is the cogency of what is sought to be advanced. That cogency must be of an order that the verdict of the jury in this trial – correctly arrived at on the evidence before it – should be set aside and a new trial held. We proceed on this principle when we address the forensic evidence.

Counsel incompetence

[53] Mr Wallace has raised, by affidavit and through his counsel's submissions, a number of concerns about Ms Hughes' handling of the trial. Some of these relate to the forensic evidence and are better dealt with in that context in due course. We here deal with the other matters of concern.

Change of venue

[54] Mr Wallace says that he was concerned that he could not get a fair trial in the Taranaki area. He deposed:

I requested my lawyer to seek a change of venue for my trial but I do not believe that she did so. She told me that she had applied and that it had been turned down, but I do not believe this is true.

[55] Ms Hughes denies any such instruction. She deposed that this was an issue which she had given "considerable thought" to. She obtained an extension to legal aid to access film footage and print media of the circumstances leading up to Mr Wallace's arrest. After reviewing this material she came to the view that she could not sustain an argument that there was greater prejudice to Mr Wallace in being tried in New Plymouth rather than elsewhere. This was because the publicity was nation-wide.
[56] We accept Ms Hughes' evidence; it is supported by the documentation relating to the steps that she actually took. This was not a propitious case for a change of venue application.

Not giving evidence

[57] Mr Wallace deposed that before and during the trial he had intended to give evidence. He said that he believed he should have given evidence but took the advice of his lawyer and did not. It is not suggested by Mr Wallace that his choice was taken away from him by Ms Hughes. He grudgingly accepts this point in his affidavit:

On this basis I suppose I have to live with my decision to take my trial lawyer's advice not to give evidence, but I really think this was a mistake and that I was pushed into making a decision that I really did not want to make.

This simply will not do. Mr Wallace had his choice to make. He made it.

[58] It is relevant to consider whether Mr Wallace giving evidence would in any event really have assisted his cause. Experienced counsel and trial judges would surely have considered that there was so much to be explained by Mr Wallace that he was a very high risk candidate for giving evidence.

Not following instructions

[59] A variety of relatively low level concerns were raised by Mr Wallace about Ms Hughes not following instructions. We do not deal with these. All were quite satisfactorily dealt with by Ms Hughes in her affidavit, and we do not burden an already lengthy judgment by detailing them.

Failure to challenge the Crown evidence

[60] Mr Wallace has suggested in his affidavit that, in broad terms, Ms Hughes did not sufficiently challenge certain Crown witnesses. We have perused the trial record. We are satisfied that this was a firmly conducted defence.
[61] The issue which seems to concern Mr Wallace most is that he deposes that when he was arrested on 8 October a member of the Armed Offenders Squad, Officer Ross, said to him, "You are lucky you stopped". Mr Wallace says, "I asked him ... Why, were you going to shoot me?" He then complains that both at the depositions hearing and trial Officer Ross told the Court that what Mr Wallace had said was "you should have shot me".
[62] There is nothing in this point. Mr Wallace belatedly seeks to challenge the officer's long-standing account. Of course, the only way this could have been properly challenged was if Mr Wallace himself gave evidence as to what he had said, and for the jury to prefer Mr Wallace's account. So this point is tied up with the giving of evidence. True it is that Mr Wallace's preferred construction could have been suggested to the officer at trial. But as any experienced counsel would well appreciate – and Ms Hughes did – that kind of suggestion in the context of this sort of trial would do more harm than good without Mr Wallace giving evidence.

The fingerprint evidence

[63] In summing up to the jury on the evidence, Cooper J said: "The accused's fingerprint was found in the address book that was discovered amongst the items in the concealed sleeping bag at Lake Rotokare."[9]
[64] The Judge noted that this was one of the items in respect of which the prosecution "put it to you that there were simply too many coincidences for you to be left in any doubt that Mr Wallace must be the person who killed Ms Brauer".[10]
[65] It is correct that there was no defence challenge to the fingerprint by the defence at trial. It will be recalled that the defence obtained expert advice regarding the fingerprint and it was confirmed that the fingerprint was that of Mr Wallace and that there were no grounds to object. As Ms Hughes deposes in her affidavit, she did the best she could from the bar to come up with an "alternative explanation". The line that she took was succinctly expressed by the trial Judge in his summing up:[11]

Turning to the sighting at Lake Rotokare on 23 September, Ms Hughes submitted that the apparently relaxed behaviour of the man that Mr Taylor and Ms MacIntosh reported seeing was not consistent with him being a murderer seeking to hide. She invited you to consider the possibility that Mr Wallace, if he was there, may have found Ms Brauer's sleeping bag hidden down by the lake edge, gone through it, perhaps helped himself to items from it, possibly picking up the sunglasses for example and possibly putting his fingerprints on some of the items, including the address book. Then, having done that and becoming aware of the fact that a murder had occurred, his instinct would have been to try to hide, to evade arrest, feeling perhaps that he would be under suspicion, and she submitted that that would be consistent with the fact that at that point he had began to run, it was at that point that he decided to leave Taranaki and head south.

[66] Nevertheless, Mr King has argued that it would be wrong to suggest that Ms Hughes did all that was reasonably available to her. He said that challenges might have included:

(i) Cross examination on the case of Brendan Mayfield, a lawyer in the United States identified by the FBI laboratory as the source of the fingerprint found on a bag of detonators in Madrid that was connected to the Madrid bombings. A second FBI investigator concurred with the original identification, which was in turn reviewed and confirmed by the unit chief. All of these identifications were subsequently acknowledged to have been wrong, and prompted the US Department of Justice to complete a report; Review of the FBI handling of the Brendan Mayfield case, January 2006,

(ii) A challenge based on confirmation bias – the circular reasoning whereby the examiner, who has been provided with the suspect's prints, is influenced by those known prints when dealing with a similar print, and effectively works back from the known print looking to similarities, including some details that are ambiguous or questionable,

(iii) The fact there is now a precedent for mistakes being made, and analysts influenced, by the pressure of high-profile cases (as noted by the Mayfield review),

(iv) The final and most important point, probably lost on the jury, that ultimately the analyst's opinion is a subjective judgement call. It is framed by the examiner's training, experience, in the context of the case. The match is not a complete match. Whenever a latent fingerprint and a rolled fingerprint are compared, there will always be differences of detail, even if both are from the same region of friction skin. An analyst will claim there is a match when differences are considered to be within the acceptable range of differences. In this case, the analyst was dealing with a very poor partial print. Notwithstanding that, the jury were told that the print had quite a large amount of detail present, and that there was sufficient quantity and quality of the detail present to come to the conclusion that the two fingerprints were definitely the same and that the analyst had no doubt they were made by the same person, namely Wallace.

[67] These assertions are a thinly veiled claim that counsel had not 'kept up professionally with the play' on fingerprint evidence, and should have done more.
[68] The changes which have taken place in recent years with respect to fingerprint evidence were extensively discussed by this Court in *R v Carter*[12] and can be found in any of the standard contemporary works on forensic science to be found in law libraries.
[69] As we apprehend it, the present situation in the United Kingdom and New Zealand is that courts still largely accept a non-numerical standard, and challenges are not routinely made to the identification. This may be because of an ongoing perception that in general fingerprint evidence is irrefutable and safe. And it may be that, in general, there is something of a lack of adequate defence expertise. On the occasions when challenges are made, they tend to be directed toward discrediting the examiner, raising questions going to the lack of a demonstrably transparent process, or attacking scant recordkeeping. In relation to the latter, examiners are sometimes inclined to document factually what has been done without documenting why a given conclusion has been drawn.
[70] That said, it is the particular case which matters. What happened in this instance is

that the experienced New Zealand fingerprint officer marked up 14 points of identification on which she was clear, and from which she considered an identification could be drawn. Her conclusion that the print was that of Mr Wallace appears to have rested on two factors: the particular pattern (a whorl), and that there was sufficient quantity and quality of detail present to enable her to give her considered opinion.

[71] There was extensive cross-examination on her evidence, although in fairness it appears none at all in relation to the fingerprint in the diary. Most of the cross-examination was directed to the impossibility of aging prints.

[72] Given the lack of direct challenge to the fingerprint evidence, it is not at all surprising that the Judge gave no specific direction on fingerprint evidence. There is no complaint about that. But he did give the jury a normal and adequate direction about expert evidence (which he expressly mentioned was also directed to the fingerprint officer). That direction was as follows:[13]

Now these people have all given evidence about their opinions on various matters within their areas of expertise. Normally witnesses are not allowed to give evidence about their opinions, and are confined to telling the jury what they saw or heard. But there is an exception to that rule in the case of experts. That is because, by virtue of their qualifications and experience they have knowledge about things that will assist the jury to understand matters that they would otherwise find it difficult to understand. So experts are allowed to assist by expressing their opinions. But it is important for you to understand that, just as with any other evidence, your task is to consider what these witnesses say, and decide for yourselves whether you accept or reject what they have told you. This is a trial by jury, not a trial by experts. So, although you must have regard to their qualifications and experience, you do not accept their evidence uncritically simply because they are experts. And whether you accept it in whole, in part, or not at all, is a matter for you as jurors.

[73] The fresh evidence which the appellant wishes us to have reference to is that of Mr Mark Acree. He is an independent forensic scientist with a Masters degree in Forensic Science from a university in the United States of America. He has worked for the FBI, is a court qualified fingerprint examiner, and gave evidence in the famous *Mayfield* case in which a miscarriage of justice was identified.[14]

[74] Mr Acree's analysis of the latent print in issue in this case revealed only 11 possible points of identification that were of sufficient quality to stand on their own prior to comparison with any other known point. And on his analysis only seven points of identification were found to have a positive correlation between the latent print and the right index finger of Mr Wallace; four points of identification were not accounted for in the right index finger of Mr Wallace. Because he could not detect what he regarded as a sufficient number of points of identification, Mr Acree said that the correct result to return was "no conclusion".

[75] This is not a case in which another fingerprint identification expert has indicated that there is no correlation at all. Points of similarity were found by him, but they were not in his view sufficient to make a positive finding.

[76] Given the context, this fresh evidence cannot be sufficiently cogent to allow its admission post-trial, let alone be a basis for or contribute to a new trial. This Court cannot

allow post-trial shopping for another expert to challenge directly relevant expert evidence which was admitted at trial and cross-examined on. Again, we repeat the caution voiced earlier in this judgment that with respect to scientific evidence a court should never say never. It is conceivable that there may subsequently be powerful scientific evidence which renders a point advanced at trial simply incorrect. But in this instance Mr Acree's evidence is nowhere near sufficiently cogent; it is simply a different view on how many possible points of identification are required to be able to give a professional opinion.

The impugned DNA evidence

Introduction

[77] It is necessary to give a little background to explain how the forensic contest in this case has come about. Modern forensic DNA "history" began with the investigations by Sir Alec Jeffreys from Leicester University in the United Kingdom into the rape and murder of two teenage girls in an ancient village in Leicestershire. This pioneering case demonstrated the potential of DNA profiling and clearly demonstrated its future as the most important forensic investigative tool to be developed in the 20th century.[15]
[78] In the broadest terms, DNA profiling has gone through three major stages of technological development. These were the multi-locus, single-locus, and STR stages. The first method was that pioneered by Jeffreys. His insight was that tandemly repeated DNA sequences, or what are sometimes called "mini satellites", were variable between different individuals. Mini satellites were visualised by digesting the DNA with enzymes to cut it into fragments of differing lengths. Ultimately the process produced a pattern that looks a bit like a bar code. Jeffreys and his co-workers claimed that the process produced patterns which were specific to an individual and they coined the term "DNA fingerprints" for them. Subsequently, that seems to have changed to the term "DNA profiling". This mini satellite analysis took many weeks to complete, and was very expensive.
[79] The next step in the historic development, that of single-locus probes, targeted only one locus at a time. This is the exercise that is referred to as variable tandem repeats in the United States. As expected, most individuals showed one or two alleles (markers) at a given locus. In the early 1990s, statistical interpretation of these profiles was by use of a product rule. The alleles were characterised by a measurement of their molecular weight. Each allele was an integer multiple of the repeat sequence plus the flanking DNA.
[80] By about the mid 1990s, technology had changed further to encompass the use of STR loci. This technology seems to be like a molecular photocopier. It enables the exponential amplification of very small amounts of DNA. In the earlier methods typically 500 ng was required for a successful test. But with the new technology one ng or less could be analysed. In fact, it is apparently possible to amplify the DNA of a single cell by this method.
[81] There are downsides to this more modern technology and they have to be recognised. In simple terms, the suggested guidelines or protocols for reporting the LCN evidence are necessarily different to earlier style DNA profiling because of the increased uncertainty in the origin of the DNA, and the increase in artefactual issues. "Artefact" in forensic science refers to a structure or feature visible only as a result of external action

or experimental error.[16] The advantages are that the sensitivity of the analysis is increased; the time taken for analysis is considerably reduced from weeks to only a few hours; cost effectiveness goes up because of the reduction in labour required; there is the possibility of analysis of degraded DNA samples (short segments of DNA stand a higher chance of being intact after degradation); and the collection of data can be automated and the analysis of the data partially automated.[17]

[82] Because results have been obtained from as little as a single collected cell, this capability encouraged attempts to try to recover DNA profiles from, for instance, touch evidence. As Butler has said in *Fundamentals of Forensic DNA Typing*, "this low template DNA analysis can sometimes push the envelope of what constitutes reliable results unless measures are taken to demonstrate reproducibility of allele calls".[18] The same author comments that when working with low amounts of DNA template, success rates are often poor. Dedicated "clean" facilities and extreme care are required to avoid or at least limit contamination. Mixtures can result from touch DNA or other low level DNA analyses that may not yield meaningful results. Very importantly, results may not be probative if the sample could have been deposited innocently at the crime scene even before the crime occurred. Thus, low level DNA recovered from a crime scene may not even be legally relevant to the crime committed.[19]

[83] Unsurprisingly, this advance into "frontier" technology has occasioned a very lively scientific debate, and some real concern for justice agencies and the courts as to how they should appropriately respond to it.

[84] From the point of view of the legal system, a critical issue for courts is to determine whether the DNA profile which has been obtained is coincident with the activity of the crime itself, or whether the transfer of DNA could have been by an innocent method. If a court considers that the presence of the profiles could have been attributed either to contamination, or even evidence tampering, then those are issues of relevance of the evidence, and not an issue of the match probability itself.

[85] Scientifically, these probabilities could be identified by using a Bayesian inference.[20] Bayesian inference uses aspects of the scientific method: it involves collecting evidence that is meant to be consistent or inconsistent with a given hypothesis. In principle, as evidence accumulates, the degree of belief in a hypothesis ought to change. With enough evidence, it should become very high or very low. Hence, proponents of Bayesian inference argue that it can be used to discriminate between conflicting hypotheses. Those with high enough support should be accepted as true; those with very low support should be rejected as false. Some proponents of Bayesian inferences argue that the approach is in fact no more than what a sensible person would do – given that we are not possessed of an all seeing eye of God – in coming to a conclusion anyway.

[86] There has been much argument as to whether Bayesian logic is something an average juror will readily appreciate. The suggested complexity of the approach, often involving complex algebraic formulations, led to it being ruled inadmissible in the United Kingdom in *R v Doheny* on the argument that it presses upon the territory of the jury. Because the jury combines evidence by intuitive processes, the English Court of Appeal in that case concluded that there was little hope that the jury could understand the complexity of the Bayesian approach that was put to it.[21]

[87] As a matter of logic, what all this means for criminal trials is that with low level

DNA profiling it is not so much a question of the particular technique or method. This can, if rather painfully, be explained to judges and jurors. It is the philosophy of the approach that is important: the uncertainty of the method of transfer does not diminish the fact of the matching DNA profile for the former does not invalidate the latter. The method of transfer however is of great moment for the court, whilst it does not necessarily concern the scientist.

[88] Once this insight is appreciated it explains why it is so important to present low level DNA evidence in the context of the supporting non-DNA evidence. It is in recognition of that critical feature that the Crown Prosecution Service (CPS) in England and Wales does not use DNA as "sole-plank" evidence. Of course, there may be cases where there is insufficient non-DNA evidence that can be adduced as evidence at all, which is a relevant concern under the Evidence Act 2006.

What is being contended for here?

[89] As a preliminary point, we have to say that we were concerned at hearing, and we are still strongly of this view, that a fresh evidence application in the context of a specific appeal is a completely unpropitious vehicle for what is patently a cause- oriented exercise in law reform with the objective seemingly being to outlaw the admissibility of LCN DNA evidence. This Court could not responsibly be expected to undertake such an exercise on what is no more than preliminary affidavit evidence, and without cross-examination. What would have to be shown is that the evidence advanced at trial should not legitimately have been advanced at all, or was so dubious, that the proposition advanced could not safely have been before the jury. The latter kind of case will most likely arise where an expert for the prosecution has advanced a decidedly minority view, when the overwhelming weight of authority in the scientific world was to the contrary. This case is quite different: what is being advanced is a minority view (though undoubtedly sincerely held and on reasoned grounds) by a particular witness.

[90] Some further background is necessary here. What caused the pulse of defence lawyers to quicken was a highly-publicised case where LCN evidence was criticised in the Omagh bombing trial in Belfast.[22] One issue in that case was the possibility, already adverted to, that there might have been contamination in the handling of the DNA samples. Following the Judges' ruling the use of the technique was suspended in the United Kingdom, pending a review. This took the form of an independent report by the Forensic Science Regulator in the United Kingdom. This report (commonly known as the Caddy Report) concerned the analysis of Low Template DNA involving amounts too small for standard DNA profiling. Professor Caddy reported that it should not cause wrongful convictions. The review's authors did call for improvements in the collection of DNA from crime scenes, and in its analysis, to avoid the evidence becoming unusable. The report made 21 recommendations to standardise procedures, including ensuring that police evidence gathering kits are DNA clean to avoid contamination with someone else's genetic profile; a national agreement on how to interpret the results from low template DNA; and clear guidance on how courts should interpret the evidence. The report's authors also voiced concern about the quality of some of the forensic science conducted by police laboratories, which too often analyse Low Template DNA first. This in turn led the Association of Chief Police Officers in England and Wales to recommend

that chief constables suspend its use in criminal investigations while a review was carried out by the CPS. That CPS review however concluded that low copy number DNA analysis provided by the Forensic Science Service should remain as potentially admissible evidence.
[91] Professor Jamieson, the expert whose evidence we are urged to admit here, was and is a determined opponent of LCN evidence. He was apparently invited to make his views known to the authors of the Caddy Report but declined to do so.
[92] During the hearing before us Mr Pike very properly alerted the Court to the fact that an appeal relating to LCN DNA was before the Court of Appeal of England and Wales. We obtained the newspaper report of the judgment in the *London Times*, and the Crown forwarded a copy of the judgment when it was released.[23]
[93] That judgment has a detailed discussion of the circumstances in which the reliability and evidential value of Low Template DNA profiles obtained through the LCN process should properly be able to be called into question.
[94] The Court noted that in the LCN process, DNA is copied using 34 cycles in the PCR process as opposed to the 28 cycles used in the standard SGM+ test. The objective is to produce increased sensitivity and a stronger result from Low Template DNA samples.[24] Stochastic (or statistically random) effects can be produced in the LCN process. These include allelic “drop-out”, allelic “drop-in” and an increase in stutter.
[95] The Court in *Reed & Garmson* discussed the stochastic threshold as follows:[25]

... the threshold below which stochastic effects can be produced is at present accepted to be between 100 and 200 picograms – a picogram is one million millionths of a gram - roughly equivalent to a ten millionth of a grain of salt. Above that threshold (often called the stochastic threshold), the stochastic effect should not affect the reliability of the DNA profile obtained. Below that stochastic threshold the electrophoretograms may be capable of producing a reliable profile, if for example there is reproducibility between the two runs.

However, the stochastic effects may be such that no reliable profile can be generated. The FSS had found that in a very high proportion of profiles obtained using the LCN process the profiles were not capable of robust and reliable interpretation because of stochastic variations.

[96] The Court articulated its position “on the present state of scientific development” thus:[26]

(i) Low Template DNA can be used to obtain profiles capable of reliable interpretation if the quantity of DNA that can be analysed is above the stochastic threshold – that is to say where the profile is unlikely to suffer from stochastic effects ... which prevent proper interpretation of the alleles.

(ii) There is no agreement among scientists as to the precise line where the stochastic threshold should be drawn, but it is between 100 and 200 picograms.

(iii) Above that range, the LCN process used by the FSS can produce electrophoretograms which are capable of reliable interpretation ... a challenge to the validity of the method of analysing Low Template DNA by the LCN process should no longer be permitted at trials where the quantity of DNA analysed is above the stochastic threshold of 100-200 picograms in the absence of new scientific evidence. A challenge should only be permitted where new scientific evidence is properly put before the trial court at a Plea and Case Management Hearing (PCMH) or other pre-trial hearing for detailed consideration by the judge ...

(iv) As we have mentioned, it is now the practice of the FSS to quantify the amount of DNA before testing. There should be no difficulty therefore in ascertaining the quantity and thus whether it is above the range where it is accepted that stochastic effects should not prevent proper interpretation of a profile.

(v) There may be cases where reliance is placed on a profile obtained where the quantity of DNA analysed is within the range of 100-200 picograms where there is disagreement on the stochastic threshold on the present state of the science. We would anticipate that such cases would be rare and that, in any event, the scientific disagreement will be resolved as the science of DNA profiling develops. If such a case arises, expert evidence must be given as to whether in the particular case, a reliable interpretation can be made. ...

[97] Three points can be made about this decision. First, it is apparent that the Court of Appeal of England and Wales accepted that at least under defined conditions Low Template DNA can form admissible profiles, capable of reliable interpretation. Indeed, during the course of the *Reed & Garmson* appeals both appellants *abandoned* their general attack on the reliability of Low Template evidence using the LCN process.[27] Second, the Court of Appeal of England and Wales prescribed what might be called a "safety" floor limit. Above the range described by that Court as being a stochastic threshold of 100 and 200 picograms results can be so produced which are capable of reliable interpretation. Third, in the view of that Court a challenge to the validity of the method of analysing DNA by the LCN process *should no longer be permitted* where the threshold limit is exceeded.
[98] Mr King's submissions in this case have not been entirely clear. Sometimes the argument seems to have been that LCN evidence should not be permitted *at all*, and sometimes that there are particular difficulties pertaining to such evidence in this case. In fairness to Mr King, much of this difficulty stems from the fact that the material filed by Professor Jamieson is still patently opposed to LCN evidence per se.
[99] We will come to the particular evidence shortly, but on the current state of the law, we consider that blanket attacks on the science as such are not sustainable. LCN evidence was the subject of debate in this Court in *R v Lepper*, where the proposition was advanced that LCN DNA analysis is unreliable.[28] That proposition has since been specifically rejected by this Court.[29] Crown counsel note that LCN analysis has been accepted in trial evidence in the USA, UK, Australia and Sweden.[30] The qualifier in *Reed & Garmson* is the threshold level set by the Court of Appeal. Since that decision the Supreme Court for the State of New York (a trial court) has held that LCN DNA testing

under the New York OCME protocols is admissible, as being generally accepted “as reliable in the forensic science community”.[31]
[100] It follows in our view that any challenge must be to reliability in the particular case.

The particular problem in this case

[101] We turn now to the technical problems in relation to the particular evidence at trial, and the affidavits adduced on the appeal. We regret the further complexity of this material, but the issue again needs to be set in context.
[102] Mixtures of DNA from two or more individuals are quite common in some types of forensic cases. This has to be dealt with in the interpretation of the DNA profile. The analyst who has to evaluate the evidence must first decide whether the source of the DNA in the questioned sample is from a single individual or more than one person. Essentially, this may be revealed by examination of the number of alleles detected at each locus, as well as severely imbalanced peak height ratios, or pronounced peaks in what is called the stutter position. To be clear on those terms, an allele is an alternative form of a gene or a section of DNA at a particular genetic location (locus); typically multiple alleles are possible for each STR marker. Stutter refers to the calculation of the proportion of a stutter peak height to the parent peak height. There is also the problem of “drop-in”: small pieces of DNA present in the environment can contaminate the tube containing the DNA extract. If there are only a few DNA molecules present from the crime scene then the following pieces of DNA can form a significant proportion of the product and may be the same height as the true sample DNA components.
[103] The dispute between the scientists in this case is as to how, against this complexity, an *interpretation* can and should be done. As to the material on Ms Brauer’s boots, for instance, the heart of the evidence for the appellant is that, of the five markers which were said to provide a statistical probability for the DNA found on the boots to have come from Mr Wallace, three were unable to be reproduced and may not have been reliable signals at all. The argument is that they should not therefore have been included in the partial profile adopted for comparison against Mr Wallace’s profile.
[104] As to the metal bar, Professor Jamieson’s reading was that:

The most obvious and, in my opinion, reasonable evaluation of the DNA result from the metal bar in this case is that they represent DNA from single sources. Only one of the profiles (from inside of the bar) matches Ms Brauer. However, the match is only at 3 alleles and many other people will match those alleles. The other profile (outside) does not match Ms Brauer. They are possibly from the same single source as they share 2 alleles. That single source, because of the remainder of the profile, is not Ms Brauer. Although it is possible that the profiles are a mixture, with one of the contributors being Ms Brauer, this requires the creation of several assumptions which are not the most obvious or likely premises, and which contradict standard practice in public search. Such a hypothesis also leaves two unexplained alleles. In my opinion, as a minimum, the different explanations for the DNA evidence should have been described to the court.

[105] We repeat that there is not here a difference as to the potential applicability of the science. It is not a “bad science” argument as such, which seems to have been the initial

tack for the appellant. The difference is as to what is able to be read from what evidence was available. In everyday lawyer's terms, it is a dispute as to interpretation. The post-trial expert for Mr Wallace now says the trial expert for the Crown got that wrong, or could not give a satisfactory final answer.

The implications of Reed & Garmson for this case

[106] We have indicated that after the hearing had concluded the decision of the Court of Appeal of England and Wales in *Reed & Garmson* came to our attention. In light of the observations of that Court we have endeavoured to determine whether the LCN analysis of the metal bar DNA in *Wallace* was above the stochastic threshold of 100-200 picograms discussed in *Reed*. To help get one's mind around the practicalities of that level, as we apprehend it, that range is something like 16–33 cells.
[107] As we read the record, neither Dr Whitaker's nor Professor Jamieson's evidence detailed the quantity of DNA analysed in terms of picograms. Perhaps it could have been expected that there would be a picogram count in the first instance ESR analysis, before samples were sent to an expert. However, LCN analysis was only introduced at ESR in New Zealand in November 2006. The samples extracted from the metal bar were sent directly to Dr Whitaker, a LCN expert in the United Kingdom. He received the samples on 26 July 2006.
[108] Dr Whitaker's witness statement is dated 13 October 2006. That statement contains an Appendix 2 entitled "Summary of LCN DNA profiling results". However, that table only contains the DNA allele band types. It does not have a picogram count. In short, we were not able to locate in the trial file, or in the Case on Appeal, any picogram counts.
[109] Professor Jamieson's statement of 5 April 2009 dealing with the DNA quantification in *Wallace* dealt with this matter somewhat obliquely:

DNA is contained in cells. These cells are of the order of micrometres. About 10,000 are reckoned to be able to fit on the head of a pin. It is therefore entirely possible that the cells from different people, especially at the extremely low numbers involved in this case (evidenced by the clear stochastic effects in the DNA tests) could be expected to occupy different areas of the bar.

[110] As we read this, there was therefore a reference to stochastic effects by Professor Jamieson but on what we had it was not clear whether these effects were occurring above or below the picogram threshold articulated in *Reed*.
[111] Professor Jamieson's briefing document on the validation and use of LCN did discuss stochastic effects in general. There he rejected a "sliding scale" conception, where there is a linear and direct correlation between effect and concentration:

The essential fact remains that as the amount of starting DNA reduces the reliability of the accuracy of the result reduces, inasmuch as the analysis being able to correctly identify all of the components of a mixture ...

To know the degree to which stochastic effects may be influencing results requires: (a) establishment of the degree of stochastic effect at each concentration by sufficient

experimentation; (b) the starting concentration. Neither of these is known with casework samples.

[112] We therefore invited counsel to check whether our understanding that there was not in this case an analysis of the amount of DNA was correct. They confirmed this to be so. To put this another way, the Low Template DNA in this case was never quantified. It follows that *Reed* is of limited value in this instance. It is useful for its discussion of the problems in this area of forensic science, but for this case the critical question is: was the evidence before the Court sufficiently reliable? On the face of things, it was – its character was attested to, at trial, by properly qualified experts, and not challenged. The attempt to displace that evidence has been made post-trial.

Application of the legal standard for fresh evidence

[113] The question for this Court then, on what is in front of it, is whether Professor Jamieson's affidavit in relation to LCN evidence and Dr Geursen's affidavit in relation to Y-STR evidence have the necessary cogency to be admitted. While they are not relevantly fresh, are they so compelling as to raise an issue going to a real possibility of a miscarriage of justice? In our view, the answer to that question is unquestionably, no.
[114] There is certainly a "lis" between Dr Whittaker and Dr Harbison on the one hand and Professor Jamieson and Dr Geursen on the other. This Court is not in a position to say who, at the end of the day, is correct in a scientific sense. Then too, the science is moving on apace. This Court does not have the expertise, and in any event it is not ultimately the role of this Court, to come to any such determination.
[115] We dispose of the matter on the footing that we are not convinced of the cogency of the "fresh" evidence put before us. Further, as individual items of evidence, the Crown boot and metal bar DNA evidence are not strong. It was not suggested at trial, nor is it suggested now, that they fell below the necessary level for admissibility under the Evidence Act. And the concomitant danger – that they might be accorded too much weight – was guarded against by the Judge in the manner we have noted.[32] It was specifically pointed out to the jury that this evidence is not nearly of the same qualitative order as the cigarette butt DNA evidence.

In any event: a miscarriage of justice?

[116] We have therefore reached the position in our analysis where neither a generalised attack on LCN evidence nor an attack on the reliability of the interpretation, on the basis of the "fresh evidence" actually adduced on this appeal, succeeds.
[117] It is important not to lose sight of the fact that this forensic evidence did not feature strongly at the trial. In the context of the trial it was relatively low key evidence which has been hugely elevated in a post-trial context, but in reality is not of great moment.
[118] If it is assumed, for the purposes of argument, that the forensic evidence relating to the bar had not been before the trial Court, we do not think that the verdict of the jury could have been impugned as being against the weight of evidence or as unreasonable. And when it was included at trial, on the basis on which it was put forward, it was hardly the kind of material which could be said to give rise to Lawton LJ's concern. In this case,

the DNA evidence was but one very small factor. The wealth of circumstantial and identification evidence, when considered alongside the Crown's sound and appropriately qualified forensic analysis which has not been challenged, reveal no prospect of a miscarriage of justice. The Crown did not adduce DNA evidence as proof of the identity of the killer. Rather, the DNA evidence added to a circumstantial case that strongly associated Mr Wallace with Ms Brauer at or about the time and place of her death.

The sentence appeal

[119] Mr Wallace was sentenced by Cooper J to life imprisonment with a minimum period of imprisonment (MPI) of 18 years.
[120] At sentencing, the Crown and Mr Wallace's counsel were some distance apart in relation to the appropriate MPI. The Crown submitted that s 104 of the Sentencing Act 2002 was triggered. Ms Hughes argued for the threshold MPI of ten years which is provided for under s 103(2) of the Sentencing Act 2002.
[121] The arguments which were run before us are a retraverse of those which were run before Cooper J in the High Court.
[122] Cooper J applied the two-step test articulated by this Court in *R v Williams*.[33] He accepted a Crown submission that s 104(e) of the Sentencing Act 2002 was engaged, in that the appellant's murder was "committed with a high level of brutality, cruelty, depravity, or callousness".
[123] Mr King's submission was that Mr Wallace's infliction of multiple blows with a heavy, blunt object was not "brutal". He relied on a decision which is routinely trotted out in these sorts of cases, in which this Court said "there is no such thing as a murder which is not, in some sense, brutal, cruel, depraved or callous".[34]
[124] With respect, Mr Pike was absolutely right: here, there was a ferocious attack utilising the metal bar that rendered Ms Brauer helpless. As Mr Pike put it, she was then "clinically dispatched" with the knife.
[125] We agree with Cooper J's conclusion that s 104(d) of the Sentencing Act also applied. Mr Wallace had a previous conviction for rape. The Crown's theory of the case was that the partially clad nature in which Ms Brauer was found indicated that he had taken preparatory steps to have sexual intercourse with her but something had occurred to interrupt that endeavour.
[126] Mr Wallace had a lengthy and significant criminal history. This in itself was a powerful aggravating feature. There were no mitigating features pertaining to the offending or Mr Wallace as the offender to be taken into account.
[127] It has not been demonstrated that there was any error of principle or application on the Judge's part; on the contrary, in our view, the sentence was well within the range available.

Conclusion

[128] We dismiss the application to adduce further evidence.
[129] We dismiss the appeal against conviction.
[130] We dismiss the sentence appeal.

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[1] HC New Plymouth CRI-2006-043-00292, 5 October 2007.
[2] See [61] – [62] below.
[3] At [42] (emphasis added).
[4] *R v Turner* [1975] QB 834 (CA) at 841.
[5] *R v Andrews* [2008] EWCA Crim 2908, [2009] 1 WLR 1947 at [25].
[6] *R v Sungsuwan* [2005] NZSC 57, [2006] 1 NZLR 730.

[7] *R v Gwaze* [2009] NZSC 115. The case under appeal is *R v Gwaze* [2009] NZCA 430, (2009) 24 CRNZ 348. And as Steyn LJ said in *R v Clarke* [1995] 2 Cr App R 425 at 429: "It would be wrong to deny to the law of evidence the advances to be gained from new techniques and new advances in science."

[8] Paul Kirk *Crime Investigation: Physical Evidence and the Police Laboratory* (2nd ed, John Wiley & Sons, New York, 1974) at 2.
[9] At [62].
[10] At [62].
[11] At [81].
[12] *R v Carter* (2005) 22 CRNZ 476 (CA).
[13] At [41].

[14] See United States Department of Justice and Office of the Inspector General *A Review of the FBI's Handling of the Brandon Mayfield Case* (Oversight and Review Division, Washington, 2006). See also Robert B Stacey "A Report on the Erroneous Fingerprint Individualisation in the Madrid Train Bombing Case" (2004) 54 J Forensic Investigation 706.

[15] See generally Joseph Wambough *The Blooding: True Story of the Narborough Village Murders* (Bantam Press, London, 1989).

[16] Jim Fraser and Robin Williams (eds) *Handbook of Forensic Science* (Willan Publishing, Devon, 2009) at 624.

[17] See Peter Gill and John Buckleton "Biological Basis for DNA Evidence" in John Buckleton, Christopher M Triggs and Simon J Walsh (eds) *Forensic DNA Evidence Interpretation* (CRC Press, New York, 2005) 1 at 8.

[18] John M Butler *Fundamentals of Forensic DNA Typing* (Academic Press, New York, 2010) at 433.
[19] At 433.

[20] See Ian W Evett and others "DNA profiling: A discussion of issues relating to the reporting of very small match probabilities" [2000] Crim LR 341. See also Ian W Evett and others "Interpreting Small Quantities of DNA: The Hierarchy of Propositions and the Use of Bayesian Networks" (2002) 47 J Forensic Sci 520.

[21] *R v Doheny* [1997] 1 Cr App R 369 (CA); Bernard Robertson and Tony Vignaux have made a distinct contribution to this debate. See, amongst their writings, *Interpreting Evidence: Evaluating Forensic Science in the Courtroom* (1995) and "Probability – The Logic of the Law" (1993) 13 Oxford J Legal Studies 457. They emphasise that Bayesian reasoning is simply a formalisation of generally applicable logic, and properly handled, should not pose undue problems for courts.

[22] *R v Hoey* [2007] NICC 49. See also Sean O'Neill "Defence lawyers ready to seize on DNA doubts" *The Times* (United Kingdom, 24 January 2008).
[23] *R v Reed & Garmson* (2009) EWCA Crim 2698 (*Reed & Garmson*).
[24] At [47].
[25] At [48] – [49].
[26] At [74].
[27] The circumstances under which they did so are fully set out in *Reed*.
[28] *R v Lepper* CA334/04, 1 November 2005.
[29] See also *R v Reid* [2009] NZCA 281 at [43].
[30] See the instances traversed in *Reed & Garmson*.
[31] *New York v Hemant Megnath* Ind. No. 917/2007, 8 Feb 2010.
[32] See above at [41].
[33] *R v Williams* [2005] 2 NZLR 506 (CA).
[34] *R v Slade* [2005] 2 NZLR 526 (CA) at [40].