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524 N.W.2d 763
246 Neb. 953, 63 USLW 2399
STATE of Nebraska, Appellee,
v.
Asa T. CARTER, Appellant.
No. S-93-777.
Supreme Court of Nebraska.
Dec. 2, 1994.

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Syllabus by the Court

1. Appeal and Error. An appellate court does not consider errors which are argued but not assigned.

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2. Rules of Evidence: Other Acts. Neb.Rev.Stat. § 27-404(2) (Reissue 1989) is a rule of inclusion, rather than exclusion, and permits the use of relevant bad acts for all purposes except to prove the character of a person in order to show that the person acted in conformity with that character.

3. Rules of Evidence: Other Acts. Evidence which is otherwise admissible under Neb.Rev.Stat. § 27-404(2) (Reissue 1989) may be excluded under Neb.Rev.Stat. § 27-403 (Reissue 1989) if its probative value is substantially outweighed by other considerations.

4. Rules of Evidence: Other Acts: Appeal and Error. This court reviews the admission of evidence of other acts under Neb.Rev.Stat. § 27-404(2) (Reissue 1989) by considering (1) whether the evidence was relevant, (2) whether the evidence had a proper purpose, (3) whether the probative value of the evidence outweighed its potential for unfair prejudice, and (4) whether the trial court, if requested, instructed the jury to consider the evidence only for the purpose for which it was admitted.

5. Rules of Evidence. In all proceedings where the Nebraska Evidence Rules apply, admissibility of evidence is controlled by the Nebraska Evidence Rules, not judicial discretion, except in those instances under the Nebraska Evidence Rules when judicial discretion is a factor involved in the admissibility of evidence.

6. Rules of Evidence: Other Acts: Appeal and Error. Because exercise of judicial discretion is implicit in Neb.Rev.Stat. § 27-401 (Reissue 1989), it is within the discretion of the trial court to determine relevancy and admissibility of evidence of other wrongs or acts, and the trial court's decision will not be reversed absent an abuse of that discretion.

7. Trial: Words and Phrases. Judicial abuse of discretion means that the reasons or rulings of the trial court are clearly untenable, unfairly depriving a litigant of a substantial right, and denying a just result in matters submitted for disposition.

8. Sexual Assault: Evidence: Other Acts. Sexual crimes are offenses in which evidence of other similar sexual conduct has independent relevance, and such evidence may be admissible whether that conduct involved the complaining witness or third parties.

9. Sexual Assault: Evidence: Other Acts: Proof. Evidence of repeated incidents may be especially relevant in proving sexual crimes committed against persons otherwise defenseless due to age--either the very young or the elderly.

10. Other Acts: Evidence. Prior acts need not be identical to the act charged in order to be admissible. It is sufficient that the evidence be of similar involvement reasonably related to the charged conduct and be presented in a manner in which prejudice does not outweigh its probative value.

11. Other Acts: Evidence. Where there are an overwhelming number of significant similarities, evidence of prior acts may be admitted.

[246 Neb. 954] 12. Other Acts: Evidence. The question in determining admissibility of evidence of prior acts is whether the crimes are so similar, unusual, and distinctive that the trier of fact could reasonably find that they bear the same signature. If so, the evidence may be admitted, and any dissimilarities merely go to the weight of the evidence.

13. Trial: Evidence. Balancing the probative value of evidence against the danger of unfair prejudice is also within the discretion of the trial court.

14. Rules of Evidence. The fact that evidence is prejudicial is not enough to require exclusion, because most, if not all, of the evidence a party offers is calculated to be prejudicial to the opposing party. It is only the evidence

which has a tendency to suggest a decision on an improper basis that is unfairly prejudicial under Neb.Rev.Stat. § 27-403 (Reissue 1989).

15. Trial: Evidence: Jury Instructions. In any situation in which a limiting instruction was given at the time evidence

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was introduced, NJI2d Crim. 5.3 must be given at closing if requested.

16. Trial: Statutes: Judgments: Time. When there has been a subsequent change in the law, it is the duty of the trial court to render a decision which reflects any change in the applicable law which occurred in the interval between the time the judge made rulings of law and the time judgment is pronounced.

17. Trial: Rules of Evidence: Expert Witnesses. In a DNA case, the trial court is to decide preliminarily, outside the presence of the jury, on the basis of the evidence before it: (1) whether the witnesses on the DNA issue are experts in the relevant scientific fields, (2) whether DNA testing used in the case under consideration is generally accepted by the relevant scientific communities, (3) whether the method of testing used in the case under consideration is generally accepted as reliable if performed properly, (4) whether the test conducted properly followed the method, (5) whether PCR DNA analysis evidence is more probative than prejudicial under Neb.Rev.Stat. § 27-403 (Reissue 1989), and (6) whether statistical probability evidence interpreting PCR analysis results is more probative than prejudicial.

18. Trial: Evidence. The calculation of statistical probability is an essential part of the process used in determining the significance of a DNA match; therefore, the underlying method of arriving at the calculation must also meet the Frye- Houser general acceptance test.

19. Trial: Evidence. Evidence of a DNA match will not be admissible if it has not been accompanied by statistical probability evidence that has been calculated from a generally accepted method.

20. Rules of Evidence. Although evidence may be relevant, Neb.Rev.Stat. § 27-403 (Reissue 1989) provides that it may be excluded if the evidence is more prejudicial than probative.

21. Trial: Evidence: Appeal and Error. To limit the statistical frequency evidence in DNA cases to two racial groups when the racial or ethnic background of the perpetrator is unknown is prejudicial under any circumstances.

22. Criminal Law: Trial: Juries: Evidence: Appeal and Error. In a jury trial of a criminal case, whether an error in admitting or excluding evidence reaches a constitutional dimension or not, an erroneous evidential ruling results in prejudice to a defendant unless the State demonstrates that the error was [246 Neb. 955] harmless beyond a reasonable doubt.

23. Verdicts: Juries: Evidence: Appeal and Error. An error is harmless when the improper admission of evidence did not materially influence the jury to reach a verdict adverse to the substantial rights of the defendant.

24. Verdicts: Juries: Evidence: Appeal and Error. It is harmless error only if the appellate court is convinced beyond a reasonable doubt that the erroneous admission of the evidence could have had no influence on the jury's judgment.

Thomas M. Kenney, Douglas County Public Defender, and Thomas C. Riley, Omaha, for appellant.

Don Stenberg, Atty. Gen., and Donald A. Kohtz, Lincoln, for appellee.

HASTINGS, C.J., BOSLAUGH, WHITE, CAPORALE, FAHRNBRUCH, LANPHIER, and WRIGHT, JJ.

PER CURIAM.

Following a trial by jury, the defendant, Asa T. Carter, was found guilty of first degree murder. The information alleged that the death of the victim had occurred during the perpetration of a sexual assault in the first degree. The defendant has appealed, assigning error on the part of the trial court in admitting testimony of prior bad acts by the defendant and in admitting evidence concerning DNA testing and the results thereof.

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On October 20, 1990, at approximately 12:30 p.m., Omaha Police Officer Kevin Cunningham was advised that the body of the victim, a 9-year-old girl, had been found in an area immediately to the rear of the apartment house in Omaha in which the defendant resided with his wife, Gwelder Carter. Shortly thereafter, the defendant was arrested at the University of Nebraska Medical Center, where he was visiting his father. The defendant, along with his wife, was taken to the police station. Earlier that day, at approximately 12:15 p.m., Officer Cunningham had been directed to make contact with the defendant. At that time, the defendant told the officer that he had been informed that a little girl was missing and that a [246 Neb. 956] warrant had been sworn out for him, and he wanted to know if he was wanted. After checking, the officer advised the defendant that there was no warrant on him.

Although Gwelder Carter initially indicated that the defendant had nothing to do with the victim's death, she later told police that he had been responsible. Most of the details leading up to this death were obtained through the

testimony of the defendant's wife. According to her, on the evening of October 19, 1990, the victim stayed overnight at the apartment of the defendant and his wife. The defendant's wife was the victim's godmother, and she was considered by the victim's family to be her "second mother." The girl had previously stayed overnight at the Carters' home, although from the record it is unclear how many times this had occurred.

The victim arrived at the Carters' in the early evening. The defendant was present at the apartment when she arrived; however, he left shortly afterward. After the defendant left, two of his friends, Lanny Hicks and David Harpster, came looking for him. Only because it will become relevant during later discussions in this case, we point out that Hicks and Harpster were white, defendant was black. Shortly thereafter, the defendant returned home. During the course of the evening and into the early morning hours, the defendant, Hicks, and Harpster periodically came to and went from the apartment. During the coming and going, Gwelder Carter and the victim remained in the bedroom. At no time did Hicks and Harpster have any contact with the victim, and eventually, they left the apartment.

Gwelder testified that at approximately 4:15 a.m., the defendant came into the bedroom and got into bed. She stated that she could smell liquor on his breath. According to Gwelder, the defendant became sexually aroused and initially indicated that he wanted to "make love" to her, but then he stated that he wanted to make love to the victim, who was sleeping in the same bed as the defendant and his wife. The defendant told his wife that if she loved him or cared anything about him, she would let him make love to the victim. Upon hearing this, Gwelder left the apartment. When she left, the victim was asleep and wearing a blue nightgown. When she returned approximately [246 Neb. 957] 40 to 45 minutes later, she was met by the defendant, who stated, "I didn't mess with her." Upon hearing this, Gwelder entered their bedroom and observed the victim lying naked faceup on the bed. According to Gwelder's observations, the victim's body was limp and she had no pulse.

Gwelder further testified that the defendant threatened her. She stated that he told her that she must "stick by his side" or the "same thing could happen to [her]" and indicated that "if he [went] down," he would take her "down with him." She then left the apartment for a short time. When Gwelder returned, she watched the defendant carry the victim's then-clothed body out of the apartment.

When defendant returned a short time later, Gwelder watched him place the sheets from the bed into the bathtub, where other items were soaking. After doing this, the defendant left the apartment. Soon after he left, Gwelder telephoned the victim's mother and told her that her daughter was missing, that she had gone to the 7-Eleven store and when she returned, the girl was gone. The victim's mother contacted the Omaha Police

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Division, and a search for the victim was initiated. Shortly thereafter, Gwelder received a telephone call from the defendant, asking her to meet him at a friend's house. The friend, Margaret Williams, testified that the defendant arrived at her home at about 8 a.m. According to her, the defendant initially seemed normal; however, when someone he did not recognize knocked on her door, he looked through the peephole and told her, "Don't open the door, don't open the door," and she noticed that he started to act nervous. When Gwelder arrived at approximately 10 a.m., Williams heard her say to the defendant, "But, Asa, you know you were wrong, though." She also noticed that for approximately 5 or 10 minutes, they continued to talk quietly between themselves. After their conversation, the Carters left the Williams residence and walked to University Hospital to visit the defendant's father, who was a patient there at the time. During this walk, the defendant again threatened her. As previously stated, defendant was arrested on suspicion of murder later that day.

An autopsy of the victim's body revealed that she had been subjected to anal and vaginal penetration shortly before her [246 Neb. 958] death and that the cause of her death was asphyxiation, most likely caused by the compression of her chest. Dr. Jerry Jones, the pathologist who performed the autopsy, testified that his examination detected the presence of sperm in her anus, and he concluded that the victim died because of "asphyxiation due to smothering and mechanical asphyxiation from overlaying by an adult during the act of sexual assault."

After this initial examination, laboratory tests were conducted at the Nebraska State Patrol Criminalistics Laboratory on evidence taken from the crime scene and on samples taken from the victim's body and clothing. Forensic serologist Vicki Cowan testified at trial that semen was present in the crotch and back area of the victim's underwear and on an anal swab taken from the victim. Evidence of human blood was also found on the vaginal and anal swabs, a red washcloth, a white towel, a blue shirt found in the bathtub, the fitted and flat sheets from the bed, the defendant's jacket pocket, fingernail scrapings taken from the victim, the victim's underwear, and the victim's blue jeans. One Caucasian head hair and one Negroid hair fragment were discovered on the outside of the victim's underwear.

According to Cowan, an examination revealed that the Negroid hair fragment was too small to make any identification and that the Caucasian head hair could not have come from either the defendant or the victim. Cowan

stated that the presence of a Caucasian head hair does not mean the hair was on a person's head at the time of contact, but only that a Caucasian head hair came into contact with the outside of her underwear. Cowan further testified that the technology she had available at the Nebraska State Patrol Criminalistics Laboratory to test the samples had generated inconclusive test results--they neither included nor excluded the defendant.

The prosecution then elected to submit anal and vaginal swabs, as well as cuttings from the victim's underwear and the crotch area of her blue jeans, to "Life Codes," a New York laboratory, for restriction fragment length polymorphism (RFLP) DNA or "DNA fingerprint" testing in an attempt to identify the donor of the semen. The RFLP DNA methodology is discussed in detail in State v. Houser, 241 Neb. 525, 490 [246 Neb. 959] N.W.2d 168 (1992). Richard Cunningham, a scientist at Life Codes laboratory, testified that an initial analysis of the samples indicated that human sperm was present on the anal swab and the crotch and back areas of the victim's underwear. However, he was of the opinion that due to the degradation of the DNA samples, there was an insufficient amount of high molecular weight DNA in this case to permit RFLP DNA analysis.

After Life Codes determined it could not conduct RFLP DNA analysis on the samples, the samples were sent to Forensic Science Associates (FSA), a California laboratory, for polymerase chain reaction DNA amplification (PCR DQ Alpha DNA) analysis. The PCR DQ Alpha DNA test requires much less

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DNA material than the RFLP test and differs from the RFLP test in that it does not identify the donor of the sperm, but, rather, answers the question of whether a suspect can be eliminated as a donor.

FSA performed the tests and was able to identify sufficient quantities of DNA material to draw some conclusions. Jennifer Mihalovich, a criminalist from FSA, conducted the PCR test on the sperm found on the anal swab and the crotch area of the blue jeans. These are considered as donor's samples. She compared the donor's genotype with the genotype of the biological reference samples taken from the victim, the defendant, Hicks, and Harpster. The genotype of the donor matched that of the known reference sample of the defendant. As a result of her tests, Mihalovich concluded that the defendant could not be excluded as a possible donor of the sperm; however, each of the other males present at the Carter residence, Hicks and Harpster, could be eliminated based on nonmatching PCR genotypes.

In addition to the evidence of a match, the jury also heard evidence relating to the frequency with which one could expect to find such a match among samples taken from given populations. Mihalovich testified that approximately 7 percent of the white population and 10 percent of the black population has the same genotype as the defendant.

EVIDENCE OF PRIOR BAD ACTS

We discuss first the issue regarding the admission of prior [246 Neb. 960] bad acts on the part of the defendant.

The State called as witnesses the half sister of the defendant, An. C., and the defendant's daughters from a previous marriage, L.C. and A.C. Each of these witnesses testified that as a young child, she had been sexually assaulted by the defendant.

An. C. testified that in 1979 or 1980, when she was 6 or 7 years old, the defendant would babysit her at his house. On several occasions when she spent the night, the defendant would vaginally and anally sexually assault her. According to her, this would not occur on a consistent basis, but only when she spent the night at his house. These sexual assaults stopped when she was 10 or 11. The defendant's daughter L.C. testified that when she was 7, she was placed in a foster home because the defendant sexually assaulted her. According to her, she did not report the defendant for a long time. Over the objections of the defendant, she also testified that she had been treated for gonorrhea when she was in the third grade.

A.C. testified that when she was 6 years old, she was also placed in a foster home because her father, the defendant, sexually assaulted her. She stated that the defendant would say, "I love you. You're my favorite child," when he wanted to have sex with her. These assaults would occur either in her bedroom or at her grandmother's house.

The defendant filed motions in limine to exclude the proffered testimony of his previous sexual assaults of his half sister, his daughters, and T.K., an acquaintance, on the basis that it violated Neb.Rev.Stat. §§ 27-403 and 27-404 (Reissue 1989). Following a hearing, the court sustained the defendant's motion as to the acquaintance and overruled the motions pertaining to the half sister and the two daughters. The court found that the proffered testimony was admissible to show motive, opportunity, intent, preparation, and identity. In a portion of the court's written order, the court stated:

If the case of [T.K.] is excluded, an examination of the facts surrounding the sexual assaults of the other three victims, namely, [An. C., L.C., and A.C.], may provide potential answers for consideration by a jury. Each of these three victims was between the ages of six and twelve [246 Neb. 961] when they were subjected to multiple sexual

assaults. [An. C.], at the time of her assaults, had Asa Carter, her brother, as her babysitter. [A.C. and L.C.], when their mother was not present, were in the care or custody of their father. In these circumstances, he subjected them to sexual assaults. Each of these three victims was

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very young and, under the law, incapable of giving consent. In each of these settings, Asa Carter was in a custodial role. In short, he had complete control....

When one reviews [§ 27-404(2)], words such as motive, opportunity, intent, preparation and identity seemingly jump off the written page. Surely these offenses would be relevant to a jury for consideration of these enumerated points. This Court finds sufficient similarity of the acts to conclude that they are relevant to this prosecution. Further, this Court believes that this analysis would apply to any jurisdiction.

Next, the Court is required to do a balancing test under [§ 27-403]. The Court finds that it is clear that the probative value of this evidence outweighs the prejudice that may come to the Defendant.

Again over the objections of the defendant at trial, the court admitted the testimony of the half sister and two daughters and gave the jury a limiting instruction. The defendant appeals the denial of his motion and the subsequent admission of the testimony of L.C. and A.C. The defendant, in his brief, also raises an argument pertaining to the erroneous admission of An. C.'s testimony; however, he does not raise this issue in his assignments of error. The defendant's assignment of error relating to admission of other acts testimony challenges only the trial testimony of A.C. and L.C.

This court has held that an appellate court does not consider errors which are argued but not assigned. See State v. Brandon, 240 Neb. 232, 481 N.W.2d 207 (1992). See, also, State v. Dyer, 245 Neb. 385, 513 N.W.2d 316 (1994) (to be considered by an appellate court, an error must be assigned and discussed in the brief of one claiming that prejudicial error has occurred).

The statutes on which the defendant relies are §§ 27-404(2) and 27-403. This court has firmly established that § 27-404(2) is [246 Neb. 962] a rule of inclusion, rather than exclusion, and permits the use of relevant bad acts for all purposes except to prove the character of a person in order to show that the person acted in conformity with that character. See, State v. Perrigo, 244 Neb. 990, 510 N.W.2d 304 (1994); State v. Martin, 242 Neb. 116, 493 N.W.2d 191 (1992); State v. Stephens, 237 Neb. 551, 466 N.W.2d 781 (1991); State v. Yager, 236 Neb. 481, 461 N.W.2d 741 (1990); State v. Boppre, 234 Neb. 922, 453 N.W.2d 406 (1990).

Section 27-404(2) provides:
Evidence of other crimes, wrongs, or acts is not admissible to prove the character of a person in order to show that he or she acted in conformity therewith. It may, however, be admissible for other purposes, such as proof of motive, opportunity, intent, preparation, plan, knowledge, identity, or absence of mistake or accident.

The list of acceptable uses recited in the statute is illustrative and not intended to be exclusive. State v. Perrigo, supra; State v. Martin, supra; State v. Stephens, supra; State v. Yager, supra. However, evidence which is otherwise admissible under § 27-404(2) may be excluded under § 27-403 if its probative value is substantially outweighed by other considerations. State v. Wood, 245 Neb. 63, 511 N.W.2d 90 (1994).

Therefore, we review the admission of evidence of other acts under § 27-404(2) by considering (1) whether the evidence was relevant, (2) whether the evidence had a proper purpose, (3) whether the probative value of the evidence outweighed its potential for unfair prejudice, and (4) whether the trial court, if requested, instructed the jury to consider the evidence only for the purpose for which it was admitted. State v. Wood, supra; State v. Martin, supra; State v. Stueben, 240 Neb. 170, 481 N.W.2d 178 (1992); State v. Stephens, supra.

In reviewing the admissibility of evidence, this court has instructed that in all proceedings where the Nebraska Evidence Rules apply, admissibility of evidence is controlled by the Nebraska Evidence Rules, not

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judicial discretion, except in those instances under the Nebraska Evidence Rules when judicial discretion is a factor involved in the admissibility of evidence. See State v. Wood, supra. Although the word "discretion," in one form or another, does not appear in either [246 Neb. 963] Neb.Rev.Stat. § 27-401 (Reissue 1989) or § 27-403, nevertheless, judicial discretion, as a factor in admissibility, is implicit in § 27-401, concerning the admission of relevant evidence, and § 27-403, regarding exclusion of relevant evidence. State v. Perrigo, supra.

Because exercise of judicial discretion is implicit in § 27-401, it is within the discretion of the trial court to determine relevancy and admissibility of evidence of other wrongs or acts, and the trial court's decision will not be reversed absent an abuse of that discretion. State v. Wood, supra; State v. Bronson, 242 Neb. 931, 496 N.W.2d 882 (1993).

Judicial abuse of discretion means that the reasons or rulings of the trial court are clearly untenable, unfairly depriving a litigant of a substantial right, and denying a just result in matters submitted for disposition. State v. Thomas, 238 Neb. 4, 468 N.W.2d 607 (1991).

Bearing these standards in mind, we turn our attention to whether the evidence that the defendant had recurring sexual contact with his two daughters and his half sister is relevant to the charge of murder in the first degree in the commission of or the attempt to commit a sexual assault. The relevant portion of Neb.Rev.Stat. § 28-303 (Reissue 1989) provides: "A person commits murder in the first degree if he kills another person ... (2) in the perpetration of or attempt to perpetrate any sexual assault in the first degree...." Sexual assault in the first degree, as provided by Neb.Rev.Stat. § 28-319 (Reissue 1989), is as follows:

(1) Any person who subjects another person to sexual penetration and (a) overcomes the victim by force, threat of force, express or implied, coercion, or deception, (b) knew or should have known that the victim was mentally or physically incapable of resisting ... or (c) the actor is nineteen years of age or older and the victim is less than sixteen years of age is guilty of sexual assault in the first degree.

This court has consistently stated that sexual crimes are offenses in which evidence of other similar sexual conduct has independent relevance, and such evidence may be admissible whether that conduct involved the complaining witness or third [246 Neb. 964] parties. See, State v. Martin, 242 Neb. 116, 493 N.W.2d 191 (1992); State v. Stephens, 237 Neb. 551, 466 N.W.2d 781 (1991); State v. Craig, 219 Neb. 70, 361 N.W.2d 206 (1985).

In State v. Martin, supra, this court noted that evidence of repeated incidents may be especially relevant in proving sexual crimes committed against persons otherwise defenseless due to age--either the very young or the elderly. Without proof by other acts of a defendant, except in cases of the fortuitous presence of an eyewitness, those crimes would likely go unpunished. Accord State v. Stephens, supra. See, also, State v. Keithley, 218 Neb. 707, 358 N.W.2d 761 (1984). Therefore, the trial court did not abuse its discretion in determining the evidence was relevant.

Next, we must determine whether the evidence had a proper purpose. The defendant contends that the only logical purpose for which this evidence could be admitted is to show his propensity to commit a sexual assault of a child, a purpose specifically excluded by statute.

We begin by looking at the numerous similarities between the sexual assaults of the half sister and daughters and the sexual assault of the victim in the present case.

* All of the assaults occurred when the victims were very young girls--ages 6 to 10 or 11 years old.
* All of the victims were subjected to multiple assaults.
* All of the assaults occurred at the defendant's residence, his mother's residence, or the victim's residence.

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* All of the victims either had a familial or family-like relationship to defendant.
* All of the assaults occurred while the defendant had custody or was in complete control of the victims.
* Each of the victims, under the law, was incapable of giving consent.

Concededly, some differences between these crimes do exist. The defendant's relationship with the victim was not familial; however, it was family-like in that she was his wife's goddaughter. In addition, only An. C. testified that she had been subjected to anal penetration, as was the victim in this case. However, these differences, standing alone, do not compel the exclusion of the evidence. An absolute identity in [246 Neb. 965] every detail cannot be expected. State v. Phelps, 241 Neb. 707, 722, 490 N.W.2d 676, 688 (1992) ("the prior acts need not be identical to the act charged in order to be admissible. It is sufficient that the evidence be of similar involvement reasonably related to the charged conduct and be presented in a manner in which prejudice does not outweigh its probative value").

Where there are an overwhelming number of significant similarities, the evidence of prior acts may be admitted. State v. Bible, 175 Ariz. 549, 858 P.2d 1152 (1993). "The term 'overwhelming' does not require a mechanical count of the similarities but, rather, a qualitative evaluation." Id. at 576, 858 P.2d at 1179. The question is whether the crimes are so similar, unusual, and distinctive that the trial judge could reasonably find that they bear the same signature. Id. If so, the evidence may be admitted, and any dissimilarities merely go to the weight of the evidence. Id. We agree with the reasoning of the Arizona court in Bible.

The evidence in this case shows enough similarities for purposes of identity. Moreover, the evidence shows the defendant was motivated in each instance to choose a victim that was of a very young and vulnerable age, and one with whom he had a familial or family-like relationship. The combination of these factors placed the defendant in a position in which he could both control and manipulate his victims. Therefore, the evidence is also relevant for the purpose of showing the defendant's motive. For these reasons, the trial court did not abuse its discretion in finding the evidence was for a proper purpose.

More problematic is the issue of whether the admission of this evidence was more prejudicial than probative. Balancing the probative value of the evidence against the danger of unfair prejudice is also within the discretion of the trial court. State v. Phelps, supra. The fact that the evidence is prejudicial is not enough to require exclusion, because most, if not all, of the evidence a party offers is calculated to be prejudicial to the opposing party. Id. It is only the evidence which has a tendency to suggest a decision on an improper basis that is unfairly prejudicial under § 27-403. State v. Phelps, supra. Accord State [246 Neb. 966] v. Stephens, supra.

Because the first two factors under § 27-404(2) have been met, the question of whether the evidence was unfairly prejudicial hinges on whether the court properly instructed the jury as to its limited use. The court instructed the jury as follows:

During this trial I told you that certain evidence was received for a limited purpose. Specifically, I refer to the testimony of [An.C., L.C., and A.C.] regarding alleged sexual assaults.

Evidence of other crimes, wrongs, or acts should not be considered as proof that the Defendant acted in the same manner regarding the offense charged in this case.

It may be proof of motive, opportunity, intent, preparation, plan and identity.

The State of Nebraska is still required to prove beyond a reasonable doubt that the Defendant committed the offense with which he is charged on the date alleged in the Information filed by the State.

Also, at the time the evidence was first offered as to proof of other crimes, at the

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request of the defendant the trial court gave the following limiting instruction to the jury:

Ladies and gentlemen, the request by counsel is a proper one that the case law requires that I do give what's called a limiting instruction. And that means that the evidence of this witness and any other witnesses that may be called to testify as to other crimes, that that testimony can only be received for a limited purpose.

The first thing I would say to you is that under the statute, evidence of other crimes is not admissible to prove the character of a person, that is, meaning to try to prove a bad character by showing other crimes. And it is not allowable to show that the person in the offense charged, that is, the first degree murder charge here, it is not admissible to show that the person acted in conformity with that prior offense in this same offense that he's charged with in this court.

The evidence may be admitted for other purposes, and this is a limited purpose. The statute provides that it may [246 Neb. 967] be admissible for other purposes such as proof of motive, opportunity, intent, preparation, plan, knowledge, identity or absence of mistake or accident....

The main thing to emphasize is that you may not consider this evidence as to Mr. Carter's character, and in allowing testimony of other crimes, there is no change in the burden of proof. The burden of proof never shifts. It is always on the State of Nebraska to prove the offense of first degree murder beyond a reasonable doubt.

NJI2d Crim. 5.3 provides as follows: "During this trial I called your attention to some evidence that was received for specified limited purposes; you must consider that evidence only for those limited purposes and for no other." In any situation in which a limiting instruction was given at the time evidence was introduced, NJI2d Crim. 5.3 must be given at closing if requested. See, also, State v. Dush, 214 Neb. 51, 332 N.W.2d 679 (1983).

Although not following exactly the language of NJI2d Crim. 5.3, the trial court's instruction clearly directed the jury as to the limited use of the evidence. Because the evidence bears on the identity and motive of the assailant, it cannot be said that the evidence had a tendency to suggest a decision on an improper basis. Therefore, the trial court did not abuse its discretion in admitting the testimony of the defendant's prior sexual assaults.

WHETHER THE PCR DNA EVIDENCE WAS PROPERLY ADMITTED

The defendant, in his second assignment of error, asserts that the district court committed reversible error by allowing the admission of DNA evidence, and presents two arguments in support of his contention. He asserts that there is insufficient foundation for the reliability of PCR DNA methodology in forensics and that the procedure undertaken in the present case did not conform to the appropriate legal standard for determining the admissibility of DNA evidence. He also argues the absence of a reliable statistical data foundation.

In this case, we must consider for the first time the admissibility of evidence arising from the scientific technique of [246 Neb. 968] PCR DNA typing in criminal prosecutions. In State v. Houser, 241 Neb. 525, 490 N.W.2d 168 (1992), previously cited and to which we will also refer later, this court dealt with RFLP DNA analysis. The trial court in the instant case did follow the holding of Houser and conducted a Frye hearing. See Frye v. United States, 293 F. 1013 (D.C.Cir.1923). Its rulings were based on the Frye test.

In order to understand the legal issues relating to the admissibility of PCR DNA typing, it first is necessary to have a basic understanding of the scientific principles and techniques underlying that method.

In forensics, PCR DNA typing utilizes a technique in which a known reference sample containing the defendant's DNA is typed and the results are compared with the DNA typing

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results obtained from the sample recovered from the crime scene. If the results do not match, the defendant is excluded as a possible donor. If the results do match, the defendant is included as a possible source of the evidence sample, and a statistical calculation is made to determine the probability that another individual would also match the evidence sample.

DNA THEORY

According to Mihalovich, a criminalist employed by FSA, DNA is the organic material that contains the blueprint or code for the genetic characteristics of all living things. See, also, State v. Houser, supra. DNA is located in the chromosomes which are found in the nucleus of virtually every cell of the human body, including white blood cells, skin cells, semen cells, saliva cells, and cells surrounding hair roots. Within each individual, the DNA molecular structure is identical and remains constant throughout a human lifetime. What is particularly important for purposes of forensic application is the fact that no two individuals, with the exception of identical twins, have an identical DNA structure.

The molecular structure of DNA is commonly referred to as a "double helix" or twisted ladder similar to a spiral staircase. The sides of the ladder are composed of alternating molecules of sugar and phosphate. The "rungs" are composed of pairs of molecules called nucleotides. The most important component [246 Neb. 969] of the nucleotide is its organic base units. There are only four organic bases: adenine (A), guanine (G), cytosine (C), and thymine (T). In any given nucleotide, A always pairs or bonds with T, while C always pairs with G. Consequently, if a nucleotide contains a C on one side, then it can be inferred that the nucleotide contains a G on the other side.

There are several million nucleotides in each molecule of DNA. It is the precise order in which A, T, C, and G occur along the DNA ladder that creates a code that determines the various unique physiological traits of each human being. The different nucleotide sequences correspond with different physiological traits. The majority of the DNA molecule is similar from one person to the next; however, there are segments or genes within the molecule that are highly variable. These highly variable segments are called polymorphic sites. Each version of a polymorphic gene is called an allele. Forensic PCR DNA typing looks at a specific polymorphic site in the DNA molecule located on chromosome number six, which is known to code for the human leukocyte antigen system (HLA) and which has a large number of allelic variations.

It is the combination of the polymorphic nature of the HLA system and the natural replication process of the DNA molecule that provides the basis for PCR DQ Alpha DNA typing. See Spencer v. Com., 240 Va. 78, 393 S.E.2d 609 (1990).

Mihalovich went on to testify about how she received in her laboratory certain reference blood samples, which are those samples taken from a known person. In this case, she received samples from the victim and from the defendant, as well as from Harpster and Hicks. She also received oral, vaginal, and anal swabs of the victim, cuttings from a pair of underwear of the victim's, and a piece of blue denim that came from the victim's clothing.

The process by which Mihalovich processed the samples, including the reference samples, was then described. In this process, the sperm cells were separated from the remainder of the samples. From the reference samples, the victim's DQ Alpha type was determined to be type 1.2,1.2; the defendant's was found to be 4,4. The sperm found on the victim's blue jeans and the anal swab taken from the victim was DQ Alpha type [246 Neb. 970] 4,4, which, Mihalovich testified, was consistent with the known reference sample of the defendant. Reference samples from the two friends of the defendant's, Hicks and Harpster, were found to be type 1.1,3 and 2,3, respectively. That result, Mihalovich testified, would eliminate both of them as

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potential sources of the sperm found on the victim and her clothing. She continued to testify that comparing the DQ Alpha type 4,4 found in the stain on the victim's blue jeans and the defendant's reference blood, DQ Alpha type 4,4, the defendant could not be eliminated as a potential contributor of the sperm in the sample. As is apparent, PCR DQ Alpha DNA typing presumes only to determine that as a result of testing, the suspect either can be eliminated as the perpetrator or cannot be eliminated, as opposed to the more exact identifications which are possible by the RFLP DNA technique.

Mihalovich then testified that as she had previously explained, there are six DQ Alpha alleles, giving rise to 21 possible types within the population. Because there are more than 21 people in the world, more than one person can have the same DQ Alpha type. She then explained that there were statistics regarding known observations of DQ Alpha types in certain segments of the population based on data collected by Dr. Henry Erlich's laboratory, now at

Roche Molecular System. There are other published papers that had collected these statistics, Mihalovich said. She testified that she did not have a degree in population genetics. She then explained how she had used data published in a scientific paper: R. Helmuth et al., HLA DQ Alpha Allele and Genotype Frequencies in Various Human Populations, Determined by Using Enzymatic Amplification and Oligonucleotide Probes, 47 Am.J.Hum. Genetics 515 (1990). She then stated that from an examination of these statistics, she determined that DQ Alpha type 4,4 occurs in approximately 8.9 percent of the black population and approximately 6.8 percent of the white population. She then explained that in using the Hardy-Weinberg equilibrium equation, see State v. Houser, 241 Neb. 525, 490 N.W.2d 168 (1992), she determined that approximately 10 percent of the black population and 7 percent of the white population would have a 4,4 DQ Alpha type. Finally, using Statistical Abstract of [246 Neb. 971] the United States 1991, she determined as a weighted average that DQ Alpha type 4,4 occurs in an average of about 7.6 percent of the population in the United States, 6.9 percent in Nebraska, and 7.3 percent in Omaha.

It was upon this record that the trial court submitted the issue as to the identity of the defendant as the perpetrator of the crime, and this record which the defendant claims discloses prejudicial error requiring a reversal.

METHOD OF CALCULATING STATISTICAL PROBABILITY

In order to make a statistical evaluation of a declared match, it is necessary to know how frequently a genotype occurs in the relevant reference population. This process is determined according to population genetics principles as previously stated.

Mihalovich agreed that there were statistics regarding known observations of DQ Alpha type "in segments of the population and in certain segments of the population that are used to make that analysis." Those statistics come from a wide variety of sources, including FSA's collection of data made over a period of years, Dr. Erlich's laboratory, and other sources not confined to the forensics field.

Once the numbers are compiled, a statistical analysis is done to determine the percentage of the population that would have a particular DQ Alpha type. That is done for all 21 types. In doing that analysis, one method is the actual counting method, whereby one actually counts the number of people that have the particular type and/or the data are gathered from a number of people and counted as to how many times a particular type occurs within that population size. The other method is to calculate what the expected type would be using the formula referred to as the Hardy-Weinberg equation. Although Mihalovich is not a qualified population geneticist, she was permitted to give this testimony.

It is with this generalized testimony on the method of calculation of the statistical probability data in mind that we examine the

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defendant's contention that PCR DNA evidence was improperly admitted. However, to address this issue and those which follow, it is necessary to discuss the proper [246 Neb. 972] evidentiary standard for determining the admissibility of PCR DQ Alpha test results, as this testing presents new scientific evidence.

LEGAL STANDARD FOR DETERMINING THE ADMISSIBILITY OF DNA EVIDENCE

The defendant contends that the appropriate legal standard is the test articulated by this court in State v. Houser, 241 Neb. 525, 490 N.W.2d 168 (1992), a case decided after the preliminary hearing but before the trial in the present case. In Houser, we instructed that the trial court must preliminarily decide, outside the presence of a jury, if certain foundational requirements were satisfied before DNA evidence could be admitted.

The State argues that Houser does not apply in the present case and offers two bases for the argument. One, the State argues that since the Houser opinion dealt with preliminary hearing guidelines and was decided after the trial court held a preliminary hearing regarding the admissibility of the DNA evidence, the trial court could not have erred in not following these guidelines, and therefore, the subsequent change in law regarding evidentiary determinations had no effect. Two, the State asserts the test set forth in Houser may be inapplicable because subsequent to this court's opinion in Houser, the U.S. Supreme Court, in Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993), ruled that the Frye "general acceptance" test, the foundation of the Houser test, was superseded by the Federal Rules of Evidence, and is not a necessary precondition to the admissibility of scientific evidence. The State's arguments on this issue are inherently inconsistent and illustrate the necessity of stating the effect of a subsequent change in law.

When there has been a subsequent change in the law, it is the duty of the trial court to render a decision which reflects any change in the applicable law which occurred in the interval between the time the judge made rulings of law and the time judgment is pronounced. See Happy Hour, Inc. v. Nebraska Liquor Control Commission, 186 Neb. 533, 184 N.W.2d 630 (1971) (a statutory amendment relating to a matter of [246 Neb. 973] procedure is applicable to pending cases which have not been tried). Since the trial court is bound by the existing statutory or case law, the fact that the court held a preliminary hearing does not eliminate the court's obligation to conform to existing law.

In the present case, the defendant objected at trial to the DNA evidence on the basis that the admissibility requirements did not conform to this court's ruling in Houser; therefore, the issue is preserved for appeal. The question now becomes whether the admissibility standard for DNA evidence is to be determined under Houser or Daubert.

Prior to the Supreme Court's ruling in Daubert, it was well established in Nebraska that the Frye test, as established in Frye v. United States, 293 F. 1013 (D.C.Cir.1923), was the appropriate test to use in determining the admissibility of novel scientific evidence. The court in Frye set out a "general acceptance" test for the admissibility of testimony about scientific evidence. The Frye court noted: "[W]hile courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs." 293 F. at 1014. As one court has commented, the "Frye court assumed that general acceptance indicated reliability and that only reliable evidence should be admissible." U.S. v. Jakobetz, 955 F.2d 786, 794 (2d Cir.1992), cert. denied 506 U.S. 834, 113 S.Ct. 104, 121 L.Ed.2d 63. One of the primary objectives of this test is to shield jurors from misleading or prejudicial scientific testimony. This rationale is based on the concern that (1) lay jurors tend to be overly impressed by science, (2) lay jurors lack the capacity to evaluate

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such scientific evidence critically, and (3) lay jurors are likely to give unreliable scientific testimony more weight than it deserves. Another benefit of Frye is protecting the courts from unproven and potentially erroneous scientific theories until those theories have been appropriately subjected to scrutiny by experts from the relevant scientific community.

In effect, Frye envisions an evolutionary process leading to the admissibility of scientific evidence. A novel technique must pass through an "experimental" stage in [246 Neb. 974] which it is scrutinized by the scientific community. Only after the technique has been tested successfully in this stage and has passed into the "demonstrable" stage will it receive judicial recognition.

Paul C. Giannelli, The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half-Century Later, 80 Colum.L.Rev. 1197, 1205 (1980).

The Frye test is not without critics. Many believe the test precludes the use of a new discovery or scientific technique even though there may be direct experimental or clinical support for the principle. A leading commentator writes that the objectives of the Frye test can be attained satisfactorily by less drastic constraints on the admissibility of scientific evidence. See 1 McCormick on Evidence § 203 (John W. Strong 4th ed. 1992).

In the 1993 decision in Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993), the Supreme Court rejected Frye's general acceptance test as the exclusive test and redefined the standard for the admission of expert testimony in the federal courts. The Supreme Court determined that the Frye test was superseded by Fed.R.Evid. 702. Rule 702 allows the admission of expert testimony if the scientific or specialized knowledge will assist the trier of fact and if the witness is properly qualified as an expert. The rule specifically states:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

The Court explained that "a rigid 'general acceptance' requirement would be at odds with the 'liberal thrust' of the Federal Rules and their 'general approach of relaxing the traditional barriers to "opinion" testimony.' " 509 U.S. at ----, 113 S.Ct. at 2794 (quoting Beech Aircraft Corp. v. Rainey, 488 U.S. 153, 109 S.Ct. 439, 102 L.Ed.2d 445 (1988)).

Daubert, by its own terms, does not apply to state court proceedings; nevertheless, the State argues that the Daubert holding is persuasive in Nebraska based on the fact that our rules of evidence mirror the federal rules. Nebraska codified the [246 Neb. 975] Federal Rules of Evidence effective August 24, 1975. Since the adoption of the federal rules, we have reaffirmed the Frye test as the appropriate legal standard in determining whether to admit new scientific evidence. See, State v. Houser, 241 Neb. 525, 490 N.W.2d 168 (1992); State v. Reynolds, 235 Neb. 662, 457 N.W.2d 405 (1990).

In our consideration of whether to adopt the Daubert standard, we have acknowledged the problems involved in the application of Frye, such as identifying the relevant scientific community and the ambiguity about what constitutes "general acceptance"; however, we also recognized that in application, Daubert leaves many similar questions unanswered. In refusing to apply Daubert in determining the admissibility of DNA evidence, the Arizona Supreme Court reasoned:

Daubert itself does not establish a regime based solely on the qualification of experts and relevance. See Fed.R.Evid. 702. The Daubert analysis includes a reliability requirement for "[p]ertinent evidence based on scientifically valid principles." ... The nature of this requirement is currently unknown, may vary from case to case, and is to be fashioned by trial judges using an analytical framework as yet unspecified.

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(Citation omitted.) State v. Bible, 175 Ariz. 549, 580, 858 P.2d 1152, 1183 (1993).

Many jurisdictions which have considered this issue have also refused to abandon the Frye standard and will not admit scientific evidence which is still the subject of dispute and controversy in the relevant scientific communities. See, State v. Cauthron, 120 Wash.2d 879, 846 P.2d 502 (1993); Fishback v. People, 851 P.2d 884 (Colo.1993); State v. Vandebogart, 136 N.H. 365, 616 A.2d 483 (1992). This caution is warranted in light of the fact that scientific evidence is becoming increasingly more prevalent and prominent in criminal court proceedings.

As one commentator noted, " 'legal proof of criminal conduct is rapidly evolving into a multidisciplinary mosaic of law, science, and technology.' " Andre A. Moenssens, Foreword: Novel Scientific Evidence in Criminal Cases: Some Words of Caution, 84 J.Crim.L. & Criminology 1 (1993). Since it is not possible for the courts to ignore these advances, [246 Neb. 976] scientific evidence becomes " 'a source of particular judicial caution.' " State v. Bible, 175 Ariz. at 578, 858 P.2d at 1181. A New Mexico court, when faced with this issue, declined to adopt the more lenient relevancy standard of Daubert and reaffirmed the Frye standard, stating:

If a scientific principle has gained general acceptance in the scientific community, there is some assurance that the jury will not embroil itself in the question of the validity of the principle. Further, the jury's inclination to be awed by the principle will not be as problematic if scientists generally accept it.

In effect, then, the Frye process endorses the soundness of the scientific principle that is at the root of the evidence, and the jury is not required to pass on the scientific reliability of the process involved.

State v. Anderson, 115 N.M. 433, 853 P.2d 135, 138 (N.M.App.1993). See, also, State v. Bible, 175 Ariz. at 578, 858 P.2d at 1181 (applying the Frye test: "[B]ecause neither judge nor jury may be able to separate 'junk science' from good science, Frye helps guarantee 'that reliability will be assessed by those in the best position to do so: members of the relevant scientific field who can dispassionately study and test the new theory' "); Fishback v. People, 851 P.2d at 890 (DNA testing "is precisely the sort of scientific evidence which requires application of the Frye test"); U.S. v. Porter, 618 A.2d 629, 633 (D.C.1992) (admissibility of DNA evidence "presents the very kind of issue which the ... language from Frye was designed to address").

In ensuring that only accepted, accurate DNA tests are considered as evidence in trials, we reaffirmed Frye as the appropriate test in State v. Houser, 241 Neb. 525, 490 N.W.2d 168 (1992), and further instructed that Frye was not totally controlling as to the admissibility of DNA evidence, but is only the first of several criteria that a trial court determines are satisfied before such testimony may be admitted.

In the present case, as in Houser, we recognize the complex nature of DNA evidence and the need to protect against unproven and potentially erroneous and misleading evidence, and we decline to adopt the less demanding Daubert standard and reaffirm Frye as the standard for determining the [246 Neb. 977] admissibility of DNA evidence.

In Houser, we held that even though the DNA method at issue may satisfy Frye as being generally accepted as reliable in the general sense, the forensic applications must also be sufficiently reliable. We instructed that the trial court is to decide preliminarily, outside the presence of the jury, on the basis of the evidence before it: (1) whether the witnesses on the DNA issue are experts in the relevant scientific fields, (2) whether DNA testing used in the case under consideration is generally accepted by the relevant scientific communities, (3) whether the method of testing used in the case under consideration is generally accepted as reliable if performed properly, (4) whether the test conducted properly followed the method, (5) whether PCR DNA analysis evidence is more probative than prejudicial under § 27-403,

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and (6) whether statistical probability evidence interpreting PCR analysis results is more probative than prejudicial. See State v. Houser, 241 Neb. 525, 490 N.W.2d 168 (1992) (applying same standard to RFLP DNA evidence).

Such a procedure was followed here. However, because we determine that FSA's statistical evidence and analysis were flawed and base our decision to reverse on that determination, we can assume without deciding that the methodology and procedure employed by FSA in arriving at a preliminary match were performed by an expert in the field, that the testing done was generally accepted in the scientific community, and that proper protocol was followed, thereby meeting the standards of the Frye test. We therefore move on to the statistical analysis.

It is the statistical step in the DNA analysis that is at the heart of this appeal and has been the primary focus of judicial inquiry in recent appellate cases. There is no disagreement that the Hardy-Weinberg principle upon which FSA's probability calculations are based is theoretically sound. See State v. Houser, supra. However, as the Washington Supreme Court noted: " '[T]here seems to be a serious misperception that Hardy-Weinberg equilibrium is a law of physics that must apply to a population.' ... The [proponent of DNA evidence] must show more than the theory. For the evidence to be admitted, the [principle] must be valid in application." (Citation omitted.) [246 Neb. 978] State v. Cauthron, 120 Wash.2d 879, 904, 846 P.2d 502, 514-15 (1993).

It is the question of whether the Hardy-Weinberg equation is valid as applied to population frequency estimates that is at the center of a current dispute within the scientific community. As we previously discussed, in order to calculate the statistical significance of a DNA match, it is necessary to know how frequently in the population an allele will be found. The probability estimate is determined by multiplying the product of the frequencies of the two alleles by two. Although this calculation appears relatively simple, this methodology is under considerable attack by the scientific community. The court in People v. Pizarro, 10 Cal.App.4th 57, 12 Cal.Rptr.2d 436, 452 (1992), effectively and efficiently summarized the basis of the current dispute in the scientific community:

In order to calculate the statistical significance of the match within a particular racial or ethnic population, tests are performed to determine the frequency of appearance of the different [alleles] within the target population. Thus, a database would be created by selecting a number of people from the relevant population which would be, theoretically, the same population to which the suspect belonged. Therefore, if the suspect was Hispanic then the Hispanic database would be employed to establish a frequency of occurrence of a given [genotype] within the Hispanic population. The underlying theory behind all of this is that the ratio of [genotypes] will vary among different racial and ethnic groups. In other words, while a [genotype] may not be distinct to particular racial or ethnic groups, it may occur with different frequency within different racial or ethnic groups....

It is around this theory that controversy rages. A database created from the general population would show the frequency of occurrence of a given defendant's specific [genotype] compared to the perpetrator without regard to race or ethnic background.... [T]he dispute revolves around the question of whether or not a racial or ethnic population group chosen to represent the database accurately reflects the group within which the suspect [246 Neb. 979] should be placed. The literature reflects that a number of prominent scientific figures conclude that selection of the database for a specific ethnic/racial group (the Black population or the Hispanic population, etc.) fails to consider the concept of subgrouping. Generally speaking, the selection of a database from a general population group (Black) as opposed to a subgroup (Blacks of Nigerian descent, for illustration purposes) is predicated on a concept of random

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mating within the general group without regard to the religion, ethnicity and geography. This process of random mating in general would conclude that the specific population is in ... equilibrium. The concept of subgrouping assumes that within each ethnic/racial population group there are subgroups that tend to mate within the specific subgroup (mating endogamously) based upon such factors as religion or like ethnicity or geographical differences, etc. Subgrouping would assume that based upon actual mating practices, as opposed to general mating practices, genetic differences would develop between subgroups. Therefore, subgroups (Puerto Rican Hispanics, for example) within a general population (Hispanic, for example) would show significant differences in the frequency of a given allele pattern....

The data used to create the data base in the present case apparently came from an article published in the American Journal of Human Genetics, an HLA workshop, and FSA case work. Thomas Blake, a forensic serologist employed by FSA, testified that numerous data bases exist and that once a determination is made that the data bases have basically the same frequencies, the data from all the different studies can be combined. He stated, "assuming a random mating population," the Hardy-Weinberg equation can be used to check the reliability of the data base.

When asked about the possibility of population substructure, Blake testified that population substructure was rare and not occurring in the population as a whole. When asked if there was a dispute in the scientific community concerning population substructure, Blake stated, "The theory [246 Neb. 980] of population substructure, there's some scientists who agree and some who don't. Nobody really disagrees that there's such a thing as substructure. There certainly is. The question is whether or not in the broad Caucasian population within the United States there are inbreeding isolates."

The State contends that any controversy concerning the statistical probabilities of a declared DNA match concerns credibility and weight, not admissibility. Although in Houser, we discussed statistical issues, we did not specifically address whether the admissibility of DNA statistical evidence requires that the probability calculations

be based on generally accepted methods. Therefore, the issue now before this court is whether the Frye- Houser requirement of general scientific acceptance applies to the statistical probability calculation step of DNA analysis.

In People v. Barney, 8 Cal.App.4th 798, 10 Cal.Rptr.2d 731 (1992), a California court recently examined this issue. In applying standards essentially identical to Frye- Houser, the court reasoned:

To end the Kelly- Frye inquiry at the matching step, and leave it to jurors to assess the current scientific debate on statistical calculation as a matter of weight rather than admissibility, would stand Kelly- Frye on its head. We would be asking jurors to do what judges carefully avoid--decide the substantive merits of competing scientific opinion as to the reliability of the novel method of scientific proof. We cannot reasonably ask the average juror to decide such arcane questions as whether genetic substructuring ... preclude[s] use of the Hardy-Weinberg equation ... when we ourselves have struggled to grasp these concepts. The result would be predictable. The jury would simply skip to the bottom line--the only aspect of the process that is readily understood--and look at the ultimate expression of match probability, without competently assessing the reliability of the process by which the laboratory got to the bottom line. This is an instance in which the method of scientific proof is so impenetrable that it would " '... assume a posture of mystic infallibility in the eyes of a jury....' ..." ... It is [246 Neb. 981] the task of scientists--not judges, and not jurors--to assess reliability. " 'The requirement of general acceptance in the scientific community assures that those most qualified to assess the general validity of a scientific method will have the determinative voice....' " ...

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Might the statistical calculation step be distinguished from the processing and matching steps for Kelly- Frye purposes on the ground that only the first two steps produce novel scientific evidence while the third step is merely interpretative? Again, such an approach would subvert Kelly- Frye. The evidence produced by DNA analysis is not merely ... raw data ... but encompasses the ultimate expression of the statistical significance of a match, in the same way that polygraph evidence is not merely the raw data produced by a polygraph machine but encompasses the operator's ultimate expression of opinion whether the subject is telling the truth. Were we to terminate the Kelly-Frye inquiry short of the interpretative steps in new methods of scientific proof, Kelly- Frye would lose much of its efficacy as a tool of "considerable judicial caution" and of an "essentially conservative nature" that is "deliberately intended to interpose a substantial obstacle to the unrestrained admission of evidence based upon new scientific principles."

(Citations omitted.) (Emphasis omitted.) 10 Cal.Rptr.2d at 742. Accord State v. Anderson, 115 N.M. 433, 853 P.2d 135 (N.M.App.1993).

We agree. The calculation of statistical probability is an essential part of the process used in determining the significance of a DNA match; therefore, the underlying method of arriving at that calculation must also meet the Frye- Houser general acceptance test. Based on this conclusion, the task before this court is not to decide the underlying validity of the methods employed in calculating population frequencies--whether or not Hardy-Weinberg equations are invalid due to population substructure--rather, we must determine whether the methodology has gained general acceptance. The report of the Committee on DNA Technology [246 Neb. 982] in Forensic Science, National Research Council, DNA Technology in Forensic Science (1992), a part of the record in the Frye hearing held in this case, is persuasive regarding the lack of general acceptance. As stated in State v. Anderson, 853 P.2d at 145-46:

While this case was pending on appeal, a group of scholars that are part of the National Academy of Sciences released a prepublication manuscript of a report on DNA evidence. See Committee on DNA Technology in Forensic Science, National Research Council, DNA Technology in Forensic Science (forthcoming). The group of scholars included many highly regarded names in science, medicine, and law. The bulk of the report urges the continued development of DNA evidence for forensic use. However, the report does include some criticisms of current methods of DNA typing. Again, the authors focus on one of the main criticisms, the absence of reliable subpopulation databases. Id. at § 3.2. The report discusses the debates over the need for subpopulation databases, and concludes that they indeed are necessary. This report is indicative of the absence of general acceptance. There is not just one author trying to make a point, but rather a group of people that has reached a consensus in rejecting one aspect of the current methods of forensic use of DNA evidence.

Before the issuance of the DNA committee report, statistical estimates calculated by forensic laboratories were routinely ruled admissible in most cases; however, since the issuance, an overwhelming majority of courts have excluded evidence of a match after finding there is no general acceptance as to the statistical probability calculations due to the division in the scientific community on the issue of population substructure. See, State v. Vandebogart, 136 N.H. 365, 616 A.2d 483 (1992) (evidence of match was not admissible when not accompanied by scientifically reliable population frequency estimate); Commonwealth v. Lanigan, 413 Mass. 154, 162, 596 N.E.2d 311, 316 (1992) (court held there was no general acceptance in the field of population genetics when there exists a "lively,

and still very current, dispute" regarding the role of population [246 Neb. 983] substructure); People v. Mohit, 153 Misc.2d 22, 579 N.Y.S.2d 990, 998 (1992) (there is a "sharp disagreement within the scientific community on the

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manner in which probability estimates are derived").

The State contends that the following appellate court decisions are indicative of the general acceptance of PCR DQ Alpha methodology: Spencer v. Com., 240 Va. 78, 393 S.E.2d 609 (1990); Clarke v. State, 813 S.W.2d 654 (Tex.App.1991); State v. Williams, 252 N.J.Super. 369, 599 A.2d 960 (1991); State v. Lyons, 124 Or.App. 598, 863 P.2d 1303 (1993); and State v. Penton, No. 9-91-25, 1993 WL 102507 (Ohio App. Apr. 7, 1993) (unpublished opinion), dismissed 67 Ohio St.3d 1464, 619 N.E.2d 698. An examination of these cases reveals that the issues of population substructure and the reliability of population data bases were not addressed; therefore, these cases are not persuasive nor relevant as to validity of the statistical methodology employed by FSA. See, U.S. v. Chischilly, 30 F.3d 1144, 1157 (9th Cir.1994) ("[u]nderrepresentation of persons of like ethnicity in the profile data bases and questionable assumptions of allelic independence may inflate the odds against a random match with the defendant's sample. In such a situation the jury may be ill-suited to discount properly the probative value of DNA profiling statistics"); State v. Hummert, No. 1 CA-CR 92-098, 1994 WL 384979 at * 7 (Ariz.App. July 26, 1994) (" '[t]estimony of a match in DNA samples, without the statistical background or probability estimates, is neither based on a generally accepted scientific theory nor helpful to the trier of fact' ").

Given the substantial disagreement within the scientific community, this court finds there is no general acceptance of FSA's statistical probability calculations. This finding requires an additional inquiry into whether the absence of general acceptance of the statistical methodology results in the total exclusion of the evidence.

Two judicial approaches have emerged. One approach is to separate the evidence of a declared match from the statistical probability component of the DNA analysis. See, State v. Pennell, 584 A.2d 513 (Del.1989); State v. Schwartz, 447 [246 Neb. 984] N.W.2d 422 (Minn.1989). Under this approach, the jury is not allowed to hear evidence of the statistical significance of the match. The majority of courts have rejected this approach and have adopted the view expressed by the DNA committee. The DNA committee report states: "To say that two patterns match, without providing any scientifically valid estimate ... of the frequency with which such matches might occur by chance, is meaningless." DNA Technology in Forensic Science, supra at 3-1.

"Without the probability assessment, the jury does not know what to make of the fact that the patterns match: the jury does not know whether the patterns are as common as pictures with two eyes, or as unique as the Mona Lisa." U.S. v. Yee, 134 F.R.D. 161, 181 (N.D.Ohio 1991). The court in People v. Barney, 8 Cal.App.4th 798, 10 Cal.Rptr.2d 731 (1992), found that a declared DNA match means nothing without the statistical component. Similarly, the Washington Supreme Court found that "[t]estimony of a match in DNA samples, without the statistical background or probability estimates, is neither based on a generally accepted scientific theory nor helpful to the trier of fact." State v. Cauthron, 120 Wash.2d 879, 907, 846 P.2d 502, 516 (1993). See, also, State v. Anderson, 115 N.M. 433, 853 P.2d 135 (N.M.App.1993); State v. Vandebogart, supra; Commonwealth v. Curnin, 409 Mass. 218, 565 N.E.2d 440 (1991).

The majority approach is consistent with this court's opinion in State v. Houser, 241 Neb. 525, 490 N.W.2d 168 (1992). Therefore, we hold that evidence of a DNA match will not be admissible if it has not been accompanied by statistical probability evidence that has been calculated from a generally accepted method. Even though the trial court could not have anticipated the extent of the current dispute within the scientific community regarding population substructure, it was error to admit the DNA evidence. Whether this is harmless error, as the State contends, will be discussed infra.

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WHETHER PCR DNA ANALYSIS AND STATISTICAL EVIDENCE IS MORE PROBATIVE THAN PREJUDICIAL UNDER § 27-403

Although evidence may be relevant, § 27-403 provides that it [246 Neb. 985] may be excluded if the evidence is more prejudicial than probative. Having concluded that the statistical process is an integral component of DNA testing, we examine whether the PCR DQ Alpha analysis and statistical evidence are more probative than prejudicial. We begin by noting that unlike the RFLP typing system at issue in Houser, the PCR system's statistical probability results are not expressed in the exceptionally high numbers that essentially "fingerprint" the defendant. Similar to ABO blood typing, PCR results indicate that the defendant falls within a certain percentage of a reference population group with the same genotype as that detected in the evidence sample. Although at first glance, this result may appear rather innocuous, a more searching examination reveals an inherent problem associated with how the statistical probabilities are applied.

In People v. Pizarro, 10 Cal.App.4th 57, 12 Cal.Rptr.2d 436 (1992), the court noted that under circumstances where the racial or ethnic background of the suspect is unknown, relevancy issues may be raised regarding the use of racial and ethnic data bases. The court reasoned:

The disputed fact generally is whether the suspect is also the perpetrator. Thus, the evidence is relevant if it tends to prove the suspect is the perpetrator. However, the preliminary fact upon which the relevancy of the proffered evidence depends is the racial/ethnic background of the perpetrator, not the suspect. If the only way you can conclude the perpetrator fits a racial/ethnic category is to assume the perpetrator was the same race/ethnic background as the suspect then the reasoning is circular, i.e.: proof of the racial/ethnic background of the perpetrator depends on the racial/ethnic background of the suspect from which we infer a statistical probability that the perpetrator is the suspect. Absent proof ... to support the preliminary fact as to the racial/ethnic background of the perpetrator, we see no relevancy to a database selected because of the racial/ethnic background of the suspect/defendant. The problems created by employing assumed relevancy of the database are insidious. A jury hears [a statistical] figure that not [246 Neb. 986] uncommonly depends for its relevance upon the very issue that they have to decide: is the defendant the perpetrator?

12 Cal.Rptr.2d at 460.

The problems discussed by the Pizarro court are evident in the present case. Portions of the testimony of Blake, FSA's forensic serologist, at the preliminary hearing illustrate the problem and are set forth as follows:

Q. Okay. In your--now, let's talk specifically about your analysis of Asa Carter's case, all right? You talk about--your results indicate he is a 4,4?

A. Yes.

Q. And then make--draw some conclusions about what percentage of certain racial backgrounds have with--have a 4,4 present in their DQ Alpha, correct?

A. Well, that's an independent exercise, but that information was provided, yes.

Q. All right. First of all, my understanding from yesterday's testimony and from the depositions was that obviously you cannot tell the racial identity of an individual from the--well, specifically in this case, from any type of observation or analysis of the sperm, correct?

A. That is correct.

....

Q. With regard to--specifically with regard to the defendant, were you given information as to his racial background?

A. I think I had the understanding that he was black.

....

Q. Well, if Mr. Carter's racial background is, for instance, part black, part

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American Indian and part white, how does that affect your percentages, or does it?

A. It has absolutely no effect. Mr. Carter's particular racial background is totally irrelevant.

....

Q. Particularities of the racial makeup of the defendant have no bearing on whether he would or would not fit within a certain racial data base upon which you say eight percent or ten percent?

A. Not unless you have some independent information [246 Neb. 987] that the true assailant comes from a particular race. Again, the only point in giving you this information--as far as I know, nobody knows anything about the race of the assailant in this case.

So the purpose of giving you, as I did in my report, data for blacks and Caucasians is simply based upon the idea, maybe it reflects my own bias, that most people, in at least my community and, I assume, in this community, are either black or white. So you might want to know what is the extreme for the black population, which is the extreme for the Caucasian population? And that helps you answer how common this type is in the man walking down the street, somewhere between 8 and 11 percent.

Blake further testified that based on the combined data base used by FSA, the defendant's genotype (4,4) occurs in about 8 percent of the Caucasian population, slightly more than 10 percent of the black population, 16.5 percent of the Mexican-American population, and 13.7 percent of the Sioux Native American population. However, Blake's written report and the testimony of Mihalovich at trial referred to only the Caucasian and black statistical percentages.

As previously discussed and as Blake's testimony illustrates, all population groups share common PCR DQ Alpha genotypes. It is only the frequency with which these genotypes appear within the different racial or ethnic groups which varies. Since Blake concedes that an individual's race or ethnic background cannot be determined by

his or her genotype, the logic of presenting limited statistical frequencies when the racial or ethnic background of the perpetrator is unknown is flawed. There is nothing in this method that accounts for the possibility that the perpetrator was of another racial or ethnic group such as Hispanic, Native American, or Asian. It is apparent that the statistical frequency evidence the jury heard in the present case was based on the assumption that the perpetrator was either black or Caucasian. To limit the statistical frequency evidence to two racial groups when the racial or ethnic background of the perpetrator is unknown is prejudicial under any circumstances; however, in the present case it was particularly offensive in light of the fact the defendant is a black man and his Caucasian [246 Neb. 988] friends (Hicks and Harpster) were excluded as possible suspects by PCR DNA tests. See, also, State v. Anderson, 115 N.M. 433, 853 P.2d 135, 147 (N.M.App.1993) (court noted that the data base chosen depends on the ethnicity of the defendant and not necessarily the ethnicity of the perpetrator of the crime. It concluded that this method was misleading, because "[i]f, in fact, the crime was committed by someone of a different racial or ethnic database, then the appropriate subgroup, and thus the odds, would change, perhaps dramatically"); People v. Pizarro, 10 Cal.App.4th 57, 12 Cal.Rptr.2d 436, 459 (1992) (it is a "bootstrap argument" to assume relevancy of a data base simply because the suspect falls within that racial or ethnic group); R.C. Lewontin, Letter, Which Population?, 52 Am.J.Hum. Genetics 205 (1993) (the relevant question is not the ethnicity of the defendant).

Considering the nature of the statistical probability evidence admitted in this case, we determine whether it is more prejudicial than probative. The State concedes that the reasons the PCR DNA tests were offered were to (1) bolster the defendant's wife's testimony which identifies the defendant as the perpetrator and (2) to substantiate the theory that the victim was sexually

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assaulted. These reasons appear to have little probative value. The fact that the victim was sexually assaulted was clearly established and was not an issue in this case. Furthermore, the testimony of the defendant's wife was substantiated by strong circumstantial evidence. The limited probative value of the DNA evidence, in conjunction with the questionable use of the Negroid and Caucasian data bases in this case, renders the DNA evidence more prejudicial than probative.

HARMLESS ERROR

The question remains whether the error in admitting the DNA evidence absent compliance with Frye- Houser was harmless error. In a jury trial of a criminal case, whether an error in admitting or excluding evidence reaches a constitutional dimension or not, an erroneous evidential ruling results in prejudice to a defendant unless the State demonstrates that the error was harmless beyond a reasonable doubt. State v. [246 Neb. 989] Dyer, 245 Neb. 385, 513 N.W.2d 316 (1994); State v. Flores, 245 Neb. 179, 512 N.W.2d 128 (1994). An error is harmless when the improper admission did not materially influence the jury to reach a verdict adverse to the substantial rights of the defendant. State v. Hughes, 244 Neb. 810, 510 N.W.2d 33 (1993).

The U.S. Supreme Court, in Sullivan v. Louisiana, 508 U.S. 275, ----, 113 S.Ct. 2078, 2081, 124 L.Ed.2d 182 (1993), addressed the issue of harmless error and stated:

Harmless-error review looks ... to the basis on which "the jury actually rested its verdict." ... The inquiry, in other words, is not whether, in a trial that occurred without the error, a guilty verdict would surely have been rendered, but whether the guilty verdict actually rendered in this trial was surely unattributable to the error.

(Emphasis omitted.) (Citation omitted.)

Therefore, it is harmless error only if the appellate court is convinced beyond a reasonable doubt that the erroneous admission of DNA evidence could have had no influence on the jury's judgment.

We begin our analysis by noting that this case is atypical in that the defendant did not present any DNA expert to contest or question the procedures or findings of the prosecution's DNA witnesses. In nearly all the reported cases involving DNA, the trier of fact and the appellate court have been provided with the testimony of at least several expert witnesses, both in support of and in opposition to the admission of the DNA evidence. See, e.g., State v. Cauthron, 120 Wash.2d 879, 846 P.2d 502 (1993); State v. Vandebogart, 136 N.H. 365, 616 A.2d 483 (1992); U.S. v. Yee, 134 F.R.D. 161 (N.D.Ohio 1991).

The State presented strong circumstantial evidence against the defendant. However, in State v. Houser, 241 Neb. 525, 546, 490 N.W.2d 168, 182 (1992), we held that even though other evidence was sufficient to support the defendant's conviction, the error in admitting the DNA evidence was not harmless because jurors could be unduly influenced by DNA evidence. The Mississippi Supreme Court, in Polk v. State, 612 So.2d 381, 393 (Miss.1992), recognized the potency of DNA evidence with regard to its possible effect on jurors, saying, "Because of [246 Neb. 990] the potential for jurors to rely solely on the evidence provided by DNA to the exclusion of other evidence, it is important...."

The erroneous admission of DNA evidence cannot be said to be harmless error given the highly prejudicial nature of DNA evidence and the unusual circumstances of this case. See State v. Houser, supra.

The judgment of the district court is reversed and the cause remanded for a new trial.

REVERSED AND REMANDED FOR A NEW TRIAL.

WRIGHT, Justice, dissenting.

I respectfully dissent from the decision of the majority, which grants Asa T. Carter a

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new trial. The following is a brief summary of the evidence upon which the conviction was obtained: On October 20, 1990, the victim, a 9-year-old girl, was found dead in an area immediately to the rear of the apartment house in Omaha in which Carter resided. Carter's wife testified that the victim arrived to stay overnight at the Carters' home on the evening of October 19. During the evening, Carter, Lanny Hicks, and David Harpster periodically came and went from the apartment. At no time did Hicks or Harpster have any contact with the victim, and eventually they left.

At 4:15 a.m. on October 20, Carter entered the bedroom, became sexually aroused, and told his wife he wanted to "make love" to her, but then told his wife he wanted to make love to the victim, who was sleeping in the same bed. Carter told his wife that if she loved or cared about him, she would let him make love to the victim, so his wife left the apartment.

When Carter's wife returned approximately 40 minutes later, she found the victim lying naked faceup on the bed, with no pulse. Carter told his wife, "I didn't mess with her." He then threatened his wife, told her she must "stick by his side" or the "same thing could happen to [her]," and indicated that "if he [went] down," he would take her "down with him." Carter then dressed the victim, removed the body from the apartment, and put the bedsheets into the bathtub.

Medical evidence established that the victim had been subjected to anal and vaginal penetration and that the cause of death was asphyxiation, most likely caused by compression of [246 Neb. 991] her chest by the perpetrator of the sexual assault. Semen was present in the crotch and back area of the victim's underwear and on an anal swab taken from the victim. Human blood was found on vaginal and anal swabs, a washcloth, a towel, a shirt, bedsheets, and Carter's jacket pocket.

As I understand it, the testing conducted in this case, polymerase chain reaction DNA amplification (PCR DQ Alpha DNA) typing, had two separate components. First, semen taken from the anal swab was tested for the presence or absence of certain PCR genotypes, and similar tests for PCR genotypes were completed on samples taken from the victim, Carter, Hicks, and Harpster. The results were compared directly. Without any statistical analysis whatsoever, the lack of certain PCR genotypes eliminated Hicks and Harpster as possible donors of the semen. Conversely, Carter could not be eliminated because of the presence of certain PCR genotypes. The majority concedes that the methodology up to this point meets the Frye- Houser standard.

The second step in the PCR analysis becomes significant. That step is the statistical analysis of the raw data from the tests. The majority holds that this statistical analysis of the raw data, the statistical analysis which identified Carter as a possible donor of the semen, did not meet the Frye- Houser standard. The majority places emphasis on the statistical calculation which ties Carter to the donor of the semen. Because the majority believes the calculation of statistical probability is an essential part of the process used to determine the significance of a DNA match, it concludes that inclusion of the DNA tests in evidence was prejudicially erroneous.

In my opinion, statistical probability evidence is not required for the admission of the PCR test in this case. Restriction fragment length polymorphism (RFLP) DNA analysis, which was used in State v. Houser, 241 Neb. 525, 490 N.W.2d 168 (1992), declares a specific "fingerprint" match. The PCR test used in this case does not identify the donor, but merely determines whether a particular person can be eliminated as a donor. Whether or not statistical evidence is later used to correlate the exclusions established by the test to particular population groups, the exclusions made by the test stand--they [246 Neb. 992] are independent of the statistical analysis.

If Carter had been an unknown suspect in a general population, the statistical correlation would have been critical in identifying him as a possible donor of the semen. Logically, in a case involving an unknown number

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of suspects, evidence of the number of people who had similar DNA patterns and the possible frequency of such similar DNA patterns among samples taken from a given population would be extremely important in identifying the perpetrator. However, Carter's identity as the probable perpetrator was established by the testimony of his wife, which placed him in bed with the victim and sexually aroused no more than 40 minutes before the victim's death.

Disregarding statistical analysis, the PCR test tended to show no more and no less than the fact that Carter could not be ruled out. In other words, the PCR test showed that it was not impossible for Carter to be the donor.

The testimony of Carter's wife established a particular chain of events. When Carter's wife left the apartment, the victim was alive and healthy. Forty minutes later, the victim had been sexually assaulted anally and vaginally and had died from suffocation. Carter told his wife he was going to sexually assault the victim, and when his wife returned, Carter threatened that harm would come to her if she did not remain silent about the death. He then disposed of the body and attempted to destroy other evidence. The raw data from the PCR test showed that this chain of events was not scientifically impossible.

In addition to the testimony of Carter's wife, the jury heard testimony from Carter's two daughters from a previous marriage and his half sister, who testified that they had been sexually assaulted by Carter when they were between the ages of 6 and 11. The testimony established that Carter had a history of sexually assaulting young girls.

Even assuming that the statistical probability evidence in this case was erroneously admitted, it can be said beyond a reasonable doubt that its admission was harmless. It is the duty of a reviewing court to consider the trial record as a whole and to ignore errors that are harmless. State v. Timmerman, 240 Neb. 74, 480 N.W.2d 411 (1992). In the trial of a criminal case, [246 Neb. 993] erroneous admission of evidence which is not cumulative may constitute harmless error beyond a reasonable doubt, when a defendant's conviction is supported by overwhelming evidence which has been properly admitted or admitted without objection. State v. Nielsen, 243 Neb. 202, 498 N.W.2d 527 (1993). An error is harmless when the improper admission of evidence did not materially influence the jury to reach a verdict adverse to the substantial rights of the defendant. State v. Hughes, 244 Neb. 810, 510 N.W.2d 33 (1993). It may be said beyond a reasonable doubt that the jury did not rest its verdict upon evidence that Carter's genotype was found in 7 percent of the white population and 10 percent of the black population.

There were three male suspects who had access to the victim. Two of those three were eliminated without the use of statistical analysis. Where there is a known group of three possibilities and two are eliminated, statistical probabilities concerning the third possibility are unnecessary. The evidence of Carter's guilt is overwhelming. I cannot say that the statistical probability evidence regarding the DNA pattern materially influenced the jury. I would affirm the conviction.

HASTINGS, C.J., joins in this dissent.