

Issues concerning DNA Evidence

Judge P.E. Smith¹

Introduction

Originally this session was to focus on DNA evidence. I was interested in the topic.

As a criminal lawyer I had on occasions received briefs where the only evidence against the accused was that of fingerprints. Of course the recourse in such a case was to make a no case submission to the court if that was the only evidence, relying on cases such as *R v Barbera*² and *R v Court*.³

Of course there was no good reason why such a principle did not apply to DNA evidence. I happened across the High Court decision of *Fitzgerald v R*⁴ (discussed below) and hence have decided to discuss DNA evidence generally and how it is relevant to various aspects of the criminal law.

DNA – general

DNA evidence relies on the statistical probability that a particular set of genetic markers found on a crime scene sample, do or do not match that of an accused person. DNA evidence is the profiling of bodily tissues and fluids taken from a crime scene, crosschecked on a computer database, to effectively find “a match” of DNA with that of a suspect.⁵

¹ Judge Administrator of the District Court of Queensland.

² [1972] 1 NSWLR 612

³ (1960)Cr. App. Rep 242

⁴ (2013) 311 ALR 158; [2014] HCA 28

⁵ Judge Andrew Haesler SC, *Issues in Gathering, Interpreting and Delivering DNA Evidence*, Presented at the Expert Evidence Conference Canberra February 2011

The general rule as to the admission of DNA evidence is that results expressed as an exclusion percentage will only be admissible when accompanied by a frequency ratio.⁶ An example of exclusion percentage is that 99.9% of the population would not share the same DNA profile; a frequency ratio based on these numbers would be that one in 1,600 people would share the same DNA profile.⁷

Issues with DNA evidence have been the subject of many appeals in recent times. Often arising are questions on whether the judicial discretion to admit DNA evidence was exercised correctly; whether the expert witness presented the evidence in an admissible form, and whether the trial judge gave the jury proper directions as to the DNA evidence.⁸

Hence I would like to address the following five issues in this paper:

1. Provisions of the *Evidence Act*.
2. The use of DNA evidence, and whether proof beyond a reasonable doubt can be achieved in such cases to justify guilt. This will be addressed in context of the High Court decision of *Fitzgerald v The Queen* (*supra*).
3. Presenting statistical evidence at trial may confuse or mislead a jury - this issue will be addressed in the context of *Aytugrul v The Queen*⁹ and *Karger v The Queen*.¹⁰
4. The directions which should be given to the jury.

⁶ John Forbes, *Evidence Law in Queensland* (Thomson Reuters, 9th ed, 2012) 41.

⁷ Liam O'Brien, *Splitting Hairs: Aytugrul v The Queen*

<<http://www.law.monash.edu/about-us/publications/monlr/issues/past/40-1/obrien.pdf>>

⁸ Urbas, Gregor, *DNA Evidence In Criminal Appeals and Post-Conviction Inquiries: Are new forms of review required?*

<<http://www.austlii.edu.au/au/journals/MqLawJl/2002/6.html>>

⁹ (2012) 247 CLR 170; [2012] HCA 15

¹⁰ (2002) 83 SASR 135; [2002] SASC 294. SL refused see [2004] HCA Trans 128

5. Circumstances in which DNA evidence or evidence about DNA can be excluded.

1 – Evidence Act

Practitioners should bear in mind there are specific provisions in the *Evidence Act 1977* (Q) relating to the admission of DNA evidence.

Section 95A provides:

“95A DNA evidentiary certificate

- (1) This section applies to a criminal proceeding.
- (2) A certificate, in the approved form, purporting to be signed by a DNA analyst and stating any of the following matters is evidence of the matter—
 - (a) that a stated thing was received at a stated laboratory on a stated day;
 - (b) that the thing was tested at the laboratory on a stated day or between stated days;
 - (c) that a stated DNA profile has been obtained from the thing;
 - (d) that the DNA analyst—
 - (i) examined the laboratory's records relating to the receipt, storage and testing of the thing, including any test process that was done by someone other than the DNA analyst; and
 - (ii) confirms that the records indicate that all quality assurance procedures for the receipt, storage and testing of the thing that were in place in the laboratory at the time of the test were complied with.
- (3) If a party intends to rely on the certificate, the party must—
 - (a) at least 10 business days before the hearing day, give a copy of the certificate to each other party; and
 - (b) at the hearing, call the DNA analyst to give evidence.
- (4) If the responsible person for the laboratory receives a written request from a party for a copy of the laboratory's records relating to the receipt, storage and testing of the thing, the responsible person must give

the party a copy of the records within 7 business days after receiving the request.

- (5) If a party intends to challenge a matter stated in the certificate, the party must, at least 3 business days before the hearing day, give the responsible person and each other party notice, in the approved form, of the matter to be challenged.
- (6) A party challenging a matter stated in the certificate may, with the leave of the court, require the party relying on the certificate to call any person involved in the receipt, storage or testing of the thing to give evidence at the hearing.
- (7) The court may give leave only if the court is satisfied that—
 - (a) an irregularity may exist in relation to the receipt, storage or testing of the thing about which the person to be called is able to give evidence; or
 - (b) it is in the interests of justice that the person be called to give evidence.
- (8) Any equipment used in testing the thing at the laboratory is to be taken to have given accurate results in the absence of evidence to the contrary.
- (9) In this section—

DNA analyst means a person who holds an appointment as a DNA analyst under section 133A.

DNA profile means the result from DNA analysis.

hearing day means the day fixed for the start of the hearing of the proceeding.

party means the prosecution or a person charged in the proceeding.

responsible person, for a laboratory, means—

- (a) if the commissioner of the police service has entered into a DNA arrangement with the laboratory under the *Police Powers and Responsibilities Act 2000*, section 488B(1)—the chief executive officer, however described, of the laboratory; or
- (b) otherwise—the chief executive of the department within which the *Hospital and Health Boards Act 2011* is administered.”

In my view where DNA evidence constitutes a significant part of the prosecution case then lawyers should obtain another DNA report to check on the accuracy of the DNA evidence. At the least your own DNA expert will provides tips on matters to raise in cross-examination.

Needless to say practitioners will need to be aware of the provisions of s95A when preparing for trial.

2 – *Fitzgerald v The Queen*- is DNA evidence alone enough to secure a conviction?

In *Fitzgerald v The Queen*¹¹ an issue was raised on whether DNA evidence alone was sufficient to prove beyond a reasonable doubt, participation and presence of the accused for purposes of joint liability.¹²

In *Fitzgerald* a group of men forced their way into a house in Adelaide and attacked the occupants. One died a few days later. A didgeridoo was found at the scene with the accused's DNA on it. The appellant's DNA was excluded from other items at the scene. As to the didgeridoo on one sample the appellant was a major contributor although there was an unknown minor contributor. The appellant did not give evidence. Evidence was given by the DNA expert that sometimes a secondary transfer of DNA may occur e.g. during a handshake. There was evidence the appellant's co-accused Sumner had visited the house shortly before the attack and was there during the attack

The High Court held at [36]:

“On Dr Henry's evidence, including that extracted above, the prosecution's main contention, that the appellant's DNA in

¹¹ (2013) 311 ALR 158; [2014] HCA 28

¹² *Ibid* at [27]

Sample 3B derived from the appellant's blood, was not made out beyond reasonable doubt. Secondly, Dr Henry's evidence was not that secondary transfer of DNA was 'rare'; rather, she said that a primary transfer is a much more likely source of contact or trace DNA than a secondary transfer, but that nevertheless a secondary transfer of contact or trace DNA is possible. There was no conflict in the evidence that there were at least two distinct occasions, described above, on which a secondary transfer of the appellant's DNA to the didgeridoo may have occurred. Thirdly, the recovery of the appellant's DNA from the didgeridoo did not raise any inference about the time when or circumstances in which the DNA was deposited there. For those reasons, it could not be accepted that the evidence relied on by the prosecution was sufficient to establish beyond reasonable doubt that the appellant was present at, and participated in, the attack. The jury, acting reasonably, should have entertained a reasonable doubt as to the appellant's guilt. Alternative hypotheses consistent with the appellant's innocence, in particular the hypothesis that Sumner transferred the appellant's DNA to the didgeridoo on Sumner's first visit to the house on the day in question, were not unreasonable and the prosecution had not successfully excluded them. As the evidence was not capable of supporting the appellant's conviction for either offence, no question of an order for a new trial arose."

This case illustrates the need to be prepared for the cross examination of the expert. Literature was referred to as to the length of time DNA could remain.

It also illustrates the need for counsel to consider carefully whether indeed there is a case to answer when confronted with DNA evidence.

3 – *Aytugrul v The Queen* and *Karger v The Queen*- Confusion in the presentation of DNA Evidence

It is now necessary to discuss the issue of confusing or even possibly misleading the jury with statistical evidence. This is directly linked to the importance of the trial judge providing proper directions to the jury regarding how such evidence is to be regarded.

In *Aytugrul v The Queen*¹³ the appellant (a man of Turkish origin) was convicted of murdering the deceased. He and the deceased had been in a relationship and it ended more than two years before she was killed. The prosecution alleged that the appellant committed the crime in retaliation for the deceased commencing a relationship with another man.¹⁴ There was evidence he had harassed and stalked her in the months before the death.

At the scene, a hair was found on the thumbnail of the deceased which revealed that that appellant could have been the donor and that 1 in 1600 of the general population would be expected to share this DNA profile and that 99.9% of people would not be expected to have a DNA profile matching the hair. The appellant submitted that the exclusion percentage evidence was not admissible.

Trial counsel did not cross examine the expert about the exclusion percentages but pointed out that at a football match with 16,000 spectators there might be 100 people with the same mitochondrial DNA.

The defence called an expert to say that while the DNA would be expected to be found in 1 person in 1,000 in the non-Turkish population it was between 1 in 50 and 1 in 200 people in the Turkish population.

In the NSW Court of Criminal Appeal McClellan CJ at CL dissented holding that the exclusion percentage figure was “too compelling” and its prejudice outweighed its probative value and should have been excluded. His Honour relied on *R v GK*¹⁵ and *R v JCG*.¹⁶

¹³ (2012) 247 CLR 170; [2012] HCA 15

¹⁴ *Ibid* at [1]

¹⁵ (2001) 53 NSWLR 317

¹⁶ (2001) 127 A Crim R 493.

The majority held that provided the calculations were accurate there was no reason why the evidence was not admissible.

The High Court dismissed the appeal. At [22] it was noted that no attempt had been made at trial to lead evidence that the giving of an exclusion percentage conveyed more to a hearer than the other evidence. In those circumstances it had not been established that the evidence was unfairly prejudicial, misleading or confusing.

This case again highlights the need for counsel to call appropriate evidence at trial or a pre-trial hearing. It also highlights the importance of considering the way in which opinions are expressed to the jury.

I note that no redirection was sought at trial. The trial judge did not refer to the important evidence of the football stadium example. It might have been useful to the defence if he did.

In *Karger v The Queen*¹⁷ the appellant was convicted of murdering the deceased during a sexual attack. There was evidence that on that evening the appellant had made nine unanswered calls to the deceased. Further it was alleged the accused's DNA was found inside the blouse worn by the deceased. Also as to DNA found under the deceased's fingernail, the accused could not be excluded. The chance of another person having that type of DNA was in the order of 1 in 13.

As to the blouse DNA the Crown expert said that the appellant's DNA was at 10 loci. The match probability was 1 in 90 billion.

The defence called 2 DNA experts who said that the possibility of lab error could not be excluded and the "likelihood ratio" was of no relevance.

¹⁷ (2002) 83 SASR 135; [2002] SASC 294

The South Australian Court of Criminal appeal held that the statistical evidence was admissible (see [151]). The Court at [155] adopted the approach taken in *Doheny and Adams*¹⁸ where the Court adopted the procedures and directions to be given concerning DNA evidence as follows:

- “• *The scientist should adduce the evidence of the DNA comparisons between the crime stain and the defendant's sample together with his calculations of the random occurrence ratio.*
- *Whenever DNA evidence is to be adduced the Crown should serve on the defence details as to how the calculations have been carried out which are sufficient to enable the defence to scrutinise the basis of the calculations.*
- *The Forensic Science Service should make available to a defence expert, if requested, the databases upon which the calculations have been based.*
- *Any issue of expert evidence should be identified and, if possible, resolved before trial. This area should be explored by the court in the pre-trial review.*
- *In giving evidence the expert will explain to the jury the nature of the matching DNA characteristics between the DNA in the crime stain and the DNA in the defendant's blood sample.*
- *The expert will, on the basis of empirical statistical data, give the jury the random occurrence ratio - the frequency with which the matching DNA characteristics are likely to be found in the population at large.*
- *Provided that the expert has the necessary data, it may then be appropriate for him to indicate how many people with the matching characteristics are likely to be found in the United Kingdom or a more limited relevant sub-group, for instance, the caucasian, sexually active males in the Manchester area.*
- *It is then for the jury to decide, having regard to all the relevant evidence, whether they are sure that it was the defendant who left the crime stain, or whether it is possible that it was left by someone else with the same matching DNA characteristics.*
- *The expert should not be asked his opinion on the likelihood that it was the defendant who left the crime*

¹⁸ [1997] 1 Cr App R 369

stain, nor when giving evidence should he use terminology which may lead the jury to believe that he is expressing such an opinion.

- *It is inappropriate for an expert to expound a statistical approach to evaluating the likelihood that the defendant left the crime stain, since unnecessary theory and complexity deflect the jury from their proper task.*
- *In the summing-up careful directions are required in respect of any issues of expert evidence and guidance should be given to avoid confusion caused by areas of expert evidence where no real issue exists.*
- *The judge should explain to the jury the relevance of the random occurrence ratio in arriving at their verdict and draw attention to the extraneous evidence which provides the context which gives that ratio its significance, and to that which conflicts with the conclusion that the defendant was responsible for the crime stain.*
- *In relation to the random occurrence ratio, a direction along the following lines may be appropriate, tailored to the facts of the particular case: 'Members of the jury, if you accept the scientific evidence called by the crown this indicates that there are probably only four or five white males in the United Kingdom from whom that semen stain could have come. The defendant is one of them. If that is the position, the decision you have to reach, on all the evidence, is whether you are sure that it was the defendant who left that stain or whether it is possible that it was one of that other small group of men who share the same DNA characteristics.'"*

It was held that the trial judge's directions had accorded with the above.

Also the Court noted that the jury was directed that the DNA evidence was but one part of the case against the defendant. It was part of the circumstantial case.

This was a correct direction (see [187]).

The appellant though argued further that the trial judge should have given a direction misusing against the misuse of statistical evidence. This was because it was submitted the jury would attach undue weight to this evidence and the jury might be overwhelmed by the evidence. There was a real danger the jury might ipso facto determine guilt.

It was held at [16] by Doyle CJ that the jury should be directed that the DNA evidence was not evidence of the probability of the appellant being the source of the DNA. But the statistical evidence is evidence the jury may use in deciding whether the jury was satisfied beyond reasonable doubt that the appellant was the source of the DNA evidence. It is also important for the jury to avoid the so-called “prosecutor’s fallacy” i.e. an automatic conclusion of guilt because the appellant’s DNA is present (see [18]).

However it is not essential the jury be given a warning as to the dangers of misusing statistical evidence (see [29]). Provided the trial judge properly explains how the evidence may be used there is no need for a warning (see [36].) These comments were supported by Gray J at [188].

4 – The Queensland Benchbook direction

The direction contained in the Queensland Benchbook reads as follows:

“The process of identification by DNA profiling is based on the testing of DNA molecules in bodily tissues and bodily fluids such as blood, saliva, and semen. From measurements taken at selected locations, a DNA profile for a sample of bodily tissue or fluid of unknown origin may be obtained and compared with the DNA profile obtained from a sample of bodily tissue or fluid of known origin. If the profiling tests are done correctly and if the profiles match, it may be concluded that the tissue or fluid of unknown origin could come from the same person as the person from whom the tissue or fluid of known origin came.

The matching of the profiles does not establish that the tissue or fluid of unknown origin is from the person from whom the tissue or fluid of known origin came. There is the possibility that the tissue or fluid of unknown origin came from someone else.

The chances of someone’s having a matching profile are calculated from statistical studies. If we leave aside the special case of identical twins who have matching DNA profiles, the chances of someone having a matching profile will, if the statistics are reliable, be very small. In this case, the figure of

one in [number] was calculated. Statistical estimates are the product of scientific and mathematical theory and are not concrete facts.

The prosecution case rests on the results of analyses of [tissue or fluid of unknown origin] on the [object] found on [date] and a sample of the defendant's [tissue or fluid] supplied on [date]. Those analyses were made on [date] and, as you have heard, the DNA profiles obtained matched.

The evidence of that matching is the foundation of the prosecution case, but that evidence will be worthless if the matching resulted from contamination of the [tissue or fluid of unknown origin] by the defendant's [tissue or fluid]. In that event the DNA profile of what appeared to be the [tissue or fluid of unknown origin] would have matched the DNA profile of the defendant's [tissue or fluid] sample because some of the defendant's [tissue or fluid] had been mixed with the [tissue or fluid of unknown origin] swamping it, and thus giving a false matching: the DNA profiles would have matched because they both were of DNA molecules in the defendant's [tissue or fluid]."

There is a further direction contained in the Benchbook which reads:

"Members of the jury, if you accept the scientific evidence called by the Crown this indicates that there are probably only four or five white males in the UK from whom that semen stain could have come. The defendant is one of them. If that is the position, the decision you have to reach, on all the evidence, is whether you are sure that it was the defendant who left that stain or whether it was possible that it was one of that other small group of men who share the same DNA characteristics."

I consider there should also be a direction as to the "prosecutor's fallacy"

Even if the jury is satisfied the accused's DNA was at the crime scene I also consider it important that the trial judge makes it clear that the DNA evidence is part of the circumstantial case. The mere presence of DNA does not definitely prove guilt. Its presence is a circumstance and of course any reasonable hypothesis for its presence must be excluded beyond reasonable doubt.

5 – Exclusion of DNA evidence

The exclusion of DNA evidence has been argued in a number of cases.

As noted above in *Aytugrul* the way in which the exclusion percentage was expressed was argued to be inadmissible.

There are other areas of argument.

As to forensic evidence generally in *R v Lewis*¹⁹ Maurice J stated that:

"Forensic evidence, especially if it goes to a vital issue implicating an accused person in the commission of an offence, may often have a prejudicial effect on the minds of a jury which far outweighs its probative value. The jury, being people without scientific training, may often be impressed by an expert's qualifications, appointments and experience and the confident manner in which he expresses his opinions. And yet it ought not be left to such matters alone to provide a foundation for the jury making an assessment of the probative value of forensic evidence, particularly where there are conflicts in expert testimony, or where it is acknowledged that other experts of more or less equal distinction are unlikely to agree."

Lewis was a case where the NT Court of Appeal allowed an appeal where forensic evidence identifying a suspect from a bite bruise left on a victim's flesh was not established to be scientifically reliable.

In *R v Tran*²⁰ the Crown sought to tender DNA evidence where the Crown expert conceded the identifying bands were very faint and were not capable of statistical weight. McInerney J held that the evidence should be excluded as it was not open to the jury to prefer one expert opinion over the other as the evidence was so unreliable.

Another decision to be considered is the case of *R v Pantoja*²¹ where the appellant had been convicted the murder of his wife. DNA evidence was obtained from vaginal swabs of the Appellant's sister in law. This was relevant to the Appellant's motive to kill his wife. Conflicting expert evidence was given as to the

¹⁹ (1987) 88 FLR 104

²⁰ (1990) 50 A Crim R 233

²¹ (1996) 88 A Crim R 554

interpretation of the results. It was noted at [19] that “...it is important to emphasise that a match obtained by...DNA... between the suspect and the offender does not establish that the two are the one and the same person. It establishes no more than that the accused could be the offender.” It was held as to the statistical evidence that until there was a general acceptance as to the size of databases then objection should be taken as to the admissibility of statistics (see [28]). Where the match is said to be as low as 1 in 792,000 without greater knowledge as to the size of the database then this evidence may have overawed the jury and may have been greater weight than it was capable of bearing (see [29]). It was held that the statistical evidence should have been excluded (see [36]).

In *R v Juric* [2003] VSC 382 the defendant had been convicted of murder at his first trial in 1998. This conviction was set aside on appeal and a retrial ordered. There was then a hung jury and the third trial commenced before Nettle J.

At the first trial, over objection, the trial judge admitted DNA evidence found in a latex glove tip in the deceased's motor vehicle shortly after his death. There were two sets of tests relied on. One lot was conducted in 1996 and the second in 1998.

There was conflict between the Crown and defence experts as to the reliability of these tests. Contamination was observed in some of the 1996 tests but the Crown experts alleged that this contamination was not present in all of the 1996 tests and the 1998 tests. The defence expert on the other hand said that all of the results were unreliable.

The trial judge at the first trial admitted all tests.

The Court of Appeal²² ruled that the trial judge was in error in admitting the 1998 test results but not concerning the 1996 test results. As to the 1998 test results the court held that it was not to be put to the jury, as it was unlikely they could evaluate the conflicting expert opinions surrounding it and therefore decide if it was reliable beyond a reasonable doubt.²³ The Crown expert had conceded in evidence that caution should be applied in reading the 1998 tests as it was “difficult to attach any meaningful statistics to these typings”. Accordingly the court of appeal held there was no “underlying basis of fact or science which would enable a reasonable jury to adequately assess the strength of an opinion ... that the accused could not be excluded as a contributor to the material tested.”

After the appeal but by the time of the second trial, a further report was obtained by another defence expert who opined that all of the 1996 tests were potentially unreliable. In light of this the Crown did not seek to lead any of the 1996 test results at the second trial.

However by the time of the third trial the 1996 test results were re-examined and it was determined that one result could be relied on and that it was 20 times more likely the DNA came from the deceased and the accused than it came from the deceased and another person drawn from the Victorian Caucasian population.

Nettle J held at [39] that whatever doubts were cast on the 1996 test he did not accept that it was enough to deprive it of its probative value. It was open to a jury to come to the view the results could be relied upon. As to any prejudice his honour came to the view that one had to consider the other facts alleged against

²² (2002) 4 VR 411

²³ Ibid [18].

the defendant – the DNA evidence was not the only evidence (see [64]). In the circumstances any prejudice did not outweigh its probative value.

However his Honour took a different view as to the statistical evidence. His Honour concluded that the statistical evidence reached the point where it was misleading and/or confusing to permit that evidence to be lead (see [71]). The fact is evidence that the DNA was 20 times more likely to come from the accused meant in point of fact a match ratio of 1 in 20 which was not greater than nil (see [72].) His Honour ruled that evidence inadmissible.

Nettle J illustrated how DNA evidence may be excluded on the basis that it has a high likelihood of confusing or misleading the jury. But just because evidence has a potential to confuse a jury, does not automatically mean that it should be excluded, as sometimes this obstacle can be overcome by adequate direction.

Sometimes there comes a point where statistical evidence can become so confusing, that whatever directions are given about it will subsequently result in its probative value being exceeded by prejudice to the accused; it is at this point that the exclusion should occur.

In *R v Berry and Wenitong*²⁴ the Victorian Court of Appeal dismissed the appellants' appeals against their convictions for murder of a fellow inmate.

It was alleged by the appellants that the trial judge erred in admitting into evidence a DNA analysis of a sock found and expert evidence of likelihood ratio calculations. The sock contained the DNA of at least four people. The deceased and the applicants could not be excluded as contributing to the DNA on the sock. It was argued that the DNA of Ali Ali was found on the sock. He was not present

²⁴ (2007) 17 VR 153; [2007] VSCA 202

at the time of the deceased's death. Certain of Ali Ali's alleles matched the applicant's (Wenitong). Therefore the analysis was irrelevant and should have been excluded ([22]).

The Crown evidence was that the major contributor was Ali. Neither the deceased nor the first or second applicants could be excluded as contributors. The Crown expert also said that the DNA evidence was at least 95 times more likely to occur if Ali, the deceased, the applicants and an unknown person were the source of the DNA than if it was Ali, the deceased and 2 or more unknown individuals.

It was submitted that the "likelihood ratio" evidence was not admissible as the DNA analysis did not enable such a calculation to be undertaken and the jury would not be able to resolve the conflict between the prosecution and the defence witnesses. (see [27]).

As to the first point the Court held at [38] there was no error in admitting the evidence of the likelihood ratio as the statistical calculations of the Crown expert and the defence expert gave the DNA evidence its probative value as it "provided the jury with assistance as to the weight which they might choose to attach to the DNA evidence."

On the second point the court considered the cases of *Karger, Tran and Juric*. It was said at [43] that "it could not be said that this was a case in which the jury was unable to evaluate the DNA evidence or resolve the conflict between experts."

Another point raised on appeal was the trial judge failed to direct the jury that the presence of the DNA meant only that the applicant's DNA was on the items in question and the DNA evidence could not and did not disclose how or when it

came to be there. This ground was dismissed on the basis the trial judge gave a circumstantial evidence direction and the evidence was clearly explained to the jury (see [49]-[51]). On the issue of whether a *Shepherd*²⁵ direction ought to have been given it was said that what Nettle J said in *Juric* at [62] was correct namely:

“In most of these cases it has been assumed or it has been clear that the fact sought to be established by the use of DNA evidence in question was an indispensable link in the chain of logic leading to conviction, in the strict sense essayed in Shepherd v The Queen. If DNA evidence is the only evidence of such a fact and perhaps also where any other evidence of the fact is “weak” in the sense in which that word was used by Hunt CJ at CL in Pantoja, it is to be expected that the jury will be instructed that they must be satisfied beyond reasonable doubt of the reliability of DNA evidence before they could be satisfied of the fact sought to be proved. But as Hunt CJ at CL pointed out, it is otherwise where there is other evidence of the fact sought to be proved and it is open to the jury on the basis of the totality of the evidence to be satisfied of the fact beyond reasonable doubt, even if none of the individual pieces of evidence relied upon has that effect. BJ James J makes the same point in the second Pantoja appeal and his Honour’s analysis was expressly approved by Batt JA, with whom Phillips CJ and Callaway JA agreed, in R v Kotzman.”

I now return to the decisions of *GK* and *JGC* mentioned earlier.

In *R v GK*²⁶ the New South Wales Director of Public Prosecutions referred two questions of law to the New South Wales Court of Criminal Appeal, namely whether the primary judge excluded evidence of the probability in numerical terms derived from DNA testing that the accused was the father of the complainant’s child. It was held that the paternity index figures should have gone to the jury but with appropriate directions of the need to avoid the prosecutor’s fallacy.

It was further held the trial judge was correct to exclude “the relative chance of paternity statistics”.

²⁵ *Shepherd v R* (1990) 170 CLR 573

²⁶ (2001) 53 NSWLR 317. Note the plurality questioned *GK* in *Aytugral* at [30] whilst Heydon J distinguished it see [75].

In *GK* the appellant was charged with counts of sexual assault on his step daughter. It was alleged she had given birth to his baby. The paternity index figure was 220,000:1. The chance figure was 99.9995%.

At [59] Mason P said:

“It follows that the paternity index figures should not have been withheld from the jury pursuant to s 137 of the Evidence Act. They should have gone to the jury accompanied by appropriate directions emphasising the need to avoid the prosecutor’s fallacy. This appeal is not the proper vehicle to formulate a model direction in that regard. I content myself with the suggestion that it would be desirable if, at the time the judge tells the jury that evidence of paternity has been expressed as a high or very high probability, the jury should be reminded then and there that the evaluation of that evidence is a matter for them in light of the totality of the expert and non-expert evidence.

*[60] However, I agree with Sully J that the exclusion of the relative chance of paternity percentage was appropriate. I agree with his Honour’s reasons and would add this consideration: Mr Goetz himself recognised that the relative chance of parentage percentage was “more complicated to explain”. I shall not endeavour to explain why, lest I reveal my own misunderstanding of relative chance of paternity expressed as a percentage, beyond observing that part of the difficulty would be removed if 99.9993% was transposed to a statement that there was a 0.0007% probability or chance of C’s father being anyone other than **GK**. Even such adjustment would leave me of the view that the evidence is unduly prejudicial in its impact”.*

It is noteworthy that Spigelman CJ in *R v JCG*²⁷ was critical of the use of exclusionary percentages. His Honour said at [72]:

*“The Crown accepted the reasoning in *GK*. Specifically, the Crown accepted that such evidence was capable of being misleading or confusing within s 135(b) of the Evidence Act 1995. The figures put to the Court in the present case by the Crown were that a Paternity Index of 50 to one would convert into a relative chance of paternity of about 98 percent. This was a submission, not based on expert evidence in the case. However, if a figure of 98 percent were put to a jury, it is likely that many jurors would regard that as very significant evidence pointing to the accused, even though the Paternity Index ratio*

²⁷ (2001) 127 A Crim R 493.

was very low, so that numerous persons in the general community could share the DNA profile.”

In *JCG* the appellant had been convicted of rape of an intellectually impaired person. She became pregnant and the foetus aborted. DNA tests were conducted of the foetus. The Appellant was said to be 2.4. million times likely to the father than a person taken at random from the community. Further the crown expert alleged that the relative chance of paternity was greater than 99.9999%. The proviso was applied as the paternity index was unchallenged.

Conclusion

In conclusion as one can see there are several issues arising with the use of DNA evidence in the courtroom, including difficulties proving guilt where the only available evidence proves fact of itself, a potential to mislead and confuse the jury, and the possible prejudicial effect of DNA evidence.

Counsel should bear these issues in mind when preparing for trial.

DNA evidence is a vital tool used in law enforcement, and provided proper direction is given a jury is perfectly entitled to rely on the DNA evidence.

It is also equally important that evidence lead in a trial not only have probative value but that such probative value exceeds any unfairly prejudicial effect on the defendant and should not confuse or mislead a jury.