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CR 01688

IN THE SUPREME COURT OF THE NORTHWEST TERRITORIES

BETWEEN:

HER MAJESTY THE QUEEN

- and -

ROY LAFFERTY

Ruling as to the admissibility of "DNA typing" evidence.

Heard at Rae-Edzo on February 22 & 23, 1993

Judgment filed: March 2, 1993

REASONS FOR JUDGMENT OF THE HONOURABLE MR. JUSTICE JOHN Z. VERTES

Counsel for the Crown: Dennis Claxton

Counsel for the Accused: Thomas Boyd

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REASONS FOR JUDGMENT

The Crown seeks a ruling as to the admissibility at trial of certain scientific evidence which has come to be known as "DNA typing" or "DNA profiling".

A *voir dire* was held at the commencement of the trial. I heard the evidence that the Crown seeks to introduce. This is a non-jury trial, but that makes no difference to the legal analysis that I must use to make a decision.

Because the *voir dire* was held in the context of a trial, and the trial was being held in a small community outside of Yellowknife, I did not want to delay matters to prepare extensive reasons. I ruled at the time that the evidence was admissible and indicated that my reasons for doing so would follow. These are those reasons.

It is instructive to keep in mind how recent DNA typing evidence is for forensic

uses. It was first used in England in only 1986, in the United States in 1987, and in Canada in 1988. To my knowledge, this is the first time a court in the Northwest Territories has been called on to consider its admissibility.

4 In addition to the helpful submissions of counsel, I have had the benefit of reviewing a number of recent articles on the topic as well as most of the Canadian cases that have already considered this issue. For sake of convenience I have listed those articles and cases in the Appendix to these reasons.

5 The scientific basis for the development of DNA typing is found in molecular biology. DNA (deoxyribonucleic acid) is an organic substance which comprises the chromosomes found within the nucleus of living cells. It provides the genetic code which determines a person's individual characteristics. Every person, with the exception of identical twins, is unique in his or her genetic composition. And every cell contains DNA. All DNA in the body, whether from blood, bone, skin or whatever, is the same at all times in a person's life. It is "unique but unchanging": see Alldridge at page 689.

6 The methodology of DNA typing is obviously beyond my expertise and all I will attempt to do is summarize it. It is a collection of procedures used to extract the DNA from the cells in which it is found, slicing it up in various lengths, separating the resultant fragments by length, and finally identifying the resulting fragments by the use of radioactive "probes" which recognize specific sequences of atom pairings. The process analyzes specific parts of the entire DNA strand which are selected for their variability,

what are termed "independent polymorphic loci".

The aim of the process is to match an unknown specimen with a known sample. But the typing by itself is meaningless in a forensic sense.

In forensic work a DNA specimen is usually taken from some substance found on the person of the alleged victim or at the crime scene. A known sample is also taken from the suspect. If the profile of the DNA in the specimen is the same as that in the suspect's sample, if there is a "match", that in itself is not proof of the positive identification of the suspect as the person who committed the crime. It means only that the profile of the DNA in the specimen is consistent with the profile of the suspect's DNA.

There are two reasons why two genetic profiles would be consistent. One is that they do in fact come from the same person; the other is that the match is a mere coincidence. For that reason there is a second step in the DNA typing process. Once the particular match is obtained, the investigator goes on to estimate a probability in terms of the statistical odds of finding a matching pattern in a certain population base. This is a matter of population genetics and statistics theory: see **Johnston** at page 401.

As can be readily seen, DNA typing is in many ways simply another method, albeit a new one, of providing evidence of identification for use in criminal cases. In this sense it is no different than other scientific methods of identification, most of which have

been accepted by the courts for many years. These scientific methods include the analysis of bodily fluids such as blood, semen and saliva, hair analysis, bite marks, and fingerprints. I note that blood testing generally uses a determination of genetic markers which are measured against population studies of frequency distribution of combinations of such markers. As was stated in evidence before me, the scientific steps used in DNA typing have been used for many years in microbiology, genetic research and medical studies. It is novel only in its application to forensic work.

11 In this case the accused is on trial on three charges: a sexual assault on complainant L.M.F.; a sexual assault on the same date on complainant J.F.; and a charge of break and enter with intent to commit the offence of sexual assault. This is a non-jury trial, so there is at least the advantage of not having to repeat the evidence on the *voir dire* in the trial proper should I rule it to be admissible.

12 The evidence was presented through the testimony of Mr. Gary Verret, a laboratory specialist in biology with the R.C.M.P. forensic laboratory in Ottawa. He holds a masters of science degree in biochemistry and has received specialized training in molecular genetics and DNA typing in-house with the R.C.M.P. and at the F.B.I. forensic science research and training centre in Virginia. He has worked on approximately 50 cases where DNA typing analyses were carried out and has testified on DNA typing in the provincial courts of British Columbia and Manitoba. Based on his training and experience, I qualified him to give expert evidence on the identification of bodily fluids and the forensic aspects of DNA typing.

Mr. Verret gave an outline of the science regarding DNA generally and the methodology of DNA typing. He then gave evidence about the specific testing procedure employed in the R.C.M.P. laboratory.

The practice is to conduct five probes on five highly variable specific loci on the DNA fragments. The protocol is if there is an exclusion, that is to say there is no match, on the first probe then, as Mr. Verret put it, the "case is over". It is only if there is a match on the first probe that they go on to the next one. This is then the protocol with each succeeding probe. It was described by Mr. Verret as a "process of exclusion".

With each probe there is produced an autoradiogram which is then checked for a visual match. If there is a visual match, then there is a computer verification. Only if there is both a visual match and corresponding computer verification is any statistical significance applied to the probe. If there is no computer verification of the visual match, then the result of that probe is labelled "inconclusive" and there is no statistical significance attached to it.

Mr. Verret acknowledged that there is a certain imprecision in running the tests. This can be explained by a number of technical factors. For that reason there is a "tolerance" level of plus or minus 2.6% applied to the visual match if the computer test shows a variation from the visual one. If it falls outside of that tolerance, then the result is labelled "inconclusive".

17 There is also a concern about degradation or contamination of the samples. This appears to be a special concern when extracting DNA from sperm cells since sperm appears to be particularly resistant to extraction. For that reason more stringent extraction techniques have to be applied to sperm cells. However, according to Mr. Verret, the extraction techniques used are devised to minimize degradation. In any event, even if the sample is degraded, that will not cause a false "positive" result since the probe will be unable to bind to it. Similarly, any contamination of the sample will only result in a non-match or, at most, an inconclusive result. In practice, contamination will result in either degradation of the DNA material or an inability to extract it. In either case there would be an inconclusive result.

18 There are also certain controls or "quality assurance" aspects to the tests. With each autoradiogram test there is an "internal standard" applied by using a known independent blood stain. In addition, after the five probes are done on the polymorphic loci, there are two control probes, one to a monomorphic locus and one to the sex chromosome specific locus. If there is a defect in the test procedure, according to Mr. Verret, this would be revealed by these control probes.

19 After there is a matched profile, the laboratory investigators conduct a statistical analysis to estimate the probability factor as to how often one would encounter this given profile in a given population base. In order to calculate this one starts from a data base which gives the random frequency ratio for that population group of the particular profile at each locus subject to the probe. Then there is the application of a

genetic science formula called the "Hardy-Weinberg equilibrium" which is beyond my ability to explain in any language, simple or otherwise. Then, by use of a standard mathematical step called the "product rule", each probe pattern with a match is multiplied together to give the overall profile frequency. The basis for this application is described as a rudimentary principle of probability theory: that the frequency of occurrence of independently occurring events may be multiplied by one another to determine the frequency of occurrence of the aggregate of those events. Obviously, the greater number of matched probes there are, the greater the probability that they come from the same source since the frequency of occurrence would be that much less: see Walsh at pages 474-475.

With respect to estimating frequency probabilities, Mr. Verret acknowledged that he was not either a population geneticist or a statistician. However, he pointed out that the exercise of calculating frequencies is largely mathematical applying known principles. In addition, study of the "Hardy-Weinberg equilibrium" was part of his studies in biochemistry while the "product rule" is a long-established principle applied in statistical studies.

There is a further quality assurance practice employed in the R.C.M.P. laboratory. All test results and conclusions are reviewed by a second analyst.

Turning to the specific testing in this case, Mr. Verret testified as to the testing being done in conformity with the protocol established by the R.C.M.P. The samples

tested were a vaginal swab from complainant L.M.F. which was found to contain semen, a known blood sample from L.M.F., and a known blood sample taken from the accused (which sample was admitted as having been taken with the accused's consent freely given). Human DNA was extracted from each of these samples including from the semen found in the vaginal swab. Five probes on the variable polymorphic loci were run with the result that in all five probes there was a visual match between (a) the female DNA extracted from the vaginal swab and the DNA extracted from the complainant's blood sample; and (b) the male DNA extracted from the semen and the DNA extracted from the accused's blood sample. Of these five visual matches, four were verified by computer analysis.

23 The lack of computer verification of one of the probes was explained as being due to one band on the autoradiogram being outside of the computer's marker range. In any event, there is no adverse result from this since that probe was, in accordance with R.C.M.P. protocol, designated as inconclusive and no statistical significance was applied to it.

24 After running the five probes, the two control probes were run with results that generated confidence that the tests ran properly and there was no "false" inclusion. In addition, in this particular case, Mr. Verret ran two additional probes which matched visually and were verified by computer analysis. However, because there was no data base on control DNA for these probes, Mr. Verret did not apply any statistical significance to them.

The calculation of frequency probability was done on the basis of the four matched probes. Mr. Verret testified, however, that to his knowledge it is extremely rare to find a four or five probe match at random. There are apparently no reports in the scientific literature of any four probe matches among unrelated individuals.

Mr. Verret gave the opinion that the possibility of the DNA from the semen in the vaginal swab originating from someone other than the accused is "remote". He further calculated that the DNA typing formula from the four matched probes has an estimated frequency of occurrence of between 1 in 5200 and 1 in 7900. This variation is based on his calculation of frequency based on the data bases compiled by the R.C.M.P. for three native Indian populations:

(i) less than 1 in 5200 in the British Columbia Salishan population;

(ii) less than 1 in 6300 in the northern Ontario native population; and,

(iii) less than 1 in 7900 in the Saskatchewan native population.

He further testified that if one were calculating frequency for the Canadian caucasian population, the frequency of occurrence would be 1 in 420,000.

It should be noted that the data bases referred to were compiled at random, and anonymously from hospital and other medical records. The data bases for the native Indian groups referred to contained between 110 and 230 samples which, according to Mr. Verret's evidence, are enough samples to instil confidence in population geneticists and statisticians.

28 One should always tread carefully when discussing racial differences. However, it is scientifically established that there are variations in genetic profiles between racial groups. There are also genetic variations within racial groups although these are far less than between different groups. Studies have been made of various groups and sub-groups in different parts of the world. Generally, there is acceptance of the finding that even within small isolated sub-groups of a certain race there is still a significantly low probability factor for a match among unrelated individuals. There is also general acceptance that while there may be variations among sub-groups in a particular race, there are also general similarities in the frequency occurrence ratios.

29 What factors would explain the difference between the frequency ratios for the Canadian native population as opposed to the Canadian caucasian population? Mr. Verret identified some factors as geographical isolation, so that there is a smaller gene pool mixing, and lack of outside mixing until relatively recently in history. Therefore one would expect greater frequencies. However, the frequency ratios do not depend on the number of people in a group.

30 It is acknowledged that the accused is a Canadian native belonging to the Dogrib First Nation. His racial sub-group comprises approximately 2500 people. He lives in a community of approximately 1700 people. When asked to estimate the frequency ratio based on these factors, Mr. Verret could not venture an opinion. He did say though that studies have shown that there is not much difference within racial groups and that, statistically, the numbers for the three native populations noted were "fairly similar" and

he would expect a ratio based on a specific Dogrib data base to also be generally similar.

In this case the defence takes no issue with the continuity of the exhibits, so there is no question as to the identification of the source of the samples tested. Further, there is no issue concerning the methods used to obtain the samples.

Crown counsel submits that the DNA evidence is relevant and probative of the charge of sexual assault involving the complainant L.M.F. He further submits that, having regard to the general acceptance of the scientific principles involved, the law should be at a point now where one can take judicial notice of the expertise and thus not need to automatically question admissibility. Any concerns over the development or refinement of the scientific technique should go to weight and not admissibility (as held in **Terceira**).

Defence counsel submits, essentially, that this technique is so new, and so potentially powerful in the arsenal of the prosecution, that there is a danger in rushing to embrace this procedure. There is the danger of overwhelming the jury, or any trier of the facts, with the statistical probabilities so that there may be a focus on that opinion to the exclusion of all other evidence. Further in this case, because of the lack of a Dogrib or Mackenzie Valley Dene data base, this evidence is unreliable and should not be accepted.

Defence counsel also argues that the reliability of any novel scientific technique should be proven beyond a reasonable doubt. This is taken from an American commentator but, in my view, it does not accord with Canadian law. In my opinion, the

law in Canada favours an expansive admissibility standard by emphasizing relevance so long as there is a base in expert evidence: see Lussier at pages 335 to 338.

35 To say that a scientific technique must be proven beyond a reasonable doubt is not the same thing as saying it must be generally accepted in the scientific community. There will always be a certain room for disagreement in scientific principles and methods. Only the most basic scientific facts can be said to be proven beyond a reasonable doubt. I do not think there is any support for the proposition that admissibility of expert evidence, which is of course a question of law, should be put to the reasonable doubt standard.

36 I will now discuss the issues raised by these submissions.

37 The first question that could be asked is whether it is even necessary to hold a *voir dire* in this case. After all, as noted earlier, DNA evidence is in essence no different, in its forensic application, than other types of scientific identification evidence. It depends on expert evidence since it is knowledge beyond the everyday experience of non-professionals in the field. Why should it not, as with other expert evidence, be left to the trier of fact to be accepted or rejected in whole or in part? It appears that the only reason why earlier cases have assessed the admissibility of DNA evidence at a *voir dire* is because it is new and complex.

38 Beside resulting in lengthy and, as I will argue, unnecessary *voir dires*, the focus on the novelty and complexity of DNA evidence has also led many courts into a

needless diversion of legal theory. Many of the cases in Canada, as well as the academic articles, expend a lot of effort discussing the test for the acceptance of novel scientific evidence.

In Canada, unlike the United States, there is no definitive test for the admissibility of novel scientific evidence. Instead, scientific evidence is put to the same test as other expert evidence, that being indicia of relevancy and helpfulness. This was articulated by Kurisko J. in **R. v. Doe (No. 2)** (1986), 31 C.C.C. (3d) 353 (Ont. Dist. Ct.) at page 370:

> I have concluded that there is no special test or "threshold issue" requirement applicable to the determination of admissibility. The evidence need only meet the traditional requirements of relevancy and helpfulness.

This appears to express as well the situation in England: see Alldridge at page 692.

In the United States the test is one of "general acceptance" of the underlying principle and the technique by the scientific community: **Frye v. U.S.**, 293 F. 1013 (C.A.D.C., 1923). This test has been rejected in Canada: **R. v. Beland**, [1987] 2 S.C.R. 398.

In my opinion the submission of DNA evidence should be subject to the same test as other evidence. First, is it relevant? By that I mean does it relate to a fact in dispute. If relevant, then is it reliable? And if reliable is it helpful? In other words, does it help or hinder the trier of fact and does its probative value outweigh any potential

prejudice? If these factors are met, then the evidence should be put to the trier of fact unless there is some rule of law or policy reason for excluding it. As stated by McLachlin J. in **R. v. Seaboyer** (1991), 66 C.C.C. (3d) 321 (S.C.C.) at page 389:

> In general, nothing is to be received which is not logically probative of some matter requiring to be proved and everything which is probative should be received, unless its exclusion can be justified on some other ground.

42 In this case the DNA evidence is clearly relevant. If accepted by the trier of fact, it can be used as a piece of evidence tending to incriminate the accused or, even more so, tending to dispel any doubt about the accused's guilt. But is it reliable?

43 As noted previously, the techniques underlying DNA typing have been used for many years in other scientific endeavours. The general theories of genetics which support this evidence are unanimously accepted within the scientific community in the United States. It has received judicial acceptance: **U.S. v. Jakobetz**, 747 F. Supp. 250 (1990), affd. U.S.C.A. (1992). In addition, several states have passed legislation deeming DNA identification data to be admissible in their courts.

44 In Canada there has also been general judicial acceptance of DNA evidence. I am not aware of any case in Canada where DNA evidence was ruled inadmissible. The controversy, if any, in Canada has been over the use of probability statistics and this was addressed in only 2 of the 12 cases noted in the Appendix. And, in those 2 cases, **Bourguignon and Baptiste**, the dispute was whether the trier of fact should be told the

probability statistics or should just be told that the chance of a coincidental match is, in the expert's opinion, "remote".

45 In my opinion, the general acceptance of the scientific techniques involved make the testing evidence reliable. I am reinforced in this conclusion by the evidence I have heard about the testing procedures and control standards employed by the R.C.M.P. laboratory.

46 The testing procedures, in my opinion, are an indicia of reliability. If there are many testing facilities and there is no standardized testing procedure, or mandatory quality assurance methods, then the reliability of the evidence is brought into question. This, in my view, is the reason for the concern over the acceptability of DNA evidence raised by a 1992 report of the U.S. Academy of Sciences: see Lussier at page 326. In the United States there are numerous private testing facilities using different procedures. The evidence I heard is that the R.C.M.P. and other Canadian law enforcement agencies engaged in DNA typing are using standardized procedures.

47 But even if the testing procedure is reliable, is the evidence of statistical probability also reliable?

48 The first question is whether a biochemist, such as Mr. Verret, is qualified to give probability evidence. There is, as already noted, a cross-over into the fields of population genetics and statistics theory when he gives such evidence. As stated by

Langdon J. in **Johnston** (at page 402):

> As a matter of common prudence, no matter how reliable may be the expertise of a particular scientific discipline, one must exercise extreme caution in areas where different disciplines interface. It is unavoidable that in such areas experts in each area will trespass on the relatively unfamiliar territory of experts in others.
>
> The molecular biologist who tests the samples and proclaims the match may not be qualified to comment upon the frequency with which that particular DNA profile is likely to appear within a particular population. Even if the mathematics involved should be entirely reliable, it will be obvious that the accuracy of the mathematical result depends upon the validity of any assumptions which underlie the population genetics data.

49 Mr. Verret testified, however, that calculating the frequency probability is mainly an exercise in basic mathematics using a formula that was part of his studies (the "Hardy-Weinberg equilibrium") and a mathematical tool that has been applied for hundreds of years (the "product rule"). Crown counsel says that he is, as an expert, entitled to rely on outside sources for his opinion and, more significantly, the principles Mr. Verret is applying are generally accepted ones. I agree. In my opinion, the cross-over of expertise does not affect reliability and, even if it does where, for example, the particular expert's qualifications are challenged, that is a matter of weight for the trier of fact. Moreover, I am of the opinion that the probability calculations are not only mathematical but involve no subjective judgment. Therefore there is little, if any, chance of abuse in specific cases.

50 The real issue with respect to probability evidence is, as noted by Langdon J. in **Johnston**, the "assumptions which underlie the population genetics data". This issue was outlined by McCormack and Foote (at pages 86 and 87):

The second major area of controversy is the use of the statistical probability of a match, and how this is expressed to a jury. The use of statistical probability based on random sampling of population frequencies has been used extensively in traditional serology for many years without serious challenge. However, because the statistical probabilities of a coincidental match in DNA cases are very low, which has the practical effect of a positive identification, the use of statistical probability is now being challenged.
In order to provide the information necessary to predict gene frequencies for the general population, it is necessary to have a population data base. The frequency of a given allele in the population is derived from the data base. Once this frequency is known, one can then calculate the probabilities that a match could arise by chance.

Implicit in the challenge to the use of probabilities is a challenge to certain principles of population genetics. One of the foundations of population genetics is the principle that gene frequencies will remain constant from generation to generation so long as mating remains random. This principle is known as the Hardy-Weinberg equilibrium, and is expressed by an algebraic equation. Although there were some initial challenges as to whether populations in a given data base were in the Hardy-Weinberg equilibrium, this controversy has essentially been resolved by the majority of scientists. The calculation is a mathematical one and can be done by statistician, population geneticist or other qualified expert. A more cogent question is whether the appropriate matching population data base has been used. It is clear that there should be separate data bases for every major racial and ethnic subpopulation represented in the general population. Population geneticists use information from a small group (the data base) and then extrapolate to a larger population. However, critics argue that the assumptions may not hold true among some ethnic and racial subgroups.

The existence of population substructure is recognized by population geneticists. However, they disagree on the effect of substructure on the allele frequencies, in particular, data bases and the probability estimates derived from such a data base. The effect of population substructure was discussed at length in **U.S. v. Yee**, and the Court concluded that this was an issue of weight, not admissibility. The reasons for such a conclusion may be as, the Court in **Jakobetz** pointed out that "[t]he genotype frequency calculations are largely mathematical, involving no subjective judgments, and that they therefore do not lend themselves to abuse in specific applications." Although **U.S. v. Yee** has resolved this issue in one jurisdiction for the time being, it is clear that the issue of substructure is one which will be revisited.

51 In this case there is no Dogrib data base to apply the "Hardy-Weinberg equilibrium" to in the probability estimates. Is this fatal? I think not. In saying that I

recognize that the population base which is used to calculate the probability of the frequency of occurrence of any gene type must be a pertinent one. But we have evidence in this case of data bases of other native subgroups; we have evidence of the studies in the scientific literature showing that even with variations in sub-groups the findings are generally similar; and we have evidence that, under any circumstances, it would be rare to find 4 matching probes at random in any population group. If these assumptions are to be attacked, then they would have to be attacked by contrary expert evidence. Then it becomes a matter of weight for the trier of fact, not admissibility.

52 It may become a matter of admissibility if the racial group was a distinctively different one in a significantly isolated area. In that case it may be said that the lack of any data base of a reasonably similar group undermines the fundamental assumptions so as to make the evidence unreliable.

53 There are two further points that arise as part of this issue.

54 The first point involves the relative nature of this probability evidence, and by that I mean its relation to the evidence as a whole in the case at hand. In my opinion, one cannot say that any evidence is inherently unreliable in isolation. The value of any evidence depends on the circumstances of the particular case. With respect to estimates of probability, it may make very little difference whether the estimate is 1 in 5000 or 1 in 50,000,000 if the significance of those estimates is left unexplained to the untrained trier of fact, whether it be judge or jury. In either case the figure alone may overwhelm

the trier. This is why the evidence must be placed in context.

Earlier I made the comment that the population of a specific group makes no difference to the genetic frequency ratios. That is, from what I can gather from what I have heard and read, true from a statistical perspective. The population, however, as noted by Mr. Verret, may have "forensic significance".

Where a suspect is a member of a particular small group, as in this case, the power of the DNA evidence may be substantially impaired in its "statistical" significance due to the lack of a data base for that particular group. But, if the population is small, then the pool of possible suspects is also small and therefore the evidence has greater "forensic" significance.

For example, if the probable frequency is 1 in 5000 but the population (or suspect pool) is 1 million, then there would be 200 possible perpetrators. If, however, the population is only 5000, then there is a greater chance that there is only one possible perpetrator. So, if the probability ratio is 1 in 5200, 1 in 6300, or 1 in 7900, as here estimated by Mr. Verret, and the population, or suspect pool, is less than 2500 (since presumably only a male can be the perpetrator since semen was located), then the odds are even greater that the particular suspect's DNA is the one identified by the test. Coupled with other evidence, the addition of the DNA evidence means that there is more evidence in total against the accused. But, again, this is a matter of weight, not admissibility.

58 The second point involves the opinion evidence that the probability of any one or more match is "remote". In this case the test results revealed a four probe match with statistical significance. Mr. Verret's opinion was that a four probe match is extremely rare in unrelated individuals and that there is no mention in the literature of a four probe match. Crown counsel submits that, even if the statistical probability evidence is rejected, the trier of fact can still be given the expert's opinion regarding the four probe match. I agree. As noted by Walsh (at page 471):

> As an aside, however, and strictly speaking, the existence of a matching DNA profile is not devoid of any meaning simply because there may not be, for whatever reason, available statistical figures to assign to it. To the contrary, a DNA scientist can provide probative evidence by noting that the existence of the match is consistent with the samples having come from the same source and, further, by relating whether he or she has ever observed or, in their experience, are aware of, for example, a three, four or five probe match between different individuals at these highly polymorphic areas of DNA (apart from identical twins). These are empirical observations not dependent on population genetics, but, admittedly not nearly as probative as the statistics generated by projecting probabilities in a population using the science of population genetics.

59 I notice that in the two cases that rejected the use of statistical evidence, **Bourguignon and Baptiste**, the experts were still allowed to give their opinion in terms of the probability being "remote". I note as well, however, that all other cases have rejected this distinction and allowed the statistical evidence. In my opinion, both the statistical evidence and the general opinion evidence have probative value and are reliable. Any concerns are, again, matters of weight and not admissibility.

60 Finally, is the evidence helpful? This can be discussed within the concepts of helping or hindering the trier of fact and the probative value as opposed to the prejudicial

effect.

Many commentators have stated that there is a potential with DNA evidence to overwhelm the trier of fact; and here they invariably refer to juries. The argument is that DNA evidence has such an aura of scientific truth that juries will invariably accept the expert opinion to the exclusion of other evidence. Further, the statistical probabilities given in many cases are so large (in the range of one in millions) that juries will be overwhelmed by such figures and thereby ignore the principle of reasonable doubt. In other words, the trier of fact will take this evidence as proof, not opinion.

In addition, there is the argument that this science is so new that it is still evolving so there is a danger in placing too much reliance on its current state.

The sum of these arguments is that DNA evidence may be more a hindrance than a help and that its use is so prejudicial to the accused that its probative force should be ignored. This argument, however, ignores a number of factors.

First, this argument ignores the basic proposition about our rules of evidence noted earlier, that is that any evidence which relates to a fact in dispute and can aid in the proof thereof is relevant and *prima facie* admissible. Second, it also ignores a general trend to inclusiveness of evidence and giving a jury all the information relevant to the issues in the case. As stated by Dickson C.J.C. in **R. v. Corbett** (1988), 41 C.C.C. (3d) 385 (S.C.C.) at page 400:

> Rules which put blinders over the eyes of the trier of fact should be avoided except as a last resort. It is preferable to trust the good sense of the jury and to give the jury all relevant information, so long as it is accompanied by a clear instruction in law from the trial judge regarding the extent of its probative value.

65 Concerns about the potentially prejudicial effect of any expert evidence on the jury's assessment of guilt is always present. But it must be remembered that by "prejudice" our law means that the acceptance of such evidence could operate unfairly and unjustly, not merely unfavourably to the accused: **R. v. Corbett** (page 424). Our law has long recognized the ability, and indeed the responsibility, of the trial judge to give suitable warnings and instruction to the jury as to the permissible uses that can be made of expert or any evidence. After all, for example, our law has long recognized the requirement of special instructions when the trier of fact is assessing the most basic identification evidence, that being eyewitness identification.

66 The best illustration of the probative force of DNA evidence, and its helpfulness, is the situation where a test results in an exclusion of the suspect. It is accepted that such a result will result in a dismissal. The first recorded Canadian case of the use of DNA evidence was **R. v. Parent** (1988), 46 C.C.C. (3d) 414 (Alta. Q.B.). There was no discussion of the admissibility of the DNA evidence in that case because it was admitted by consent. There was no match with the accused in that test, so the related charges were dismissed. If there is no match then, even if it cannot be said that innocence is established, at least there is a reasonable doubt.

67 My aim in these extensive reasons is to show that any arguments about DNA

evidence, assuming that generally accepted procedures and criteria have been used, are matters of weight for assessment by the trier of fact. With DNA evidence, as with any other evidence, the trier of fact can accept or reject it. The instructions needed to assist the trier of fact in the assessment of this evidence will depend on the circumstances of each case. In my opinion, as stated earlier, I see no reason why this type of evidence should be presumptively treated any differently than other expert evidence.

For the foregoing reasons, I ruled that the DNA typing evidence in this case is admissible.

It should be readily apparent from these reasons that I do not think a *voir dire* is necessary in every case where DNA evidence is to be put before the trier of fact. It should only be necessary where the opposing side challenges the methodology of the particular testing and analysis that was done. To give only some examples, an objection may be raised because the samples were taken in a manner that questions their integrity or may raise a Charter issue, or there was a lack of continuity in the security of the samples, or the tests were not performed in accordance with accepted procedures, or the statistical analysis is based on erroneous assumptions. Even some of these issues may more properly be considered as matters going to weight and not admissibility. And all of this assumes that there will be evidence to support the challenge to admissibility. It is important to keep in mind that I am here talking only about admissibility, not the weight to be put on any evidence.

70 There is also, of course, the objection that the proffered evidence is so tangential to the issues in the case that its probative force is minimal in relation to its potential prejudice. The power to exclude the evidence in such a situation accords with the general jurisdiction of the trial judge to exclude evidence where its potential prejudice outweighs any probative force it may possess.

71 Finally, this discussion raises a fundamental point about the ability of an accused person to make full answer and defence. DNA typing evidence is not only new and complex, it is undoubtedly expensive and time-consuming. Many of the present facilities, and likely most of the expertise available in Canada for doing this work, are under the control of law enforcement officials. For an accused to mount an effective defence on substantive grounds would require financial resources beyond the capability of all but a rare few of the people who come before the criminal courts. For that reason, I think it is incumbent on the state to try to redress this imbalance. One way is for the Crown to make complete and timely disclosure of the results as well as the methodology of the testing to be submitted as evidence. I note that in this case Crown counsel made his expert witness available for a meeting with defence counsel before trial. This approach is to be commended. Another way is for the administrators of our legal aid programmes to examine carefully the need for independent evidence in each case and then, if satisfied that such a need is present, authorize reasonable expenditures for it.

In closing, I thank both counsel for their excellent work in the presentation of a complex issue.

John Z. Vertes
J.S.C.

Counsel for the Crown: Dennis Claxton

Counsel for the Accused: Thomas Boyd

APPENDIX

Articles:

1. P. Alldridge, "Recognising Novel Scientific Techniques: DNA as a Test Case", (1992) Crim. Law Review 669.

2. M. Lussier, "Tailoring the Rules of Admissibility: Genes and Canadian Criminal Law" (1992), 71 Can. Bar Review 319.

3. H. McCormack & S. Foote, "A New Type of Identification Evidence: The Admissibility of DNA Typing", (1992) 7 C.R. (4th) 77.

4. J. Walsh, "The Population Genetics of Forensic DNA Typing: 'Could it Have Been Someone Else?'" (1992), 34 Criminal Law Quarterly 469.

Cases:

1. **R. v. Baptiste**, B.C.S.C., July 15, 1991.

2. **R. v. Bourguignon**, Ont. Ct. (Gen. Div.), January 14, 1991.

3. **R v Fortune**, Ont. Ct. (Gen. Div.), October 15, 1992.

4. **R. v. Hunt & Keenan**, Ont. Ct. (Gen. Div.), December 11, 1990.

5. **R. v. Jack**, Man. Q.B., October 21, 1992.

6. **R. v. Johnston** (1992), 69 C.C.C. (3d) 395 (Ont. Ct. Gen. Div.).

7. **R. v. Legere**, N.B.Q.B., August 29, 1991 (leave to appeal granted).

8. **R. v. McNally**, Ont. Dist. Ct., April 5, 1991.

9. **R. v. Robson**, B.C.S.C., October 23, 1992.

10. **R. v. Singh**, B.C. Prov. Ct., July 3, 1992.

11. **R. v. Terceira**, Ont. Ct. (Gen. Div.), September 30, 1992.

12. **R. v Wells**, Ont. Ct. (Gen. Div.), October 21, 1991.

CR 01688

IN THE SUPREME COURT OF THE
NORTHWEST TERRITORIES

BETWEEN:

HER MAJESTY THE QUEEN

- and -

ROY LAFFERTY

REASONS FOR JUDGMENT OF THE
HONOURABLE MR. JUSTICE JOHN Z. VERTES