

Genetic Justice: DNA Evidence and the Criminal Law in Canada

TREVOR R. McDONALD*

In a forensic setting, ... an innocent suspect has little to fear from DNA evidence, unless he or she has an evil twin.¹

I didn't understand the DNA stuff at all. To me, it was just a waste of time. It was way out there and carried absolutely no weight with me at all.²

I. AN INTRODUCTION TO DNA FORENSIC EVIDENCE

DNA EVIDENCE ... IS THE MOST dramatic forensic evidence ever discovered ...” It was with these words that Kerans J.A. of the Alberta Court of Appeal reaffirmed the second degree murder conviction of Ryan Jason Love for the brutal stabbing of Lucie Turmel, a Banff taxicab driver.³ There was very little evidence to support an indictment in the *Love* case, only a murder weapon and blood stains in the victim's cab. However, DNA tests revealed that not all of the blood belonged to Turmel. Investigators determined that Lucie Turmel had fought hard for her life, and that her attacker had been cut in the struggle. The killer had inadvertently left behind his “genetic fingerprint.”

Police suspected Love, but he refused to provide a sample for comparison. This led police to formulate an investigative ruse in order to obtain bodily material from their suspect. Two young police officers went undercover to get close to Love. During a five week long *friendship*, they managed to obtain a few of the suspect's hairs and an abandoned tissue containing his mucous. DNA testing

* Trevor McDonald is a third year law student at the Faculty of Law, University of Manitoba. The author wishes to acknowledge the valuable assistance and guidance of Professor Anne McGillivray, Faculty of Law, University of Manitoba.

¹ N. Risch & B. Devlin, “On the Probability of Matching DNA Fingerprints” (1992) 255 *Science* 717 at 720.

² Post-trial commentary from a juror in the O.J. Simpson trial: V. Bugliosi, *Outrage* (New York: Dell Publishing, 1996) at 60.

³ R. v. *Love* (1995), 102 C.C.C. (3d) 393 (Alta. C.A.) [hereinafter *Love*].

confirmed the officers' suspicions—Ryan Love's genetic profile matched the profile of the blood found in Turmel's cab.

As this case illustrates, DNA evidence may be the most powerful and reliable forensic evidence since the advent of fingerprint identification. Essentially, DNA typing compares the DNA profile obtained from samples of tissue or bodily fluid found at the crime scene with that of the accused to determine whether they match at certain predetermined locations on the genome. The two main DNA identification procedures currently in use in North American forensic laboratories are the Restriction Fragment Length Polymorphism (RFLP) method and the Polymerase Chain Reaction (PCR) amplification procedure.

Though RFLP testing provides a more accurate indicator of the variability between individuals, and is therefore stronger identification evidence, it is less efficient than PCR methods. While a typical RFLP test may take between five and seven weeks, due to the time it takes to transpose the profiles onto x-ray film, a PCR test can usually be done in less than twenty-four hours.⁴ PCR analysis, because of its amplification capabilities, allows the analyst to extract DNA from minute bodily samples for testing. RFLP testing will usually require a blood stain the size of a dime, but a conclusive PCR result might be obtained using a sample 1/100th the size.⁵

PCR techniques may be the only option when a sample is severely degraded or broken down into smaller fragments. This can occur naturally after long periods of exposure to environmental elements at a crime scene, such as light or heat, or by contamination with chemicals. DNA samples that are badly degraded may not produce conclusive results using the RFLP technique.⁶ When a DNA sample enters a forensic laboratory, the level of degradation must be assessed before an analyst decides which test to run.

In addition, some forensic laboratories, including the United States Federal Bureau of Investigation, utilise a third technique, known as direct sequencing, which enables the analyst to ascertain the exact sequence of base pairs in a portion of DNA. This third method offers the most accurate type of identification evidence in the DNA arsenal to date. The technique of direct sequencing has not been developed to the point where it is commonly used in Canadian criminal cases.⁷

⁴ S. Henahan, "An Interview with DNA Forensics Authority Dr. Bruce Weir," <<http://esg-www.mit.edu:8001/esqqbio/rdna/weirfinger.html>> at 2, (date accessed: 25 September 1997).

⁵ K. Inman & N. Rudin, *An Introduction to Forensic DNA Analysis* (Boca Raton: CRC Press, 1997) at 55.

⁶ *Ibid.* at 102.

⁷ DNA sequencing has been used in at least one U.S. case: *Ware v. State*, [1997] WL 141688 (Tenn. Crim. App.) online: WL (TN-CS).

The complex techniques of DNA typing, which combine principles of molecular biology, population genetics, and statistics, often provide a compelling connection between an accused individual and a particular victim or crime scene. The aura of infallibility that has surrounded this tool of identification since its inception has led countless juries in North America and elsewhere to convict criminal defendants despite, in some cases, a complete absence of corroborating evidence. The scarcity of credible explanations upon a finding of a "DNA match" has resulted in an increase in guilty pleas, particularly for crimes of sexual assault.⁸

DNA evidence, however, has not been used solely to garner convictions. In fact, forensic laboratories in Canada and the United States report that between 22 and 30 percent of tests exonerate suspects. Many inmates have been released from death row in United States prisons after DNA tests excluded them as possible perpetrators of the crimes for which they had been convicted.⁹ As more wrongful convictions are uncovered, attacks on the reliability of eyewitness testimony and other forms of identification have intensified.

The recent exoneration of Canadians Gregory Parsons, Guy Paul Morin, David Milgaard, and others, the Campbell inquiry into the Paul Bernardo case, and, of course, the acquittal of O.J. Simpson in California have all contributed to the high profile of DNA evidence. Yet misperceptions, challenges, and controversy persist.

The Canadian courtroom was first introduced to DNA typing in the 1988 case of *R. v. Parent*,¹⁰ and in the decade since, well over 1 000 cases have been decided in this country with the aid of DNA evidence, which has been alternately described as irrefutable and potentially dangerous. This article will explore the history of DNA identification evidence in Canada and the United States including the development of standards of admissibility, the *Charter of Rights and Freedoms*,¹¹ special problems related to DNA databases and contamination, and legislative action in the current Canadian regime.

⁸ L. Kirby, *DNA Fingerprinting: An Introduction* (New York: Stockton Press, 1990) at 191.

⁹ In 1996, the United States National Institute of Justice released a report entitled *Convicted by Juries, Exonerated by Science*, which cites the cases of twenty-eight prisoners who had been exonerated by DNA testing.

¹⁰ (1988), 46 C.C.C. (3d) 414 (Alta. Q.B.) [hereinafter *Parent*].

¹¹ *Canadian Charter of Rights and Freedoms*, Part I of the *Constitution Act*, 1982, being Schedule B to the *Canada Act* (U.K.), 1982, c. 11 [hereinafter *Charter*].

II. PITCHFORK: THE DEBUT OF DNA EVIDENCE

IN 1983 AND 1986, two young women in adjoining English villages were sexually assaulted and murdered. A 17 year-old youth, Richard Buckland, confessed to the second killing. To corroborate the confession, the police submitted Buckland's sample for comparison against semen samples which had been found on the victims' bodies. However, the tests excluded Buckland as a possible source and he was released, claiming that he had been pressured to confess.

The police then undertook to request and collect a blood sample from every male between the ages of thirteen and thirty in the surrounding area. None of the over 5 500 samples collected matched the suspected murderer's profile.

Investigators were puzzled, until they received a tip about a conversation which had taken place in a local pub. One of the parties had allegedly revealed that he had been persuaded to submit two samples of blood: one in his own name and one in the name of an acquaintance, Colin Pitchfork.

Pitchfork was arrested, and his DNA profile was found to be consistent with that of the semen samples. Pitchfork pleaded guilty to the murders, and the history of DNA criminal identification had begun.¹²

III. DNA EVIDENCE IN AMERICA

A. The Standards

In the United States, there are three different standards of admissibility for scientific evidence at the federal level: the test from *Frye v. United States*,¹³ the *Federal Rules of Evidence*,¹⁴ and the decision in *Daubert v. Merrell Dow Pharmaceuticals*.¹⁵ Each state has adopted one or more of these standards, which are often expressed in a variety of ways.

The *Frye* standard, from 1923, is the most rigid, requiring general acceptance in the particular scientific field. The *Federal Rules of Evidence* afford considerably more discretion to the court, stating that scientific evidence which is relevant, reliable, and more probative than prejudicial will be admitted.

In the 1993 case of *Daubert*, the United States Supreme Court declared that general acceptance is only one of several factors to be considered in assessing reliability and relevance. Other factors include whether the theory or technique has been tested, the extent of peer review and publication, the error rate, and

¹² M. Gelowitz, "DNA Fingerprinting: What's Bred in the Blood" (1988) 65 C.R. 122.

¹³ *Frye v. United States*, 293 F.1 013 (1923) [hereinafter *Frye*].

¹⁴ *Federal Rules of Evidence*, 28 U.S.C. §2072 (1984).

¹⁵ *Daubert v. Merrell Dow Pharmaceuticals*, 133 S. Ct. 2 786 (1989) [hereinafter *Daubert*].

the existence and maintenance of controls and standards.¹⁶ However, no individual state is obligated to adopt the *Daubert* standard.

B. Early American DNA

The American experience with DNA evidence in criminal cases began in 1987, when Tommie Lee Andrews was convicted of the rape of a woman in Florida and sentenced to 22 years in prison.¹⁷ DNA testing results were not seriously challenged until a trio of 1989 cases, *People v. Castro*,¹⁸ *Minnesota v. Schwartz*,¹⁹ and *People v. Martinez*.²⁰

In *Castro*, the quality and reliability of RFLP test results produced by a private forensic laboratory, which had only recently entered the field of DNA testing, were at issue. One of the several points of contention was that the analyst had declared a match despite the unexplained existence of two extraneous DNA fragments. Following their testimony, several of the expert witnesses for both the prosecution and the defence met to discuss the evidence. Together, they submitted a report expressing reservations about the adequacy of the analytical techniques that were used. The Court held that the DNA test results were inadmissible.

Similarly, in *Schwartz*, a private laboratory was again found to have failed to maintain appropriate standards in the quality and execution of its testing procedures. Defendants in several subsequent cases would also successfully challenge the quality of private laboratory tests, resulting in the exclusion of evidence. In *Martinez*, the Court refused to accept the results of PCR testing, as the forensic application of the technique was considered too new and relatively unproven.

C. The DNA Wars

The year 1992 will be remembered as the pinnacle of the “DNA Wars” in the United States. The crux of the debate was the validity of the assumption of “linkage equilibrium,” or random DNA inheritance, which permits use of the product rule when calculating frequency estimates.

One group of scientists insisted that ethnic substructuring within racial population groups could negate this assumption, thereby eroding the reliability of the statistics. The fact that certain population subgroups exhibit particular

¹⁶ R. Nakashima, “DNA Evidence in Criminal Trials: A Defense Attorney’s Primer” (1995) 74 Neb. L. Rev. 444 at 454.

¹⁷ *State v. Andrews*, 533 So.2d 841 (1987).

¹⁸ *People v. Castro*, 144 Misc.2d. 956, (Bronx Co. Ct. 1989) [hereinafter *Castro*].

¹⁹ *Minnesota v. Schwartz*, 447 N.W. 2d 422 (Minn. Sup. Ct. 1989) [hereinafter *Schwartz*].

²⁰ *People v. Martinez*, A70 932, (L.A. Cty. Sup. Ct. 1989) [hereinafter *Martinez*].

genetic traits more often than others, they claimed, is evidence that inheritance of traits is not completely random. Examples include the high occurrence of blue eyes and blond hair among Scandinavian people, or dark hair and olive skin in people of Italian ancestry. An opposing group of scientists countered that such genetic diversity was forensically insignificant, and, moreover, was more than made up for by the conservatism of the frequency calculations.²¹

The culmination of the debate was the controversial 1992 report of the *National Research Council Committee on DNA Technology in Forensic Science*.²² A major recommendation of the report was that an ultra-conservative limit be placed on the calculations of frequencies until more testing could be done on population substructure. This method, termed the *ceiling principle*, was widely and severely criticised in scientific and legal communities as lacking foundation. The scientific wrangling led courts in several *Frye* jurisdictions to conclude that there was no general agreement on DNA techniques, and to therefore rule the evidence inadmissible.

By 1994, one of the main dissenters on the use of population statistics, Eric Lander, along with Bruce Budowle of the FBI, published a joint letter in a scientific journal. The letter proclaimed an end to the "DNA Wars," and declared that all of the issues which would prevent the admissibility of DNA evidence had been resolved through testing, debate in the literature, and standards of quality control.²³

D. Recent History

With relatively few exceptions, it has been demonstrated and accepted that substructuring within populations is infrequent, and that its effect on frequency estimates is negligible. Further, the current methods for estimating the rareness of a genetic profile within a general population adequately compensate for any substructuring that may exist.

If there is evidence that the suspect and other possible sources of the sample likely belong to the same subgroup, statistical modifications can be made. An example would be where a crime is committed in a small, geographically isolated community, the most often mentioned being native reserves. Ordinarily, of course, evidence of a perpetrator's ethnicity would not be available, as even an eyewitness would normally be incapable of ascertaining an individual's ethnic origin, beyond a description of the suspect's major racial group.

²¹ E. Wright, "DNA Evidence: Where We've Been, Where We Are, and Where We Are Going" (1995) 10 *Maine Bar J.* at 5.

²² National Research Council, *DNA Technology in Forensic Science*, (Washington: National Academy Press, 1992).

²³ *Supra* note 5 at 152.

These conclusions are supported by numerous reports, including a 1993 report by the FBI²⁴ and, more significantly, a second report produced in 1996 by the National Research Council (NRC).²⁵ The follow-up report withdrew the Committee's support of the "ceiling principle" and fully endorsed the use of DNA testing for identification purposes, including use of the product rule to estimate frequencies.²⁶

Recent U.S. appellate decisions have, with few exceptions, admitted DNA evidence using RFLP techniques, but challenges based on the issue of population substructure persist.²⁷ PCR evidence has been ruled admissible in twenty American states and in two federal circuits. Two state supreme courts—Arizona and Nebraska—have rejected it.²⁸

Many American jurisdictions have also enacted legislation declaring DNA evidence to be admissible, and several of these statutes further stipulate that probability estimates should be included.²⁹ It is anticipated that the latest NRC report will have a substantial impact on future acceptance of frequency estimates.

IV. THE CANADIAN EXPERIENCE

A. Initial Acceptance

The first Canadian case to employ DNA evidence was the 1988 case of *R. v. Parent*,³⁰ in which a PCR amplification technique was used to exonerate the accused as the perpetrator of a series of sexual assaults in Edmonton. In *Parent*, the DNA evidence was admitted with both parties' consent.

A 1989 decision of the Ontario Court General Division, *R. v. McNally*,³¹ was the first to admit inculpatory evidence of an RFLP match. A qualified ex-

²⁴ Report of the Federal Bureau of Investigation, *VNTR Population Data: A Worldwide Study*. (Washington: Federal Bureau of Investigation, 1993).

²⁵ National Research Council Report II, *The Evolution of Forensic DNA Evidence*. (Washington: National Academy Press, 1996).

²⁶ "DNA Evidence Continues on Trial," *Chemistry & Industry Magazine*. (20 May 1996), online: <<http://ci.mond.org/9610/961006.html>> (last modified: 20 May 1996).

²⁷ See *Inman*, *supra* note 5 at 147.

²⁸ J. Gibeault, "Ruling every which way" (1984) *A.B.A. J.* 40.

²⁹ R. Bell, "Instructing Juries in Genomic Evidence Cases" (1997) 36:3 *The Judges Journal* 42 at 44.

³⁰ *Supra* note 10.

³¹ *R. v. McNally* (14 April 1989), Ottawa (unreported) (Ont. Ct. Gen. Div.) [hereinafter *McNally*].

pert in Canada may offer his or her opinion on an area within his or her expertise, provided that the probative value of that testimony is not substantially outweighed by its prejudicial effect. In admitting the DNA testing results as "novel scientific evidence," the Court used a test of "relevancy and helpfulness to the trier of fact," drawn from Wilson J.'s dissent in the Supreme Court of Canada decision in *R. v. Béland*.³² The accused was convicted of sexually assaulting an elderly woman and was sentenced to seven years in custody.

In *McNally*, and in the case of *R. v. Hunt and Keenan*³³ the following year, expert witnesses for the prosecution were permitted to tender estimates of the probability of a coincidental match. *McNally* was the first case in North America to allow testimony of this nature.

B. Challenging the Probability Estimates

The ground breaking acceptance of DNA probability estimates found in *McNally*, was reconsidered in the 1991 cases of *R. v. Bourguignon*³⁴ and *R. v. Baptiste*.³⁵ In *Bourguignon*, the prosecution sought to introduce DNA evidence to support its theory that the accused had sodomised and strangled his 2 year old nephew. Defence counsel mounted a vigorous attack on the reliability and interpretation of the relatively new identification techniques.

The Ontario Court General Division ruled that although DNA evidence was clearly relevant and helpful to the jury, attaching statistical significance to a match was extremely prejudicial to an accused and thus outweighed its probative value. The concern was that jurors would equate these "fantastic odds" with the likelihood that the accused was guilty of the offence. DNA experts were restricted to describing the strength of the evidence in qualitative terms. Despite this omission, the jury voted to convict.

In *Baptiste*, the accused was charged with first degree murder after a 21 year old woman was sexually assaulted and then beaten to death with a hammer. A blood stain on the accused's blue jeans matched the victim's genetic profile, and semen found in the victim's body was consistent with the accused's DNA profile at two genetic locations. The DNA evidence was found to be relevant, reliable, and helpful to the jury, and was admitted as novel scientific evidence.

No doubt influenced by the decision in *Bourguignon* and the battle being waged south of the border, the prosecution agreed that the expert would connote the strength of the match without attaching numerical significance. The prosecution expert testified, for example, that the possibility that blood stains

³² *R. v. Beland*, [1987] 2 S.C.R. 398.

³³ *R. v. Keenan and Hunt* (10 December 1990), Woodstock 95-03246 (Ont. Ct. Gen. Div.).

³⁴ *R. v. Bourguignon*, [1991] (Ont. Ct. Gen. Div.), aff'd (1997), 118 C.C.C. (3d) 43.

³⁵ *R. v. Baptiste*, [1991] 17 W.C.B. (2d) 453 (B.C.S.C.).

on the accused's blue jeans came from someone other than the victim was *extremely remote*. The accused was convicted of first degree murder, and the admission of the DNA evidence was later upheld by the British Columbia Court of Appeal.³⁶

In 1991, Alain Légère, the “monster of Miramichi,” was brought to trial in New Brunswick. Légère was a convicted murderer who had escaped from prison and was suspected of killing four people while at large. Further, the perpetrator had also sexually assaulted his victims, and semen samples recovered by police matched Légère's DNA profile.

Commenting that the probative value of the evidence outweighed “very substantially” any prejudicial effect, the trial judge in *Légère* admitted both the evidence of the DNA match and the statistical analysis. The trial judge declared that no legitimate purpose could be served by excluding the numerical evidence. For one of the samples, the jury heard evidence that a match at all five genetic markers would be expected to occur only once in every 310 million people tested in the Canadian Caucasian population.³⁷

In instructing the jury on the expert testimony, the trial judge explained:

[T]he frequency figures ... are really of no significance at all anyway because the mere finding of the match makes it exclusive enough that it would be improbable that any-one other than Mr. Légère had contributed the semen.³⁸

The jury convicted Légère of all four murders. Légère appealed his case to the New Brunswick Court of Appeal on several grounds, including the admissibility of the DNA evidence.³⁹ In dismissing Légère's appeal, the Court held that the science underlying DNA testing is sufficiently credible and reliable, and that the evidence is admissible provided that the specific tests used are relevant and helpful to the trier of fact. The jury must then weigh the DNA evidence, along with all the other evidence, in determining if an accused is guilty beyond a reasonable doubt. The decision also stated that it is not necessary for jurors to understand all of the scientific terms and tests involved in order to evaluate the testimony of DNA experts.

Probability calculations were also admitted in the 1993 Newfoundland case of *R. v. Young*.⁴⁰ In *Young*, the accused was charged with numerous offences, including the kidnapping and sexual assault of a young woman, who had been ab-

³⁶ *R. v. Baptiste* (1994), 88 C.C.C. (3d) 211, (B.C.C.A.); appeal allowed on another ground; new trial ordered; convicted 6 May 1996; appeal dismissed: *R. v. Baptiste* (1998), 176 W.A.C. 103 (B.C. C.A.).

³⁷ *R. v. Légère* (29 August 1991), Fredericton 95-04764 (N.B. Q.B.).

³⁸ *R. v. Légère* (1994), 401 A.P.R. 321 (N.B. C.A.).

³⁹ *Ibid.*

⁴⁰ *R. v. Young* (1993), 113 Nfld. & P.E.I.R. 219 (Nfld. T.D.) [hereinafter *Young*].

ducted and attacked after an evening at a local nightclub. The complainant could not accurately identify her assailant, and the accused denied that he was the perpetrator. However, the accused's DNA profile matched the semen sample of the perpetrator at five genetic markers.

An expert witness for the prosecution testified that the estimated frequency of such a match was less than one in 930 million in the Canadian Caucasian population. Mercer J., of the Newfoundland Supreme Court, Trial Division, held that as a result of the DNA evidence, the likelihood of a person other than Young being the donor of the evidentiary samples was found to be "so remote as to be unreasonable to contemplate."⁴¹

A senior counsellor in a group home for the mentally disabled was charged with sexually assaulting a resident in the 1994 Ontario case of *R. v. Jackson*.⁴² DNA evidence corroborated the story of a witness to the offence, who reported seeing the victim on top of the accused, who was attired in only a shirt and his "Saskatchewan Wheat Pool" jacket. The court accepted the statistical evidence, adding that the deductions made from DNA testing are sufficiently established to have gained general acceptance.

In *Jackson*, Stortini J. noted that DNA evidence is not 100 percent conclusive in every case, and that a credible alibi or other defence might leave the court with a reasonable doubt, stating, "there is always someone who will win a lottery despite the frequency tables and individual chances."⁴³ In this case, however, the accused's alibi that he was merely assisting the victim in performing special exercises, and that the semen stain found was the product of a previous wet dream, was found to be a complete fabrication that did not leave the Court with reasonable doubt.

The effect of frequency estimates on the jury were again under attack in the 1994 Alberta Court of Appeal case of *R. v. Imhoff*.⁴⁴ The appellant had been convicted of second degree murder. One ground of appeal was that the trial judge, in charging the jury, should have expressed the match probabilities in qualitative terms. The appellant argued that the use of statistical figures is misleading and overwhelming in that jurors will automatically conclude that a suspect is guilty, without reference to other evidence.

The Court in *Imhoff* dismissed the appeal, stating that the trial judge had properly warned the jurors against using the evidence in this manner, and had even taken the extra precaution of inviting the jurors to use the most conserva-

⁴¹ *Young*, *supra* note 40 at 228.

⁴² *R. v. Jackson* (3 March 1994), Sault Ste. Marie 95-03721 (Ont. Ct. Gen. Div.) [hereinafter *Jackson*].

⁴³ *Ibid.* at 21.

⁴⁴ *R. v. Imhoff* (1994), 83 W.A.C. 148 (Alta. C.A.) [hereinafter *Imhoff*].

tive estimate proposed. The defendant had been given an opportunity to provide an explanation to the Court as to how the victim's blood came to be on his clothing and in his garage, but had not proffered one.

In late 1997, the Ontario Court of Appeal began hearing arguments in the case of *R. v. Terceira*.⁴⁵ The accused, John Carlos Terceira, was convicted in 1993 of the murder of a six-year-old girl, whose body was found in the boiler room of the apartment building where he worked.⁴⁶ Semen stains found on the floor near the victim's body and on her clothing matched the accused's DNA profile, and five expert witnesses were called to testify at trial as to the significance of these matches. Estimated frequencies ranged from one in 1 500 people in the Caucasian population to one in 1.8 million. At trial, DNA was the star witness, providing a strong corroborative link between other circumstantial evidence that would not have stood on its own.

On appeal, counsel for the appellant submitted that the prejudicial impact of DNA calculations far exceeds their probative value, and requested a mandatory requirement that DNA statistical numbers be excluded from criminal trials. Counsel argued that the use of such numbers had likely made an overwhelming impact on the jury.

The Court dismissed Terceira's appeal, and held that the admissibility of probability statistics should properly be left in the discretion of the trial judge, to be decided on a case-by-case basis. Finlayson J.A. stressed that DNA evidence is "but one piece of circumstantial evidence, which taken alone may prove very little."⁴⁷

The Court also addressed the appellant's concerns that perceptions of "mystic infallibility" surround DNA evidence, and that jurors might therefore equate the probability of a random match with the probability of the accused's innocence. Finlayson J.A. wrote that these concerns are largely offset by the availability of DNA samples for independent testing by the defence. This allows the defence the opportunity, where cost is not prohibitive, to call its own experts. In addition, the Court proposed that trial judges would be well advised to:

[I]nstruct the jury not to be overwhelmed by the aura of scientific infallibility associated with scientific evidence. The trial judge should tell them to use their common sense in their assessment of all of the evidence on the DNA issue and determine if it is reliable and valid as a piece of circumstantial evidence.⁴⁸

⁴⁵ (1998), 123 C.C.C. (3d) 1 (Ont. C.A.) [hereinafter *Terceira*].

⁴⁶ T. Claridge "Bar Statistical Probabilities on DNA, Court Urged" *The Globe & Mail* (22 November, 1997) A12.

⁴⁷ *Terceira*, *supra* note 40 at 23.

⁴⁸ *Terceira*, *supra* note 40 at 28.

Counsel for Mr. Terceira has been granted leave to appeal his case to the Supreme Court of Canada.

C. The DNA *Voir Dire*

In the 1992 case of *R. v. Johnston*,⁴⁹ the accused was charged with several offences, including sexual assault. The prosecution provided an outline of its DNA evidence and then applied to the Court to have the evidence admitted without preliminary screening through a *voir dire*. Langdon J. dismissed the application and ordered a *voir dire*, with the issue to be decided on a balance of probabilities, reasoning that DNA evidence involves complex sciences and has the potential to be dispositive of the case. Canadian judicial opinion on DNA evidence was in an embryonic stage in Canada, according to the Court, and there was concern that a false step could result in a mistrial.

The Court in *Johnston* also addressed the admissibility of novel scientific evidence, listing 14 factors for consideration when assessing the reliability or helpfulness of the evidence. These factors include the potential rate of error, the qualifications of the expert, and the general acceptance of the technique by experts in the field. In the *voir dire*, Langdon J. admitted the evidence, but would not allow a numerical expression of the frequency of the profile. Referring to the prejudicial effect of admitting the statistical evidence, Langdon J. stated that it would "lend to the entire process a degree of precision beyond the limits of its technology."⁵⁰

In 1993, the necessity of a *voir dire* in cases involving DNA evidence was again at issue, this time in the sexual assault case of *R. v. Lafferty*.⁵¹ The Supreme Court of the Northwest Territories held that a *voir dire* is required only if the opposition challenges the methodology of the particular test and analysis that was performed, or if a *Charter* violation is alleged. If the collection and testing of the evidence followed acceptable procedures, challenges to evidence on such grounds as the use of probability calculations relate only to the weight the evidence should receive. Of course, any new or unorthodox testing procedures, or radical departures from customary practice, may offer an opportunity to challenge admissibility.

The 1994 B.C. Supreme Court case of *R. v. Richards*⁵² was the first in which the results of DNA tests obtained by the PCR method were admitted without the consent of the defendant. Two small droplets of blood had been found in the accused's car, but the samples were insufficient for an RFLP test at an

⁴⁹ (1992), 69 C.C.C. (3d) 395 (Ont. Ct. Gen. Div.).

⁵⁰ *Ibid.* at 28.

⁵¹ [1993] 4 W.W.R. 74 (N.W.T. S.C.).

⁵² *R. v. Richards* (27 May 1994), Cranbrook 4515 (B.C. S.C.).

RCMP laboratory. The evidence was sent to a private forensic lab in Seattle, where a PCR test found that the evidence sample was consistent with the victim's DNA profile. The Court decided in a *voir dire* that the evidence was both reliable and trustworthy, and that the prejudicial effect did not outweigh the probative value. The expert had followed required protocols, completed recommended control tests, and observed necessary quality control standards.

D. Population Databases

In *Baptiste*, the accused was a member of a First Nation from the interior of British Columbia, for which no population database existed. The expert for the defence opined that the effect of ethnic substructuring within racial groupings could erode the underlying assumptions of DNA typing. In the opinion of this expert, reliable results could not be generated in this case through the use of databases from aboriginal communities in coastal B.C., northwestern Ontario, or Arkansas. Consequently, the prosecution agreed to limit expert testimony about the significance of the match to qualitative terms.

Lafferty, also dealt with the issue of DNA databases. The accused belonged to the Dogrib First Nation. The question was whether the lack of a Dogrib database made the evidence unreliable. The Court accepted that even when variations exist among subgroups, the estimated frequencies are generally similar. The expert presented probability evidence based on databases from other Aboriginal populations. The Court added that the lack of an appropriate database could affect admissibility in certain situations, for example if the racial group was a distinctively different one in significantly isolated areas. Absent a database from a reasonably similar group, fundamental assumptions essential to reliability could be undermined. The Court also found that DNA frequency calculations are an "exercise in basic mathematics," and that an expert does not need to be a statistician or geneticist in order to be qualified to testify.

Currently, when a RCMP laboratory finds a match between samples, they will initially do calculations based on the Canadian Caucasian database, which draws from the largest, most representative contributing population. If requested by the Crown or the defence, the laboratory will also compute frequencies for other selected population groups.⁵³ It will then be up to the trier of fact to decide which is the pertinent database, based on the expert testimony.

It is important to note that there should normally be some evidentiary foundation before such a request is made. It is, at best, illogical and, at worst, discriminatory to assume that when a defendant belongs to a particular racial group, the profile frequency for that group should automatically be at issue. This presumes that the perpetrator is a member of the racial group. Instead, the ref-

⁵³ Interview with forensic scientist Todd Christianson, RCMP Forensic Laboratory, Winnipeg (19 October 1997).

erence database should be the one which, on the evidence, is likely to comprise the predominant racial background of the population of individuals who could have committed the crime.⁵⁴

The situation is different when, for example, eyewitness accounts have established the race of the offender, or if the crime was committed in a location, such as on a First Nations reserve, that indicates that the perpetrator might belong to a particular group. Database issues related to race and ethnicity, and other details of the case that affect the significance of frequency estimates, will moderate the weight that is attached to the evidence.

E. DNA as Novel Science

Clarification of the appropriate test for the admissibility of novel scientific evidence came from the Supreme Court of Canada's 1994 decision, *R. v. Mohan*.⁵⁵ The Court held that expert opinion that advances a novel scientific theory must be subjected to special scrutiny of both relevance and necessity, and that the theory must be shown to meet a basic threshold of reliability. The opinion must also be essential, in the sense that the trier of fact will be unable to come to a satisfactory conclusion without the expert's assistance. As the evidence approaches an opinion on the ultimate issue in the case, the application of this principle will become stricter. Techniques of psychological profiling were at issue in *Mohan*, rather than hard scientific data, such as population databases. Moreover, by 1994 the established methods of DNA profiling were no longer considered novel.

Severe degradation prevented the RCMP from applying a meaningful RFLP analysis test on a semen sample in the 1996 case of *R. v. Lyons*.⁵⁶ Using the protocols developed in the Guy Paul Morin case to overcome certain testing inhibitors, a private forensic laboratory in Boston found a six-probe match that would occur in the Caucasian population approximately once in 1 305 times.⁵⁷ The defendant argued that this was an unproven method and should be treated as novel scientific theory.

The Court accepted the results of the new method after considering the factors of relevancy, reliability, helpfulness, and the qualifications of the expert. At trial, the jury found the accused guilty of first degree murder of eight-year-old Jacqueline Clark, who had disappeared after accepting a ride on Lyons' four-

⁵⁴ G. Chayko & E. Gulliver eds., *Forensic Evidence in Canada*, (Aurora: Canada Law Book Inc., 1991) at 343.

⁵⁵ [1994] 2 S.C.R. 9 [hereinafter *Mohan*].

⁵⁶ (1996), 173 N.B.R. (2d) 321 (Q.B.).

⁵⁷ This relatively high frequency reveals the lower power of discrimination currently offered by PCR methods.

wheel all terrain vehicle.⁵⁸ This conviction was affirmed by the New Brunswick Court of Appeal in 1997.⁵⁹

A comprehensive review of the law pertaining to DNA evidence was undertaken in the 1996 murder case of *R. v. Beamish*.⁶⁰ The Prince Edward Island Supreme Court, Trial Division, declared that the theories supporting DNA typing had ceased to be novel. The Court also confirmed the general rule, articulated in *Lafferty*, that a *voir dire* on the admissibility of DNA evidence will not normally be necessary. The Court should be given a general outline of the expert's qualifications and the relevance of the testimony, on which it can rule in the presence of the jury. The remaining issues will only affect the weight assigned to the evidence.

However, the Court held that when specific aspects of the methodology or protocols are in issue an accused's motion for a *voir dire* should be granted to avoid what could amount to a significant risk to a fair trial.

The Court in *Beamish* also addressed the subject of frequency estimates, holding that in general, once evidence regarding DNA comparisons has been admitted, the expert should be permitted to express his or her opinion in such a way as to best convey the full evidence to the trier of fact. According to the Court, qualitative adjectives are not normally sufficient to convey the strength of the evidence to the jury. Appropriate cautions should be submitted to the jury, and the Court in *Beamish* affirmed the model suggested by the British Columbia Supreme Court in *R. v. Singh*:

[I]t can be made sufficiently clear to the jury that: 1) the estimates are not intended to be precise; 2) they are the products of mathematical and scientific theory, not concrete facts; 3) they do not purport to define the likelihood of guilt; 4) they should only be used to form a notion of the rarity of the genetic profile of the accused; and 5) the DNA evidence must be considered along with all the other evidence in the case relating to the issue of identification.⁶¹

The Court of Appeal in *Terceira* also referred to the *Mohan* test for admitting novel scientific evidence in the context of the DNA *voir dire*. Finlayson J.A. drew a distinction between scrutiny of the scientific technique employed, which is within the purview of the trial judge, and assessment of the expert's application of that methodology. It is the jury that must decide whether the expert's conclusions are reasonable and assign weight to that opinion.⁶²

⁵⁸ *Supra* note 53 at 340.

⁵⁹ *R. v. Lyons* (1997), 191 N.B.R. (2d) 267 (C.A.).

⁶⁰ (1996), 144 Nfld. & P.E.I.R. 310 (P.E.I. T.D.) [hereinafter *Beamish*].

⁶¹ *R. v. Singh* (1996), 108 C.C.C. (3d) 244 (B.C. S.C.).

⁶² *Terceira*, *supra* note 40 at 27.

Although the most significant outcome of DNA testing is the finding of a match at five or more genetic markers, the frequency of this profile in a relevant population can also be of considerable evidentiary value. However, the effect of this number will depend on the individual juror, the numerical strength of the association, and, ultimately, the balance of the evidence.

V. DNA EVIDENCE, CONTAMINATION, AND LABORATORY ERROR

ONE AREA OF CONCERN with DNA test results is the potential effect of contamination on evidentiary samples. The inadvertent transfer of a portion of one sample to another, perhaps by the gloved hand of an analyst, a testing instrument, or an accidental spill or spray when the samples are in close proximity, could result in an incorrect declaration of a "match." This is particularly so where the sensitive techniques of PCR testing are used.⁶³

The same danger arises when a sample taken from a crime scene contains materials from more than one individual. This sample will thus carry more than one DNA type. The most obvious example is the scene of a violent crime, where there may be mixtures of blood from the victim and the assailant. A mistake in the labelling of samples at the crime scene or in the laboratory, or the inadvertent switching of DNA samples could lead to a sample from a suspect, victim, or crime scene being compared to itself.⁶⁴ This would not normally be detected by an analyst, and would result in an apparent match and a false inclusion. In cases of heterosexual sexual assault, however, an error of this nature would likely be detected through the use of sex-typing probes.

Laboratory errors, singularly or in combination, could conceivably lead to a false inclusion. Estimates of the error rate in forensic laboratories vary widely, from as high as four percent of samples tested to a low of .001 percent.⁶⁵ The error rate in a particular laboratory can be estimated by viewing its results on external and internal proficiency tests, which measure the ability of the analysts to produce correct results and to avoid false inclusions. Any indication that specific errors may have been made in a particular case, however, is far more significant than any historical or universal lab error rate.

For example, in the trial of O.J. Simpson there was convincing evidence that the procedures used in the collection and handling of the evidence samples were seriously deficient. Reference vials containing the blood of the victims had somehow become contaminated with the blood of the accused, a fact that the

⁶³ *Supra* note 5 at 103.

⁶⁴ *Supra* note 14 at 465.

⁶⁵ *Ibid.* at 464.

prosecution neglected to address.⁶⁶ This mishandling of evidence was used by the defence as a foundation to raise alternative explanations for the apparent DNA matches.

The issue of contamination and laboratory error was thoroughly canvassed by Alberta Court of Queen's Bench in *R. v. Love (No.2)*.⁶⁷ In that case, an expert witness for the prosecution testified that lab error rate is possible and relevant, and that "false positives" have been reported in the past. However, the expert also stated that in assessing the risk of error, various factors must be examined, including the particular analysts, procedures and controls, the "chain of continuity", autorads, and the analyst's notes. After conducting such a review on the test results in the *Love (No.2)* case, the expert was of the opinion that there was no lab error, and that no "false positive" occurred.

A second expert witness for the prosecution testified that it was neither appropriate, nor realistic, to affix an industry-wide error rate to all forensic laboratories. According to this expert, any discussion of error rates must take place in the context of a specific lab, examiner, and case.

The expert witness for the defence in *Love (No.2)* offered the opinion that an estimated industry-wide error rate of between one and four percent did, in fact, exist in the testing procedures of DNA laboratories. This opinion was based upon documents dealing with error rates and proficiency testing in the United States. The expert opined that "a scientist should not say—that a person is virtually certain to be the source of a sample," for that opinion ignores lab error.

The Court questioned the foundation for the defence expert's estimate of industry-wide error. The decision of the Court expressed doubt about whether estimates of error based on proficiency testing in private U.S. labs could be applied to the Canadian Forensic Laboratory in Ottawa, particularly where the defence expert was unaware of the protocols or testing techniques employed in the various laboratories.

Consequently, Cairns J. held that the defence expert's evidence was "only marginally relevant," and stated in summary,

In the final analysis, while in the next DNA typing case done by the [lab], there may be an error, I have abundant opinion evidence in this case, supported by reasons, that there was in this specific case no lab error in fact . . . I accordingly afford [the defence expert's] evidence very little weight.⁶⁸

⁶⁶ W. Thompson, "DNA Evidence in the O.J. Simpson Trial" (1996) 67 *Univ. Col. L. Rev.* 827 at 833.

⁶⁷ *R. v. Love No. 2* (15 June 1994), Calgary 9301-0694-C1 (Alta. Q.B.) [hereinafter *Love (No. 2)*].

⁶⁸ *Ibid.* at 112.

VI. DNA EVIDENCE AND THE CHARTER

ACCEPTING THAT DNA EVIDENCE should be *prima facie* admissible, exceptions must be addressed in the context of the *Charter*. Under s. 24(2), evidence may be excluded if it is obtained in a matter that contravenes a *Charter* right and if its admission would bring the administration of justice into disrepute. Before the enactment of legislation on 13 July 1995, there were no lawful means by which the police could acquire a suspect's DNA sample for testing, unless the suspect consented to provide a sample. Attempts to use a general warrant to seize biological samples were often thwarted by s. 487.01(2) of the *Criminal Code* and its prohibition against interference with a person's bodily integrity.

The legislative void led police to concoct some interesting schemes to obtain samples, such as the undercover ruse used in *Love*. DNA material has also been obtained without consent from items which have been "abandoned" by an accused, including cigarette butts, eating utensils, tissues, chewing gum, and material from a dentist's office after an accused's examination.

Appellate courts, nevertheless, frequently admitted DNA evidence obtained in a manner that clearly breached *Charter* rights. In cases such as *Baptiste*, *Légère*, and *R. v. Stillman*,⁶⁹ the courts determined on a balance of factors that admission of the evidence would not bring the administration of justice into disrepute. Those factors, articulated in *R. v. Collins*,⁷⁰ include the seriousness of the breach, the gravity of the charge, the conduct of the police, and the availability of other investigatory techniques.

In *Love*, the Alberta Court of Appeal admitted into evidence the results of DNA testing on the mucous sample from discarded tissue, despite finding that the police had violated the accused's rights under s. 8 of the *Charter*.⁷¹ However, the Court held that evidence of a match between blood in the taxicab and hair samples that the undercover police officers had obtained at a bush party should have been excluded. The accused had not consented to allow an agent of the state to remove his hair, and this constituted an unreasonable search and seizure.

In analysing the hair evidence according to the principles articulated in *Collins*, the Court of Appeal in *Love* held that there was a reasonable probability that police would have lawfully obtained some testable material from the suspect in due time. Hence, the fairness of the trial was not significantly impaired. However, the trickery, deceit, and bad faith employed by the police made this a serious and unnecessary *Charter* breach. Furthermore, the evidence was unrec-

⁶⁹ [1997], 1 S.C.R. 607 [hereinafter *Stillman*].

⁷⁰ [1987] 1 S.C.R. 265 [hereinafter *Collins*].

⁷¹ S. 8 states that, "Everyone has the right to be secure against unreasonable search or seizure."

essary in light of the tissue sample. The Court concluded that the DNA results from the hair samples should have been excluded under s. 24(2) of the *Charter*. The tissue sample was sufficient to support a conviction, however, and in dismissing the appeal, the Court held that,

[T]he facts leading to the seizure of the discarded tissue [would not] generate revulsion amongst right-thinking Canadians. The police in time would have lawfully obtained some form of [material] suitable for testing... . In all of the particular circumstances, excluding the evidence would bring the administration of justice into disrepute.⁷²

The Supreme Court decision in *Stillman* was released in 1997. According to the facts of the case, a youth had been arrested in 1991 for the murder of a 14 year old girl. The RCMP had, under threat of force and without the consent of the suspect, obtained scalp and pubic hair samples for DNA testing, as well as plasticine teeth impressions. The accused was released, but arrested again several months later, at which time more hair samples, saliva samples, a buccal swab, and more teeth impressions were taken. While using the restroom after his first arrest, the accused blew his nose into a tissue, which was recovered by police and tested for DNA type.

At trial, all of the DNA evidence was admitted and the accused was convicted by a jury of first degree murder. His appeal to the New Brunswick Court of Appeal was dismissed. However, the majority of the Supreme Court of Canada held that the common law did not grant police the power to take bodily samples without consent, and that the accused's right to security of the person, and his right to be free from unreasonable search and seizure, were very seriously violated. The police conduct was characterised as abusive and reprehensible.

Cory J., writing for the majority, undertook to clarify the *Collins* factors to be considered when conducting an analysis under s. 24(2). There are three groups of factors must be considered in the context of their effect on the repute of the administration of justice. First, the court must contemplate factors relating to the fairness of the trial. If it is determined that admission of the evidence would render a trial unfair, then the evidence must be excluded without consideration of the other *Collins* factors. The fairness of the trial depends, to a great degree, on the nature of the evidence. Conscriptive evidence compels an accused to incriminate himself or herself. If the evidence is conscriptive, and if it would not have been discovered absent the *Charter* breach, its admission would render the trial unfair. The court found that all of the DNA samples in this case, apart from the tissue, were conscriptive evidence taken without consent and would not have been discovered in any other way. Accordingly, the evidence was excluded.

⁷² Love, *supra* note 3 at 51.

If the accused is not compelled to participate in the creation or discovery of the evidence, then it is *non-conscriptive* evidence, which will rarely operate to render a trial unfair. The court should then move on to consider the second and third factors: the seriousness of the *Charter* violation, and the possibility that the administration of justice could be brought into further disrepute by excluding the evidence rather than by admitting it.

With regard to the mucous sample, the Supreme Court held that this was not conscriptive evidence, as the accused had not been compelled to produce it. The tissue could have been lawfully seized from the garbage by the police after it was discarded by the accused, no force was used by the police, and the tissue's admission would not bring the administration of justice into disrepute. In the result, the Court ordered a new trial, holding that only the results of the mucous sample would be admissible.

Love and *Stillman* concerned *Charter* violations of a very different character. While police deception was the device in *Love*, *Stillman* involved a situation of outright intimidation and force to obtain evidence. The harshness of that force, however, depends on one's perspective. The police suspected the youth of committing a terrible crime that they wanted solved, but they had no lawful means by which to obtain a sample. It is interesting to note the positions of Madam Justice L'Heureux-Dubé and Mr. Justice Gonthier, who found that the actions of the police did not constitute an infringement of the accused's *Charter* rights.

Exclusion of the DNA evidence was not fatal to the prosecution's case in *Love* or *Stillman*, as there was another admissible sample. If these had been the only samples, the effect of exclusion on the repute of the administration of justice would certainly be immense. This would be especially so for a serious offence, such as sexual assault or murder. The DNA legislation grants the authorities the means to obtain a suspect's samples, provided they can show reasonable grounds. Even where no such grounds exist, however, investigators are unlikely to refrain from attempting to acquire testable materials. According to *Stillman*, these samples should be excluded unless they meet the test of discoverability, which suggests that we have not seen the last of the Kleenex in the courtroom.

VI. DNA WARRANTS, LEGISLATION, AND THE COURTS

THE NECESSITY OF PARLIAMENTARY ACTION in the area of DNA sample collection was manifest in the 1994 Supreme Court of Canada decision, *R. v. Borden*.⁷³ In that case, the Court ruled that a blood sample of the accused had been improperly obtained, and the resultant DNA evidence should be excluded from

⁷³ *R. v. Borden*, [1994] 3 S.C.R. 145.

trial. The accused had voluntarily provided a blood sample for DNA typing in relation to a specific charge of sexual assault, but the police had failed to inform him that they intended to use the sample in the investigation of a previous sexual assault on an elderly woman. Since the blood sample had been obtained from the accused without his valid and informed consent, it was held to be inadmissible, and the accused was acquitted of the prior offence.

The following year, Bill C-104 was passed. The legislation was proclaimed into force on 13 July 1995, and now forms ss. 487.04 to 487.09 of the *Criminal Code*. Under the new law, a provincial court judge may issue a warrant that authorises a peace officer to seize a bodily substance from a person for the purpose of DNA analysis. Police officers are then able to pluck individual hairs, take a mouth swab, or collect blood droplets from a suspect without that person's consent, provided that the sample is collected in a manner that respects both the dignity and privacy of the person, and that the force used is reasonable.⁷⁴ It is also open to the judge to include terms and conditions in the warrant to ensure that the seizure is reasonable under the circumstances.

To obtain a DNA warrant, a police officer must have reasonable and probable grounds to believe first, that the person against whom the warrant is to be executed was a party to one of numerous designated offences, which include sexual offences and other serious offences against the person and property; and second that a DNA sample is required from the suspect for comparison with a bodily substance found at the crime scene, or on the body or clothes of a victim. In addition, the court must be satisfied that it is in the best interests of the administration of justice to issue the warrant.

Additional procedural rights are granted to "young persons" who are the subject of DNA warrants,⁷⁵ and the legislation also provides for the destruction of bodily substances and the results of DNA analysis where testing excludes the individual as a suspect, or where he or she is acquitted of the offence.⁷⁶

In *obiter*, Mr. Justice Cory of the Supreme Court of Canada made reference to the constitutionality of the new legislation for seizing DNA samples in the 1997 appeal of *Stillman*:

Although the issue was not raised it would seem that the recent provisions of the [Criminal] Code permitting DNA testing might well meet all constitutional requirements. The procedure is judicially supervised, it must be based upon reasonable and

⁷⁴ J. Allain, *Forensic DNA Testing: Legal Background to Bill C-104*. (Ottawa: Minister of Supply & Services Canada, 1995) at 7.

⁷⁵ *Criminal Code*, R.S.C. 1985, c. 46, s. 487.07(4).

⁷⁶ *Ibid.* at s. 487.09.

probable grounds and the authorizing judge must be satisfied that it is minimally intrusive.⁷⁷

Mr. Justice Hill, of the Ontario Court, General Division, released a thorough decision on that very issue a few months later in *R. v. S.F.*⁷⁸ The accused had applied to have the sections of the *Criminal Code* dealing with DNA testing declared inconsistent with s. 7 and s. 8 of the *Charter*. The Court held that s. 487.06(1)(a) of the *Criminal Code*, the provision dealing with hair seizures, infringed upon s. 8, and could not be upheld under s. 1.

Expert testimony established that for a hair sample to provide the analyst with the DNA necessary for current identification procedures, it must contain nucleated cells.⁷⁹ Hair samples will only yield reliable results if the root sheath is retrieved.

Although the Court held that taking hairs for DNA testing involves minimal discomfort to an accused, it also noted that the *Criminal Code* did not restrict the locations of the body from which hair may be lawfully extracted. It was held that a seizure of pubic hair, for example, "implicates greater intrusion on privacy interests and individual dignity."

The Court also accepted evidence that between five and ten percent of the population will not supply a root sheath when a hair is pulled from the scalp. In these cases, a suspect will have to be detained once more and required to submit another type of sample.

Consequently, the Court found the provision to be an infringement on an individual's right to be secure against unreasonable seizure. The provision was not a proportional response to achieving the legitimate objectives of Parliament and was not, therefore, rescued by s. 1 of the *Charter*. Accordingly, the provision was declared to be of no force or effect.

Excepting this provision, the Court upheld the DNA warrant legislation as a rational and proportionate response, designed to meet the important government justifications of crime control, law enforcement, and the search for truth in the criminal trial process.

Mr. Justice Hill also left open the possibility that, although s. 487.05(1) of the *Criminal Code* creates a presumption that DNA warrant applications will be heard *ex parte*, the Court may in rare circumstances order that a hearing on notice be conducted.

⁷⁷ *Stillman*, *supra* note 69 at 99.

⁷⁸ (1997), 153 D.L.R. (4d) 315 (Ont. Ct. Gen. Div.).

⁷⁹ See, however, *State v. Ware*, *supra* note 7, where DNA test results on the mitochondrion of a cell were utilised to secure a murder conviction.

Legislation has recently been passed by Parliament that would allow for the formation of a national "DNA databank."⁸⁰ Individuals who are convicted or discharged of certain designated *primary* offences, including murder and sexual offences, would be compelled to provide a DNA sample. The resulting genetic profiles would be stored in a convicted offenders index, even if appeals are pending. The only way for a *primary* offender to avoid an order demanding a DNA sample would be to satisfy the Court that "were the order made, the impact on the [offender's] privacy and security of the person would be grossly disproportionate to the public interest in the protection of society and the proper administration of justice."

Those found guilty of less serious *secondary* offences, including assault and robbery, will only be required to submit a sample if the Court is satisfied that such an order would be in the "best interests of the administration of justice."⁸¹ Significantly, Bill C-3 also provides that the legislation should be applied to include DNA samples of individuals who are convicted or discharged of a "designated offence" after the coming into force of the new provisions, even where the offence had been committed before the law was enacted.

In addition, the law will apply retroactively to include in the databank any repeat sexual offender serving a sentence of two years or more, any individual who has been convicted of more than one murder committed on separate occasions, and anyone who has been declared a "dangerous offender" under the *Criminal Code*.⁸² It remains to be seen how these provisions will fare when held up to *Charter* scrutiny.

A crime scene index containing DNA profiles from unsolved crimes would complement the DNA crime bank and would resemble the Automated Fingerprint Identification System (AFIS) of the RCMP in its operation.⁸³ The AFIS aids in criminal identification by allowing investigators to conduct comparisons of fingerprints found at crime scenes with a national repository of fingerprint impressions.

Canada's DNA databank would parallel the FBI Combined DNA Index System (CODIS), established in 1994. By 1997, over 60 forensic laboratories in

⁸⁰ Bill C-3, *An Act respecting DNA identification and to make consequential amendments to the Criminal Code and other Acts*, 1st Sess., 36th Parl., 1998 (assented to 10 December 1998, S.C. 1998, c. 37)

⁸¹ C. Schmitz, "\$12 Million, 18 Months to Launch DNA Data Bank" *The Lawyers Weekly*, 17:42 (20 March 1998).

⁸² M. Zigayer, "The Canadian DNA Data Bank" in P. Patenaude, ed., *Police, techniques modernes d'enquête ou de surveillance et droit de la preuve : actes du Colloque* (Sherbrooke: Éditions Revue de droit de l'Université de Sherbrooke, 1998). Note that "discharged" refers to a judicial discharge under s. 730 of the *Criminal Code*.

⁸³ "Data Bank for DNA Revived in Bill" *The Globe & Mail* (26 September 1997) A3.

the United States were participating in CODIS, and over 200 "cold hits" had been recorded, linking suspect samples to crime scene samples through random searches of the database.⁸⁴

VII. CONCLUSION

DNA PROFILING TECHNIQUES HAVE now been in use in criminal cases for over a decade. New and more advanced techniques are being developed, and complete automation may someday displace the forensic analyst. What remains certain, however, is that people will continue to commit violent crimes. Some will be careful and fortunate, and will not permit their biological materials to implicate them. Others will be deservedly betrayed by their base pairs.

The value of DNA evidence as a system of criminal identification, and as a contributor to the search for truth and justice, cannot be articulated without a degree of understatement. Just ask David Milgaard, Guy Paul Morin, or numerous inmates worldwide, many of whom may be innocent, who are currently waiting for DNA testing to deliver their freedom.

Counsel should remain vigorous in their challenges to DNA test results. Although estimates of the rate of error in forensic laboratories vary widely, the potential for error is always present. The merits and value of DNA evidence do not by any means suggest that an innocent person will never be sent to prison due to a mistake by an enzyme, a computer, or another human being.

⁸⁴ See *e.g.*, online: FBI Homepage at <<http://www.fbi.gov/lab/report/research.html>> (date accessed: 25 September 1997).