

STATE OF MICHIGAN  
COURT OF APPEALS

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PEOPLE OF THE STATE OF MICHIGAN,

Plaintiff-Appellee,

v

LAURENCE DEANE COY II,

Defendant-Appellant.

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FOR PUBLICATION

November 17, 2000

9:00 a.m.

No. 217707

Calhoun Circuit Court

LC No. 98-001925 FC

Before: Talbot, P.J., and Hood and Gage, JJ.

GAGE, J.

Defendant was charged with open murder. MCL 750.316; MSA 28.548. After a jury trial, defendant was convicted of second-degree murder, MCL 750.317; MSA 28.549. The trial court sentenced defendant as a third habitual offender,<sup>1</sup> MCL 769.11; MSA 28.1083, to forty to sixty years' imprisonment. Defendant appeals as of right. We reverse and remand.

I

The victim and her young son shared a Battle Creek apartment with Kristina McKee and her two sons. Between 3:00 and 3:30 a.m. on January 5, 1998, McKee returned home from work and discovered the victim's body lying on the victim's blood stained bedroom floor. An autopsy revealed that the victim had suffered 25 to 30 stab wounds, including slashes to her head, face, neck, torso, hands and arms, and four deep and parallel blade penetrations through her back and lung. The victim also had two black eyes and more bruising near her chin and left arm. Police found inside the victim's bedroom some blood on the bedroom door and doorknob, the victim's blood stained bedding, a bloody pen on the floor near the victim, and a broken, bloody steak knife blade. Police detected no indication that anyone broke into the victim's apartment.

The police investigated several possible suspects. Defendant became a suspect because prior to the murder, he and the victim occasionally engaged in sexual intercourse, and defendant

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<sup>1</sup> In support of this requested enhancement the prosecutor's complaint cited defendant's October 1995 conviction of attempted carrying of a concealed weapon and February 1997 conviction of carrying a concealed weapon, MCL 750.227; MSA 28.424.

visited the apartment several times each week. The police also discovered after the murder that defendant possessed cuts on his right hand that required emergency room treatment. Subsequent laboratory testing revealed that the deoxyribonucleic acid (DNA) properties contained within sperm cells removed from the victim's body appeared to match defendant's DNA profile.<sup>2</sup> The prosecutor also introduced evidence that defendant's DNA profile was consistent with a mixed blood sample detected on the broken knife blade and the victim's bedroom doorknob. Despite defendant's presentation of several alibi witnesses, the jury, after deliberating on several, separate days and requesting and obtaining review of the testimony of the prosecutor's DNA expert witness, found defendant guilty of second degree murder.

## II

### A

Defendant first contends that the prosecutor improperly solicited testimony from the DNA expert witness regarding the possible presence of defendant's blood on the broken knife blade and doorknob without offering any accompanying statistical evidence that clarified the significance of the possible DNA match. Defendant's contention raises an evidentiary issue, which issue the prosecutor initially labels unpreserved given defendant's failure to object before the trial court to the challenged testimony. We agree that defendant failed to properly preserve this evidentiary question. While defendant at a July 13, 1998 pretrial hearing moved to quash the information on the basis that the district court in binding over defendant considered meaningless and inadmissible DNA evidence absent some accompanying and interpretive statistical analysis,<sup>3</sup> defendant did not timely object at trial to the DNA expert's testimony. MRE 103(a)(1); *People v Furman*, 158 Mich App 302, 329-330; 404 NW2d 246 (1987).

"Mere forfeiture, [however], does not extinguish an 'error.'" *People v Carter*, 462 Mich 206, 215; 612 NW2d 144 (2000). An appellate court properly may review forfeited claims of error when the forfeited claim involves a plain error affecting the defendant's substantial rights. *People v Carines*, 460 Mich 750, 763-764; 597 NW2d 130 (1999) (explaining that the plain error rule applies to unpreserved constitutional and nonconstitutional claims of error); *People v Grant*, 445 Mich 535, 547-549, 552-553; 520 NW2d 123 (1994). Accordingly, we will first review defendant's contention to determine whether the admission of the challenged DNA testimony constituted plain error. We note that the available record affords us an ample basis for reviewing defendant's contention.<sup>4</sup> See *People v Mayfield*, 221 Mich App 656, 660; 562 NW2d 272 (1997)

<sup>2</sup> The prosecutor's DNA expert testified that the likelihood that the sperm DNA belonged to an African-American individual other than defendant was one in 543 million.

<sup>3</sup> The trial court did not consider the merits of defendant's position regarding the DNA evidence's admissibility, finding that "while the [District] Judge did, in fact point to the DNA evidence, there was a great deal of more evidence that he relied on, and it was not an abuse of discretion . . . in binding this Defendant over for trial."

<sup>4</sup> After filing the instant claim of appeal, defendant moved for a remand. Defendant explained that despite his contention in his brief on appeal that he adequately preserved the DNA evidence admissibility issue through defense counsel's objections at the preliminary examination and in the motion to quash, the potential existed that this Court would find that defense counsel's failure

(continued...)

("The purpose of appellate preservation requirements is to induce litigants to do what they can in the trial court . . . to create a record of the error and its prejudice.").

B

Because an understanding of DNA's character and function enhances an understanding of the nature of the instant evidentiary issue, we provide the following brief and general background:

Each human body contains an enormous number of cells, all descended by successive divisions from a single fertilized egg. The genetic material, DNA, is in the form of microscopic *chromosomes*, located in the inner part of the cell, the *nucleus*. A fertilized egg has 23 pairs of chromosomes, one member of each pair having come from the mother and the other from the father. . . . Before cell division, each chromosome splits into two. . . . [E]ach daughter cell receives identical chromosomes, duplicates of the 46 in the parent cell. Thus, each cell in the body should have the same chromosome makeup. This means that cells from various tissues, such as blood, hair, skin, and semen, have the same DNA content and therefore provide the same forensic information. [National Research Council, *The Evaluation of Forensic DNA Evidence* (1996), p 12.]

Genes direct the various traits of each human being by controlling the differentiation of the billions of cells in each individual's body. Together, the total genetic information contained in a person's genes comprises a *genome*, a unique genetic blueprint for each person. . . . A person's entire genome can be found inside each cell in the same central location. . . . [LeRoy Walters & Julie Gage Palmer, *The Ethics of Human Gene Therapy* (1997), p 4.]

\* \* \*

Genes are comprised of deoxyribonucleic acid (DNA). DNA is a molecule that consists of two intertwined strands, wrapped around each other in helical fashion, like the stripes of a barbershop pole. Accordingly, when James Watson and Francis Crick discovered DNA's structure in 1953, they called it a *double helix*. [*Id.* at 5]

This Court previously characterized the double helix somewhat differently, as

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to specifically object at trial to the evidence's admission precluded substantive review of the issue. According to defendant, absent this Court's substantive review of the challenged DNA evidence, defendant would have been denied his right to effective assistance of trial counsel. Defendant therefore requested a remand for an evidentiary hearing pursuant to *People v Ginther*, 390 Mich 436, 443-444; 212 NW2d 922 (1973). This Court denied defendant's motion to remand, however, "because defendant . . . has failed to demonstrate by affidavit or offer of proof that development of a factual record is required before this issue can be decided by this Court."

a twisted ladder. Phosphate and deoxyribose sugar form the rails of the ladder. Four chemical bases—Adenine (A), Cytosine (C), Guanine (G), and Thymine (T)—lie next to each other on the sugar links along the sides of the ladder. Each A always bonds with a T on the other side of the ladder, and each C always bonds with a G on the other side of the ladder, so that the possible base pairs on the ladder are A-T, T-A, C-G, and G-C. The base pairs are connected by a hydrogen bond, such that the bonds form the rungs of the ladder. There are approximately three billion base pairs in one DNA molecule. Although no two human beings have the same sequence of base pairs (except for identical twins), we share many sequences that create common characteristics such as arms, legs, fingers, and toes. The sequences of variation from person to person are known as polymorphisms. They contain different alleles, which are alternate forms of a gene capable of occupying a single location on a chromosome. Polymorphisms are the key to DNA identification because they create the individual characteristics of everyone and are detectable in laboratory testing. [*People v Adams*, 195 Mich App 267, 270; 489 NW2d 192 (1992), modified on other grounds 441 Mich 916; 497 NW2d 182 (1993).]

Although all genes are made of DNA, not all DNA makes up genes. The bases are strung along in varying order along the double helix, sometimes constituting genetic information and sometimes not. . . .

Only a small fraction (between 1/20<sup>th</sup> and 1/35<sup>th</sup>) of the 3 billion base pairs of human DNA represents genes. Researchers estimate that there are between 50,000 and 100,000 human genes. [Walters & Palmer, *supra* at 5.]

"The position that a gene occupies along the DNA thread is its locus." National Research Council, *supra* at 13. "In forensic work, the genotype for the group of analyzed loci is called the DNA profile." *Id.* at 14.

### C

In this case, a laboratory utilized the polymerase chain reaction (PCR) method of analyzing the DNA recovered from the sperm samples; the broken, bloody knife blade; the pen; hairs found on the victim's body; the bloody bedroom doorknob; and the victim's and defendant's blood samples.

The PCR method is, simply put, a procedure to replicate repeatedly part of the DNA of a cell so that millions of copies of a particular gene are eventually produced in order to analyze the DNA.

The steps used in the PCR process involve some of the same steps used in the RFLP [restriction fragment length polymorphisms] method.<sup>5</sup> First, the DNA

<sup>5</sup> For a thorough discussion regarding the RFLP testing method, see *Adams, supra* at 270-272.

must be purified. This means that the cell containing the DNA must be broken with an enzyme and a soap. It is simply a way to isolate the DNA from foreign elements.

The second step is for the isolated DNA to be amplified; this is where the PCR method is distinctive. No more than fifty percent of the specimen being tested is added to a special mixture containing the chemicals that amplify the isolated DNA. This includes an enzyme found in hot springs (Taq polymerase), buffer salts, and primers, which are small pieces of DNA that recognize the four bases, A, T, G and C. It is Taq Polymerase specifically that copies the targeted gene.

The DNA in the PCR mixture is then denatured. This is done by heating and cooling a tube containing the mixture in cycles with a device called a thermal cycler. This process is automated with the use of a heating block. The cycle is typically repeated thirty or thirty-two times . . . . The greater the number of cycles performed, the larger the amount of DNA is produced. Each cycle doubles the amount of DNA being tested.

During a cycle, the primer targets the specific gene and will only bind to the genetically complementary portion of the DNA. At a different temperature, the enzyme works to build-up or copy the targeted gene. At the end of . . . thirty-five cycles, there are approximately sixteen billion copies of the strand of DNA that incorporates the targeted gene.

The third step is for the DNA to be placed onto a nitrocellulose filter to view what has been amplified. The allele-specific DNA being searched for is already on the filter. Only the DNA from the sample that is compatible with the gene being searched for will adhere to the filter. By washing the DNA strip with an enzyme, the filter should turn blue if the DNA has bound to it. A blue dot is a match; a blank is a non-match. The amplified DNA may then be typed for the various [examined gene's] genotypes. This process is referred to as the reverse-dot blot procedure or the blue-dot procedure.

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The great advantage of the PCR method compared to the RFLP method is that it is much quicker and may be used on much smaller samples of DNA, such as hair samples. It can be used on nearly microscopic specks of tissue containing as few as twenty to one hundred white blood cells rather than the five thousand to fifty thousand cells normally required by RFLP analysis. It also may be used more easily on samples of DNA that have degraded as a result of high temperatures or humidity. The results of PCR testing are also easier to interpret than the results of RFLP analysis.

[*People v Lee*, 212 Mich App 228, 266-268; 537 NW2d 233 (1995).]

See also National Research Council, *supra* at 69-74 (describing the PCR testing method). This Court has taken judicial notice of the general acceptance within the scientific community of both the PCR and RFLP DNA testing methods. *Lee, supra* at 282-283; *People v Chandler*, 211 Mich App 604, 611; 536 NW2d 799 (1995); *People v Adams*, 195 Mich App 267, 277; 489 NW2d 192 (1992), modified on other grounds 441 Mich 916; 497 NW2d 182 (1993).

D

Anita Matthews, a forensic serologist and the associate director of forensic identity testing at Laboratory Corporation of America in North Carolina (Lab Corp), testified at length as an expert in genetics concerning Lab Corp's comparisons of various samples of DNA recovered from the crime scene with known samples of the victim's and defendant's DNA. Lab Corp utilized the PCR method of analyzing DNA, examining the alleles present at twelve separate DNA loci.<sup>6</sup> With respect to the analyzed samples of blood taken from both the broken knife blade and the victim's bedroom doorknob, Matthews believed that these samples constituted mixtures of blood "from more than one person" because (1) the alleles present varied in their intensities, and (2) more than two characteristics existed at several DNA loci examined. Matthews denied that any of the test results enabled her to testify positively that the blood on the broken knife blade and door knob belonged to either defendant or the victim. She concluded, however, based on the PCR test results that neither defendant nor the victim could "be excluded as a possible contributor" to the mixed DNA recovered from the knife blade and doorknob. Matthews further explained that the mixtures of blood were "consistent with a mixture of DNA from more than one person. [Defendant] nor [sic] [the victim] could be excluded as possible contributors."

[Prosecutor] And what you found in the—particular as far as the knife and the doorknob, if you were to take a drop of blood from [defendant] and a drop of blood [victim] what you found there was that consistent with that?

[Matthews] Yes, it was. If I were to take a drop of blood or DNA from those two individuals and mix it together I would expect to find exactly the same results as what we found on those two items or—exactly the same set of characteristics.

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<sup>6</sup> Matthews explained that Lab Corp's DNA testing occurred at the following six DNA loci ("sequence polymorphisms"): (1) DQ Alpha, which contained seven different allele possibilities, or twenty-eight possible combinations when taking into account one individual's receipt of one allele from each of his parents; (2) LDLR, at which two possible alleles existed; (3) GYPA, at which two possible alleles likewise existed; (4) HBGG, at which three different alleles might be present; (5) D7S8, where only two different alleles might be found; and (6) GC, at which three different alleles might be detected. Matthews testified that further PCR testing occurred at five separate STR (short random repeat) locations (named TPOX, TH01, CSF1 PO, VWA and FES/FPS), at which four-nucleotide combinations were repeated numerous times, and one additional location, "an amplified polymorphism" (D1S80), where sixteen base pairs repeated up to twenty or over thirty times.

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[Prosecutor] And in this case your conclusion was there was a match between the Defendant and the sperm that you found?

[Matthews] Yes.

[Prosecutor] And it was consistent with the victim's blood and the defendant's blood on the knife?

[Matthews] Yes.

[Prosecutor] And on the door—the knob?

[Matthews] Yes.

While Matthews averred that “once we determine that two samples could have come from the same source then we could calculate a statistical estimate to give a likelihood of how common or how rare it is to find that set of characteristics in another individual,” Lab Corp performed no statistical interpretation of the results it achieved regarding the mixed DNA samples recovered from the knife blade and doorknob because “our laboratory policy is we do not calculate statistical estimates for mixed samples.”

## E

Neither this Court nor the Michigan Supreme Court previously has decided the question whether evidence of a possible DNA match is inadmissible on the basis that no statistical interpretation accompanied the potential match evidence. After considering the issue within the context of this case and persuasive authority from other jurisdictions, we find the instant evidence of a potential match between the blood on the knife blade and doorknob and the DNA samples from defendant and the victim inadmissible absent some accompanying interpretive evidence regarding the likelihood of the potential match.

## 1

Defendant's challenge to Matthews' testimony implicates MRE 702, which provides as follows:

If the court determines that recognized 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 critical inquiry with regard to expert testimony is whether such testimony will aid the factfinder in making the ultimate decision in the case.” *People v Smith*, 425 Mich 98, 105; 387 NW2d 814 (1986). The fact that, based on the DNA testing, defendant could not be excluded as a donor of the DNA recovered from the knife blade and doorknob had some tendency to make it

more likely than not that defendant's blood was on the knife. MRE 401. We find, however, that Matthews' testimony regarding the consistency of defendant's DNA with the mixed sample lifted from the knife blade and doorknob inadequate by itself to meaningfully inform the jury concerning the likelihood of defendant's identity as the DNA donor.

The following discussion by the Delaware Supreme Court succinctly describes the logic behind the statistical analysis of a DNA match:

DNA typing produces two distinct, but interrelated, items of information: 1) whether a match exists between the samples; and 2) if a match exists, the ratio expressing the statistical likelihood that "the crime scene samples came from a third party who had the same DNA pattern as the suspect." The latter correlation is necessary because, even though two human genomes may vary at approximately three million sites, the DNA typing analysis currently employed examines only a few sites for variation in the DNA sequence. The theory is that, besides identical twins, no two individuals will have entire DNA sequences which are identical. The DNA prints which result from the current FBI procedure may not be unique since the entire DNA molecule is not analyzed. Since two unrelated individuals may have identical DNA patterns from the fragments examined in a particular analysis, the potential exists for a match to be mistakenly found. For this reason, statistical interpretation regarding the probability of a coincidental match or the likelihood that two unrelated individuals have the same DNA type is necessary. [*Nelson v State*, 628 A2d 69, 75-76 (Del, 1993) (citations omitted).]

See also *Chandler*, *supra* at 608 ("DNA statistical analysis determines the frequency with which a particular match occurs in a target population<sup>7</sup>—how likely or unlikely it is that an individual other than the defendant has the same DNA bands as those found at the crime scene and in defendant's blood.")<sup>8</sup>

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<sup>7</sup> The Court in *Chandler* briefly summarized the general calculation process:

This process involves a comparison of each pair of matching bands to a data base composed of persons of a given race in a particular geographic location.

"The probability of the combination of two particular bands recognized by one of the probes is calculated by multiplying the product of the frequencies of the two bands by two. The probability of the band patterns from [the number of] loci [examined] is determined by multiplying the products from all [examined] loci. This is known as the 'product' or multiplication rule." [*Id.* at 608-609, quoting *Adams*, *supra* at 272-273, quoting *Axell*, *supra*.]

This Court has recognized the general acceptance within the scientific community of DNA statistical analysis evidence calculated utilizing the product rule, and judicially noticed the admissibility of these DNA statistical analyses. *People v Leonard*, 224 Mich App 569, 590-591; 569 NW2d 663 (1997); *Chandler*, *supra* at 610-611.

<sup>8</sup> See also National Research Council, *supra* at 25:

(continued...)

While in this case the jury was provided the information that defendant's DNA could not be excluded as that present on the knife blade and doorknob, the trial record is devoid of any supplemental probability or statistical analysis giving meaning to the fact of the potential DNA match, i.e., to what extent was it likely that defendant represented an individual who contributed to the mixed samples. We are unable to detect from the available record of Matthews' testimony exactly how many of the various loci examined reflected alleles matching both the mixed sample and defendant's DNA profile. As this Court previously hinted in *Adams, supra* at 279, "The results of DNA identification testing would be a matter of speculation without the statistical analysis." No indication exists whether the instant defendant and a sizable segment of the human population necessarily would yield DNA samples consistent with the mixed samples tested in this case, or whether due to some rarity or characteristic infrequency shared by defendant's DNA and the mixed samples the appearance of defendant's DNA characteristics would represent a striking coincidence if some of the mixed DNA did not in fact belong to defendant.<sup>9</sup>

It appears that the majority of other states' courts share the view that evidence of a DNA match without accompanying statistical interpretation is meaningless and inadmissible. For example, the Delaware Supreme Court in *Nelson, supra* discussed as follows the minimal value of a potential DNA match alone:

The Committee on DNA Technology in Forensic Science has stated:

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If the DNA profile from the evidence sample and that of the suspect match, they may have come from the same person. Alternatively, they might represent a coincidental match between two persons who happen to share the profile. To assess the probability of such a coincidental match, we need to know the frequency of the profile in the population.

Ideally, we would know the frequency of each profile, but short of testing the whole population we cannot know that. We must therefore rely on samples from the population, summarized in a database.

<sup>9</sup> See also *Harmon v State*, 908 P2d 434, 441 (Alas App, 1995):

That genes are shared by groups of people is of crucial significance when DNA testing is employed to identify the perpetrator of a crime. Even though DNA testing can accurately identify a person's genes, the fact that a person carries a particular gene means little unless scientists can also tell us the likelihood that other people share that same gene. The fact that a defendant carries the same gene as was found in a tissue sample taken at the scene of the crime is not particularly probative if a high percentage of the population also carry that same gene; conversely, if the gene is quite rare, then the DNA match becomes correspondingly more probative.

"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."

[Committee on DNA Technology in Forensic Science, National Research Council, *DNA Technology in Forensic Science* (National Academy Press April 1992), at p] 74 (emphasis added).

Several courts consider the statistical calculation (third) step as the more important of the two pieces of information which constitute DNA evidence. See, e.g., [*United States v*] *Porter*, 618 A2d [629,] 640 [(DC App, 1992)] (statistics are an "integral part" of DNA evidence and "essential"); [*People v*] *Barney*, [8 Cal App 4<sup>th</sup> 798;] 10 Cal Rptr 2d [731,] 742 [(1 Dist, 1992)] (statistical calculation is "pivotal element of DNA analysis"). Whether the statistical evidence is labeled "integral" or "pivotal," the statistical calculation is essential for the evidence to have relevance or meaning to the trier of fact.

Since the issuance of the DNA Committee Report, an overwhelming majority of courts have excluded the evidence of a match after finding the corresponding statistical calculation to be inadmissible because not scientifically reliable. See [*State v*] *Cauthron*, [120 Wash 2d 879;] 846 P2d [502,] 516 [(1993)]<sup>10</sup> (citing *Commonwealth v Curnin*, 409 Mass 218; 565 NE2d 440, 442, n 7 (1991) and *Ex parte Perry*, 586 So 2d 242, 254 (Ala, 1991)); [*State v*] *Vandebogart*, [136 NH 365;] 616 A2d 483,] 494 [(1992)] (evidence of match not admissible if not accompanied by scientifically reliable population frequency estimate); [*Commonwealth v*] *Lanigan*, [413 Mass 154;] 596 NE2d [311,] 314 [(1992)] (match evidence "cannot be admitted without appropriate statistical support"); *Barney*, 10 Cal Rptr 2d at 745; but see [*State v*] *Pierce*, [64 Ohio St 3d 490;] 597 NE2d [107,] 115 [(1992)] (statistical calculations go to the weight, not admissibility of DNA evidence). We adopt this view and hold that DNA evidence is only admissible when both the evidence of a match and the statistical significance of the match are admissible. Thus, we reject the State's overly simplistic argument that statistics go simply to the weight, not the admissibility of the DNA matching evidence.

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. . . [W]ithout the necessary statistical calculations, the evidence of the match was "meaningless" to the jury and, thus, inadmissible. [*Nelson, supra* at 76.]

<sup>10</sup> An en banc panel of the Washington Supreme Court concluded in *Cauthron* that unequivocal expert testimony of a DNA match implicating the defendant without accompanying statistical interpretation evidence violated Washing Evidence Rule 702's requirement that expert testimony assist the trier of fact. *Cauthron*, 120 Wash 2d at 906-907.

In *State v Carter*, 246 Neb 953; 524 NW2d 763 (1994), the Nebraska Supreme Court opined that the statistical interpretation evidence concerning a DNA match was inadmissible because the method of calculation was not generally accepted,<sup>11</sup> then faced the question whether the DNA match evidence still might be admissible without the statistical interpretation:

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. 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."

"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." *US v Yee*, 134 FRD 161, 181 (ND Ohio, 1991). The court in *People v Barney*, 8 Cal App 4<sup>th</sup> 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 P2d 502, 516 (1993). See, also, *State v Anderson*, 115 NM 433; 853 P2d 135 (NM App, 1993); *State v Vandebagart*, *supra*; *Commonwealth v Curnin*, 409 Mass 218; 565 NE2d 40 (1991). [*Carter*, *supra* at 984.]

See also *State v Brown*, 470 NW2d 30, 33 (Iowa, 1991) (rejecting the defendant's challenge to the admission of expert testimony regarding statistical probabilities because "it is doubtful that jurors could take the probabilities of the four separate segments, combine them, and arrive at an answer with any degree of certainty as to its correctness;" and finding that "[f]urnishing statistical analysis would assist the trier of fact in such a case and that is the heart of admissibility under [Iowa Rule [of Evidence] 702. Without statistical evidence, the ultimate results of DNA testing would become a matter of speculation.")

We also note the following discussion by the National Resource Council in its 1996 report regarding forensic DNA evidence:

Many courts have held that unless the finding of a match is accompanied by some generally accepted or scientifically sound profile frequency or probability estimate, no testimony about DNA testing is admissible. A few courts, thinking

<sup>11</sup> In *State v Freeman*, 253 Neb 385, 413; 571 NW2d 276 (1997), the Nebraska Supreme Court upheld the trial court's admission of FBI probability analysis, overruling *Carter*, *supra*, "[t]o the extent that *Carter* is based on an outdated level of acceptance of this [probability analysis] evidence by the relevant scientific community."

that existing estimates lack acceptance or validity, have excluded quantitative expressions of the frequency of the matching profile while allowing testimony about the match itself. The insistence on quantitative estimation has been fueled by the observation in the 1992 NRC report (page 74) that "[t]o say that two patterns match, without providing any scientifically valid estimate (or, at least, an upper bound) of the frequency with which such matches might occur by chance, is meaningless."

*Certainly, a judge's or juror's untutored impression of how unusual a DNA profile is could be very wrong. This possibility militates in favor of going beyond a simple statement of a match, to give the trier of fact some expert guidance about its probative value. [National Resource Council, supra at 193 (citations omitted, emphasis added).]*

We conclude that absent some analytic or interpretive evidence concerning the likelihood or significance of a DNA profile match, Mathews' testimony concerning the potential match between defendant's DNA and the DNA contained within the mixed blood samples found on the knife blade and doorknob was insufficient to assist the jury in determining whether defendant contributed DNA to the mixed sample.<sup>12</sup> MRE 702; *Smith, supra*. We emphasize that we do not now declare or delineate the appropriate articulations for expressing the extent or meaning of a potential match, but merely hold that some qualitative or quantitative interpretation must accompany evidence of the potential match.<sup>13</sup>

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<sup>12</sup> The prosecutor argues on appeal that "[o]ther jurisdictions have held that DNA evidence may be admitted without statistical estimates, including mixed samples," citing *People v Watley*, 245 AD2d 523; 667 NYS2d 376 (1997) and *Brodine v State*, 936 P 2d 545 (Alas App, 1997). We briefly observe that the court in *Brodine* reviewed the record and found that any error in admitting evidence of a potential DNA match without statistical interpretation constituted harmless error. Unlike the instant case, the court in *Brodine* specifically noted that "[i]t does not appear from the record that the state argued that the DNA results, which showed that Brodine could not be excluded as a donor, were conclusive proof that the DNA could only have been Brodine's," and found "no reasonable possibility that the jury could have misinterpreted the significance of this evidence." *Id.* at 551-552. To the extent that *Watley* and *Brodine* stand for the proposition that evidence of a DNA match is properly admitted without accompanying statistical interpretation evidence, we disagree and decline to follow these nonbinding precedents. For another case, with which we disagree, specifically finding evidence of a DNA match alone of assistance to the jury according to state rules of evidence, see *Sholler v Commonwealth*, 969 SW2d 706, 710 (Ky, 1998) (admitting evidence of a potential DNA match and finding sufficient the DNA expert's "explanation of the significance of a DNA match, albeit to the limited extent that the results did not prove that Appellant was the source of the semen, but only that he could not be excluded as a possible source.").

<sup>13</sup> For a discussion concerning the pros and cons of the various manners for expressing the meaning of a potential match, see National Resource Council, *supra* at 192-202.

MRE 403 represents another basis for excluding evidence of the potential match between defendant's DNA and the mixed DNA samples obtained from the knife blade and doorknob. This rule operates to exclude evidence when "its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury." As we have discussed, we find the instant evidence of a potential match between defendant's DNA and the mixed samples to possess minimal probative value absent accompanying interpretive statistical analysis evidence. Because no evidence conveys the likelihood that defendant's DNA could not be excluded as present in the mixed samples, the significant possibility exists that the jury might have attributed the potential DNA match preemptive or undue weight, thus unfairly prejudicing defendant.<sup>14</sup> We find that the risks of confusion of the jury, especially in light of the testimony regarding the enormous probability that defendant contributed the sperm samples removed from the victim, specifically that one in 543 million African-Americans might possess the same DNA profile matching defendant's and the sperm sample's characteristics, and consequent unfair prejudice to defendant substantially outweighed any minimal probative value possessed by evidence of the potential DNA match between defendant's DNA and the mixed samples. See *People v Rice (On Remand)*, 235 Mich App 429, 441; 597 NW2d 843 (1999) (noting that "[p]rejudice inures when marginally probative evidence would be given undue or preemptive weight by the jury").

We therefore conclude that the admission of Matthews' incomplete testimony concerning the potential donors to the mixed samples constituted plain violations of Michigan Rules of Evidence 702 and 403. *Grant, supra* at 548-549 (plain error represents a clear or obvious deviation from a legal rule).

#### F

Though plain error occurred during defendant's trial, defendant nonetheless forfeits our consideration or correction of the error unless he demonstrates that the plain, unpreserved error was decisive of his trial's outcome. *Carines, supra* at 763; *Grant, supra* at 553. In determining whether such prejudice exists, we review the entire record. *Carines, supra* at 772, n 18. We find that defendant adequately demonstrated that under the circumstances presented in this case, the erroneously admitted DNA evidence affected the trial's outcome.

The prosecutor theorized that the following evidence established defendant's murder of the victim: defendant by his own admission had an intimate relationship with the victim and regularly visited the victim's apartment; McKee's testimony that on the day of the murder the victim requested that McKee page defendant and remind him to visit the victim's apartment that night; McKee's testimony that on entering the apartment immediately prior to discovering the victim's body she observed defendant's headphones, which he lent McKee and used when

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<sup>14</sup> Furthermore, as will be discussed in more detail later in this opinion, the prosecutor mischaracterized the potentiality of a match between defendant's DNA and the mixed samples by suggesting that the statistical probabilities regarding the presence of defendant's sperm likewise indicated the presence of defendant's blood in the mixed samples and by repeatedly and unequivocally proclaiming that defendant's blood was on the knife blade and doorknob.

visiting the apartment;<sup>15</sup> McKee's testimony that she also observed marijuana in an ashtray and burnt incense, and that she previously observed defendant burn incense while smoking marijuana; that testing revealed odds of one in 543 million that an individual other than defendant represented the source of sperm cells recovered from smears of the victim's rectum and vagina, and that testing could not exclude defendant as a contributor to the mixed blood samples found on the broken knife blade and the bedroom doorknob; defendant's admitted presence on the day of the murder within the same apartment complex where the victim lived; and the post murder presence of cuts on defendant's right palm and thumb.

We observe that the extremely high degree of probability that defendant donated the sperm samples obtained from the victim does not necessarily establish his presence at the victim's apartment when the murder occurred, apparently late on January 4, 1998. Defendant did acknowledge a sexual relationship with the victim and estimated that in an average week he visited the victim's apartment three times, but averred that his last sexual encounter with the victim occurred during the last week in December 1997. A forensic serologist testified that some of the sperm cells she located possessed tails, and that while "it's not uncommon for the tails to last up to 16 hours," "[t]here have been documentations where they have seen them longer in a woman's body." The serologist did not detect the presence of any seminal fluid, and recalled that sperm cells had been recovered as long as six days after sexual intercourse occurred. The pathologist who autopsied the victim's body indicated previously recovering sperm cells up to nineteen or twenty days after an individual's death.<sup>16</sup>

None of McKee's testimony positively placed defendant in her and the victim's apartment on the night of the murder. McKee denied paging defendant on January 4, 1998 and reminding him to visit the victim because she became busy at work and forgot the victim's request. McKee testified that someone plugged in defendant's headphones while she was working and that marijuana and incense had appeared in ashtrays during her absence. While McKee remembered previously having seen defendant smoke marijuana and burn incense, defendant's probation officer testified that a January 6, 1998 full panel urine test taken two days after the offense, which should detect marijuana use occurring from two weeks to one month prior to the test, returned a negative result with respect to marijuana.

Regarding defendant's presence on January 4, 1998 within the same apartment complex where the victim resided and the appearance of cuts on his right hand, defendant produced several alibi witnesses corroborating his whereabouts and explanation of the injuries. The lead police investigator testified that she estimated the period between 10:00 p.m. Saturday (1/4/98) and 12:00 a.m. Sunday (1/5/98) represented the time of death.<sup>17</sup> Defendant testified that from

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<sup>15</sup> McKee recalled observing when she arrived home early on January 5, 1998 that someone had plugged defendant's headphones into a stereo. According to McKee, defendant would use the headphones during his visits, but the victim did not use them.

<sup>16</sup> The pathologist testified that he found no indications of sexual assault.

<sup>17</sup> The pathologist testified that he did not attempt to determine an approximate time of death. One of the paramedics who arrived on the scene shortly after 3:30 a.m. on January 5, 1998 stated that the victim's body was in rigor mortis. According to the pathologist's testimony, rigor mortis  
(continued...)

approximately noon until 9:30 or 9:45 p.m. on January 4, 1998 he babysat his two children while the children's mother worked. The children's mother and each maternal grandparent, with whom defendant and the children spent the day watching football, confirmed this alibi testimony. The children's mother recalled that defendant appeared in a good mood. She and defendant remembered that as defendant walked past the victim's apartment building he looked up toward the victim's apartment.

Defendant explained that because he observed no lights on inside the victim's apartment, he continued the approximate one-half hour walk to the dwelling he shared with his girlfriend, Melissa Lewis. Both defendant and Lewis estimated that defendant arrived home between approximately 10:30 and 10:45 p.m. After ten or fifteen minutes, defendant and Lewis briefly visited Lewis' mother,<sup>18</sup> who lived in close proximity. Lewis and her mother testified that defendant appeared normal and acted silly. According to defendant's and Lewis' testimony, they returned home, ate dinner, went to sleep, and awoke early the next morning for work, where defendant cooked and washed dishes.

Defendant's employment supervisor Pamela Palmer explained that an individual with cut hands either would not wash dishes or wear gloves, that she saw defendant at work on January 5, 1998, and did not recall him wearing any gloves. Lewis and another coworker averred that at work on January 5 defendant had no cuts on his hands. Defendant's probation officer testified that when defendant attended his January 6, 1998 probation appointment, he did not notice that defendant had any cuts on his hands, and believed that he likely would have noticed if defendant's hand was wrapped. Defendant explained at trial that he cut his right hand during the afternoon of January 6 after his probation meeting while cleaning out a vehicle. According to defendant, when he placed some refuse into a garbage can some broken glass inside the can cut his hand. The testimony of Lewis, her mother, and Lewis' sister indicated that on the afternoon of January 6 defendant and Lewis arrived at Lewis' mother's home and wrapped defendant's hand in a towel, and that Lewis' sister then transported defendant to the hospital. An emergency room physician testified that his records reflected that he treated defendant's cut hand late in the afternoon of January 6, 1998. The physician characterized defendant's wounds he cleaned and sutured as "fresh," "less than a day," and did not believe that defendant's wounds appeared reopened.

Defendant denied killing the victim or having any reason to murder her. The trial record reflects that McKee advised the police of potential suspects other than defendant, and that the police investigated several other suspects, including McKee. The police obtained from the murder scene no fingerprints, and did not obtain a warrant to search defendant's residence. No blood subtyping evidence potentially connected defendant to the knife blade's and doorknob's mixed samples: the serology expert explained that she did not perform subtyping of the

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(...continued)

could begin within three to four hours or so after death, and lasted until the body decomposed.

<sup>18</sup> Lewis' mother corroborated that defendant and Lewis visited her on the evening of January 5, 1998, but indicated her uncertainty regarding the time of the visit, estimating between 9:30 and 10:00 p.m.

doorknob sample, and that her subtyping of the knife blade's mixed sample yielded no results. Testing of DNA samples from other objects the police discovered inside the victim's bedroom, including hairs removed from the victim's body and the bloody pen found on the floor of the victim's bedroom, indicated consistency with the victim's DNA profile and excluded defendant as a contributor.

The only remaining evidence implicating defendant constituted the fact that defendant could not be excluded as a contributor to the mixed DNA samples taken from the knife blade and doorknob. As we have discussed at some length, this potential match evidence was improperly admitted without some further explanation regarding its significance. Furthermore, the record illustrates that the prosecutor exacerbated the error in admitting this evidence that defendant's and the victim's DNA were consistent with the mixed samples by in his closing argument mischaracterizing Matthews' testimony:

The weapon used to kill [the victim] was examined for DNA. They found a mixture of more than one person's blood on it. And as she [Matthews] pointed out you could tell . . . . [it was] consistent with [the victim]'s blood and [defendant]'s blood on the weapon that was used to kill her.

You may recall Anita Matthews said that if she took a drop of blood from [the victim] and a drop of blood from [defendant], mixed the two together, she would expect to find on that mixture exactly what she found on the knife.

That wasn't the end of her testimony. She told us a little bit about statistical analysis, how in these alleles, the various locations you have a certain percentage in the human population. And they take those odds based on the data they collected over time and take those and determine how frequent is [sic] all eleven of those alleles in this person. How likely is it to get those alleles in someone else besides in this case the Defendant.

One of the . . . answers she gave at one point caught my attention toward the end of her testimony. She was asked what does that really mean, the one in 543 million, what does that really mean. She told us how it's an estimate. And basically means if you went out and tested . . . 543 million people [defendant] would be the only one with the same profile. Twice the population of this country and he's the only one based on analysis that she did.

And that, ladies and gentlemen, if you recall is based on if you tested just the African-Americans only, that you tested the Caucasian it was over four billion, if you tested the Hispanics depending on Southeastern or Southwestern, two billion or four billion. What that really means is just how rare that DNA profile is.

What we have proven to you, ladies and gentlemen, in this case is that the sperm found in [the victim]'s vagina, her rectum was the Defendant's. *What we have proven to you in this case is that the blood on that door where the swipe was*

*at [sic] and the blood on that knife that killed her was both the Defendant's and the victim's.*

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And again the Court will tell you that you can consider circumstantial evidence, evidence that has one fact in it, then evaluate that, does that lead you to a reasonable belief of the next fact. *His blood on the murder weapon. Her blood on the murder weapon.*

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Reasonable doubt, ladies and gentlemen, in this case . . . is doubt based on reason and common sense. And I'm asking you to use and consider during your deliberations, use your common sense, 'cause what we have shown you in this case is that [the victim] was brutally murdered. . . . [W]e have also shown to you in this case that the Defendant . . . is the murderer. *His blood on the knife, his blood on the door, his sperm in her vagina, the headsets, the cut, we have proven beyond a reasonable doubt, ladies and gentlemen, and based on that you must come back with a verdict of guilty of first degree murder.*

The prosecutor continued as follows during his rebuttal closing argument:

[W]e have all heard about the smoking gun, you know. The murder case where [sic] prosecutors dream about there's a Defendant standing there holding a gun in his hand. It's smoking, coming out of it, there's the victim just laying over there dead, having been shot. Okay. Ladies and gentlemen, *here we got the bleeding knife. The knife that has the Defendant's blood on it—*

[*Defense counsel*] Objection, your Honor. No testimony was ever given that his blood was on that knife.

[*The Court*] Sustained. This is argument, but it must be related to what the actual testimony was so I will sustain the objection.

The prosecutor improperly argued unequivocally that defendant left his blood on the knife blade and doorknob. See *Lee, supra* at 255 ("A prosecutor may not argue facts not entered into evidence.")<sup>19</sup>

We further note that the jury evidently experienced some difficulty reaching its verdict, specifically with the DNA evidence presented. The record indicates that the jury deliberated for

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<sup>19</sup> While a prosecutor remains free to argue the evidence and all reasonable inferences arising therefrom, in this case no reasonable inference that the blood on the knife blade and doorknob unquestionably came from defendant arises from the fact that defendant likely left the sperm samples. *Id.*

approximately nineteen hours over the course of four days. After commencing deliberations during the afternoon of December 22, 1998 and resuming early on December 23, 1998, in the afternoon of December 23 the jury forwarded to the court a note stating that it could not reach a unanimous verdict. As instructed, the jury returned to deliberations for approximately seventy-five minutes before requesting to rehear Matthews' testimony. The court provided the jury transcripts of this testimony in the morning of December 28, 1998, and the jury deliberated until after 3:00 p.m. that afternoon, returned in the morning of December 29, 1998, later that afternoon returning its verdict of second-degree murder. We will not speculate concerning the jury's view of the evidence, but observe that the jury's expressed difficulty reaching a verdict and its request for Matthews' testimony reflect its particular concern regarding the DNA evidence.

Given (1) the absence of direct evidence linking defendant with the murder weapon, other than the unexplained potential DNA match between defendant and the mixed samples, (2) defendant's presentation of many and varied corroborative alibi witnesses; (3) the apparently objective testimony of defendant's employer and probation officer and the treating emergency room physician supporting defendant's suggestion that the cuts on defendant's hand appeared after the time of the victim's murder; (4) the prosecutor's improper argument that defendant's blood was in fact on the knife blade and doorknob; and (5) that the prosecutor's closing argument seemed to relate the statistical evidence concerning the likely presence of defendant's sperm to the alleged presence of defendant's blood on the murder weapon, creating the risk that the jury might have been persuaded that a minuscule probability existed that someone other than defendant left DNA samples on the knife blade and doorknob, we are constrained to conclude that the erroneous evidence of the potential DNA match affected the outcome of the proceedings. We conclude that defendant "establish[ed] the form of prejudice necessary to preserve an issue that was not raised [properly] before the trial court." *Grant, supra* at 553-554.

## G

Because we have ascertained the existence of an outcome determinative plain error, we next must exercise our discretion whether to correct the plain unpreserved error, specifically, whether the error warrants reversal of defendant's conviction. *United States v Olano*, 507 US 725, 734-736; 113 S Ct 1770; 123 L Ed 2d 508 (1993); *Carines, supra*; *Grant, supra* at 549. Reversal on the basis of an unpreserved error must only occur in rare and egregious circumstances, "only when the plain, forfeited error resulted in the conviction of an actually innocent defendant or when an error 'seriously affect[ed] the fairness, integrity or public reputation of judicial proceedings' independent of the defendant's innocence." *Carines, supra*, quoting *Olano, supra* at 736-737. While the available record leaves us unprepared to declare defendant's actual innocence, we find that in the context of the otherwise weak case presented by the prosecution the interjection of improper and meaningless DNA testimony, together with the prosecutor's confusing and improper suggestion that defendant's blood definitely was present on the knife blade and doorknob, very seriously affected the fairness and the integrity of the instant judicial proceedings. We simply cannot point to properly admitted evidence of defendant's guilt within the instant record sufficient to erase or overcome the taint of the improperly admitted evidence of a potential DNA match and instill our confidence in the integrity of defendant's trial.

In conclusion, we are mindful of the history and strong policy favoring issue preservation and the social costs involved in granting a convicted defendant a retrial. *Grant, supra* at 550-551. We emphasize that by no means should our decision be construed to suggest that the admission of DNA testing evidence lacking the accompanying, interpretive statistical analysis in every case represents error requiring reversal. In this case, however, we cannot sanction defendant's conviction on the basis of mischaracterized and unexplained expert testimony concerning the possible presence of defendant's blood on the knife blade and doorknob. Accordingly, we must vacate defendant's conviction and remand for a new trial.

## II

Defendant on appeal raises further assertions of error. In light of our decision to grant defendant a new trial, at which defendant's instant claims of error might resurface, we briefly address these issues.

Defendant next argues that the trial court erred in denying his motion to quash the search warrant for his blood and saliva samples because "the search warrant affidavit contained materially false information. . . . [and] the remainder of the affidavit was insufficient to support the probable cause determination." Even assuming that the police officer affiant intentionally fabricated his statement that someone informed him that the victim and defendant engaged in anal and vaginal intercourse, our de novo review of the total affidavit reveals that this falsity was not necessary to a finding of probable cause. *People v Williams*, 240 Mich App 316, 319; 614 NW2d 647 (2000). Evaluating the search warrant and underlying affidavit in a common sense and realistic manner, we find that the remainder of the affidavit, including the information that (1) defendant and the victim recently shared a sexual relationship, according to defendant's own admission and statements of acquaintances of the victim; (2) an autopsy indicated that the victim was murdered and that the victim's rectum and vagina contained sperm "sufficient . . . to permit laboratory analysis and comparison"; (3) although defendant denied engaging in sexual intercourse with the victim during the two weeks prior to her murder, defendant acknowledged his presence in the victim's apartment on the night before the murder; and (4) although defendant's claim that his sexual encounters with the victim were limited to fellatio might not have "contradict[ed] . . . what [the victim] had told her friends," defendant's denial of other sexual acts appeared inconsistent with the autopsy's findings of sperm, warrants a reasonably cautious person's conclusion that "evidence of criminal conduct will be found" in the search involving defendant's blood and saliva. *People v Darwich*, 226 Mich App 635, 636-637; 575 NW2d 44 (1997). We therefore conclude that the trial court properly found probable cause absent the alleged falsity and denied defendant's motion to quash.

## III

Defendant lastly asserts that the trial court erred in denying his pretrial motion to quash the district court bindover and his motion for directed verdict regarding the first-degree murder charge because the prosecutor presented insufficient evidence to demonstrate the premeditation and deliberation necessary to establish first-degree murder. Premeditation, which requires sufficient time to permit the defendant to take a second look, may be inferred from the circumstances surrounding the killing. *People v Kelly*, 231 Mich App 627, 642; 588 NW2d 480 (1998). The victim's autopsy revealed four deep, parallel, individually fatal stab wounds to the

victim's back that the pathologist opined "had to be late in the course of a struggle. Or after the subject was otherwise incapacitated." The pathologist additionally averred that several of the twenty-five to thirty stab wounds the victim suffered represented defensive wounds incurred when the victim resisted her attacker, and that the victim also experienced several blunt force wounds. *People v Johnson*, 460 Mich 720, 733; 597 NW2d 73 (1999) ("[Defensive wounds suffered by a victim can be evidence of premeditation.]; *People v Coddington*, 188 Mich App 584, 600; 470 NW2d 478 (1991) ("Factors which may be considered to establish premeditation include . . . the circumstances of the killing itself, including the weapon used and the location of the wounds inflicted."). See also *Kelly, supra* (noting that evidence the victim experienced different methods of assault, stabbing and beating, supported a finding of premeditation). Evidence showed that prior to the victim's murder defendant and the victim were involved in a sexual relationship, and that the victim met her untimely death inside her apartment where the police detected no signs of a breaking and entering. *People v Abraham*, 234 Mich App 640, 656; 599 NW2d 736 (1999) (noting that evidence of a prior relationship between the parties helps to establish premeditation). Viewing these circumstances in the light most favorable to the prosecution,<sup>20</sup> we cannot conclude that insufficient evidence of premeditation existed.<sup>21</sup> *People v Plummer*, 229 Mich App 293, 299; 581 NW2d 753 (1998) (noting that in reviewing a sufficiency of the evidence argument this Court must view the evidence in the light most favorable to the prosecution and determine whether a rational trier of fact could find that the essential elements of the crime were proved beyond a reasonable doubt).

We reverse defendant's conviction and remand for a new trial. We do not retain jurisdiction.

/s/ Hilda R. Gage  
/s/ Michael J. Talbot  
/s/ Harold Hood

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<sup>20</sup> Although the trial court did not specifically enumerate all these circumstances in denying defendant's motions, we nonetheless affirm the trial court's correct result. *People v Rodriguez*, 236 Mich App 568, 574; 601 NW2d 134 (1999).

<sup>21</sup> With respect to defendant's argument regarding his motion to quash the bindover, we note *People v Baugh*, \_\_\_ Mich App \_\_\_; \_\_\_ NW2d \_\_\_ (Docket No. 225795, issued 10/13/00), slip op at 3 (observing that "the prosecutor did not need to present evidence of premeditation and deliberation during the preliminary examination to support a bindover on a charge of open murder"), and *Coddington, supra* at 593-594 ("[T]he elements of premeditation and deliberation are not required elements for which evidence must be presented at a preliminary examination in order to bind a defendant over for trial on open murder charges.").