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***Patterson v. Commonwealth: An Illustration of the Legal
Complexity of DNA Databases***

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I. INTRODUCTION

In the old-fashioned drawing-room murder mysteries, the villain usually eliminated his target in some Victorian manner—asphyxiation in bed with a pillow, drowning in a clawed-foot tub, stabbing in the back with a letter opener—and then skulked away, convinced he had committed the perfect crime. In the plot of these mysteries, the foil to the crime always proved to be the experienced detection of a meticulous sleuth. Agatha Christie would use the skills of Hercule Poirot or Miss Marple within the plot of her novels to detect the one flaw in the murderer’s technique. Perhaps there was some painfully obvious motive held by one of the guests at the summer home. Perhaps the villain’s mother embroidered the pillow used to asphyxiate the victim, or the letter opener was engraved with a unique identifying mark. Regardless of the simplicity or complexity of the villain’s methods, he was always caught. In these novels, there was no such thing as the perfect crime.

In the modern murder mystery, the observant sleuth could be easily replaced by a far more scientific foil to the perfect crime — DNA evidence. DNA, or deoxyribonucleic acid, is a chemical strand found in the nucleus of cells, often referred to as a “genetic blueprint,” and its uniqueness to each human being can make it a useful form of evidence against (or even for) suspects to a crime.¹ Such a tool has the potential to make previously unsolved crimes solvable, and DNA has been used in this manner to provide answers to an ever-increasing number of violent crimes.

In 1987, James Earl Patterson tied down and brutally raped Joyce Aldridge. He then stabbed her seventeen times with a kitchen knife and left her to die.² Patterson was not connected with Aldridge’s murder until 1998, when evidence from the crime was resubmitted to the Virginia DNA Data Bank³ and yielded a match, or “cold hit,” with Patterson’s DNA.⁴

Although Patterson denied any connection with the crime until two years later, in March 2000, while already serving a twenty-five year penitentiary sentence for another rape, he admitted to the murder.⁵ The Supreme Court of Virginia affirmed Patterson's death sentence for Aldridge's murder in 2001.⁶

The Virginia legislature established the Virginia DNA Data Bank that proved so instrumental to the Aldridge investigation in 1989.⁷ The Virginia DNA Data Bank contains the biological samples that Virginia law requires to be taken from felons convicted "on or after July 1, 1990" or "incarcerated on July 1, 1989."⁸ Evidence from crimes like the Aldridge murder can be submitted to this database in order to discover a perpetrator or, sometimes, to excuse from guilt an already-named suspect. The Commonwealth of Virginia, while it was the first to do so,⁹ is not alone in its efforts to create a central clearinghouse for DNA data. All forty-nine other states have created DNA databases of some type.¹⁰ In addition, the FBI created the Combined DNA Index System (CODIS) in 1990, the Convicted Offender Index in 1994, and in 1998, the National DNA Index System, all of which provide a central storehouse of DNA information at the federal level.¹¹

However, along with the increasing use of DNA and DNA databases comes great criticism over its impact on the constitutional rights of felons — and other individuals. Professor Clay Smith noted in his 1994 article, "DNA profiling definitely has the potential to violate the Fourth Amendment and privacy rights of all individuals in the not too distant future."¹² The creation of these databases requires the collection of biological samples, sometimes in an involuntary manner. The fact that these collections are often conducted specifically for the purpose of saving the samples to indicate guilt for other crimes arguably impacts a wide variety of constitutional and fundamental rights. Whether or not this impact amounts to such a severe

violation of individual rights that it should reduce or eliminate future use of these databases is a matter still up for debate.

This Note will discuss the effects of *Patterson v. Commonwealth* in light of the greater landscape of DNA databases and their uses. This Note will exclude the complex explanations necessary to describe the scientific nature of the various forms of DNA testing, and will instead concentrate on *Patterson*'s role in illustrating the growing applications of DNA databases in criminal cases, and the issues raised by this increase in use. Part II discusses the current applications of DNA databases, first in Virginia and then in other states. Part III addresses the impact DNA databases have on felons' rights, as well as the rights of other citizens. Lastly, Part IV explores the possible future uses of DNA databases and their potential impact on crime and society as a whole.

II. CURRENT USES OF DNA DATABASES

A. *The Virginia DNA Data Bank*

Section 19.2-310.2 of the Virginia Code Annotated requires that all convicted felons submit a sample of "blood, saliva, or tissue" to be used for DNA analysis and inclusion in the Virginia DNA Data Bank.¹³ It was due to this requirement that James Earl Patterson was eventually linked with the murder of Joyce Aldridge. Because he was convicted of another rape and was serving a sentence for this crime, his DNA was collected for the Data Bank, later yielding the "cold hit" that eventually resulted in his execution.¹⁴ By the time Patterson's case reached the Supreme Court of Virginia, Patterson had opted not to present any evidence that might have reduced or mitigated his sentence, expressing "his sorrow and remorse for his actions and request[ing] a sentence of death."¹⁵ Patterson did not admit to Aldridge's murder before his

DNA linked him to the crime; thus, it appears unlikely that he would have confessed without the catalyst of the DNA evidence with which the police confronted him.

There is another side to the coin in DNA analysis, however. While such evidence can be used to aid in the identification of a criminal, it can also be used to exonerate an innocent person who was misidentified. Virginia statute provides a method by which convicted felons can request scientific analysis of newly-discovered evidence, or analysis of the same evidence using newly-discovered methods.¹⁶

This section of code did not prove useful to the plaintiff in *Harvey v. Horan*, where a state prisoner attempted to sue the Commonwealth's Attorney of Fairfax County, Virginia, using a Federal Torts Claim Act "Section 1983" action.¹⁷ While an in-depth discussion of the nature of a Section 1983 action is outside the scope of this discussion, it is sufficient to say that the statute provides a basis for individuals to sue state or local officials for violations of constitutional rights.¹⁸ Harvey claimed the defendant prosecutor deprived him of his constitutional right of due process by denying him access to biological evidence from the rape in which Harvey played a part.¹⁹ In conjunction with the Innocence Project, Harvey wanted to resubmit the evidence for Short Term Repeat ("STR") DNA testing, a scientific advancement unavailable at the time of his conviction.²⁰

The Commonwealth Attorney's basis for denying Harvey's access was the conclusion that any new DNA test could not prove Harvey's innocence, a key statutory requirement,²¹ because the victim of the rape testified that only one of her two attackers ejaculated.²² Harvey disputed this basis, stating that the STR DNA test might provide a means to prove his innocence.²³ The Court of Appeals for the Fourth Circuit affirmed the judgment of the court for the Eastern District of Virginia that Harvey submitted his case improperly, as § 1983 was an

inappropriate means of pursuing the evidence.²⁴ While the court focused more on Harvey's constitutional claim rather than the assertion that the evidence might prove his innocence, they did address the fact that already-tested evidence, rather than new evidence, was at issue.²⁵

The *Harvey* decision illustrates the subjectivity that is inherent in making the judgment of whether or not evidence "may prove the convicted person's actual innocence."²⁶ The word "may" appears to open the statute to most honest pursuits of new DNA testing in order to prove innocence, but the reality proved to be otherwise in *Harvey*. A defendant's assertion that DNA analysis may exonerate him will not always assure that evidence will be submitted (or resubmitted) to that analysis.

B. DNA Databases in Locations Other Than Virginia

The different DNA databases created nationwide have various requirements for the types of convicts who are compelled to submit samples.²⁷ The success of DNA databases in yielding matches to crimes has been slow to develop, largely resulting from the slow speed of the current means of analysis. However, as of the year 2000, 583 "cold hits" had been yielded by the national DNA database kept by the FBI.²⁸ On the state level, both Virginia and Florida, due to their continuing development of their databases, were both "experiencing more than one 'cold hit' a week" by the year 2000.²⁹ These results can only be expected to improve as technological advances further develop the uses of DNA databases.

In California convicted violent criminals and sex offenders are required to submit biological samples to the state's DNA Data Bank, but these samples can only be used for comparison DNA evidence taken from crime scenes where the individual was already a suspect.³⁰ In Texas the DNA database is required to conform with the FBI's CODIS system and

contains samples from sex offenders, other violent criminals, or inmates forced by court order to submit a specimen.³¹ Louisiana requires a biological sample from individuals who have merely been arrested, not convicted, for sex offenses, and three other states have begun to take samples from juvenile sex offenders that can be used in investigations after the offenders are no longer minors.³²

The use of DNA databases is not exclusive to criminal investigations. In California, for example, a Missing Person Database has been established to collect the DNA of unidentified remains in the hope of future identifications.³³

However, these varied approaches to the use of DNA databases must be explored in conjunction with the case law, which often contains criminal events with facts similar to the violent circumstances in *Patterson*. The violent nature of the crimes in which DNA databases are employed, and the fact that these crimes would often lack a suspect without the help of DNA evidence, appears to influence courts' willingness to admit expert testimony regarding DNA.³⁴

III. THE IMPACT OF DNA DATABASES ON CONSTITUTIONAL AND FUNDAMENTAL RIGHTS

A. *Felons' Rights*

In his article on Fourth Amendment individual sovereignty, Professor Erik Luna states that “the strongest presumption of [constitutional] invalidity attaches to government searches and seizures of an individual’s body or home.”³⁵ The kind of evidence required to create and maintain a DNA database requires just such a “seizure” of bodily material, and this action is not always voluntary on the part of the “donor.” In addition to Fourth Amendment concerns, one overriding purpose of DNA databases—developing a means to discover suspects in crimes—may implicate the protection against self-incrimination that is provided by the Fifth Amendment.

A convicted felon who is required to surrender a biological sample in order to potentially link him to past or future crimes might well argue that he is being unconstitutionally forced to incriminate himself for crimes to which he has not admitted. At this time however, precedent exists to prevent the success of Fifth Amendment claims alleging that requiring DNA samples from inmates amounts to compulsory self-incrimination. The Ninth and Tenth Circuits have held that requiring DNA samples from inmates does not amount to compulsory self-incrimination because DNA samples are not testimonial in nature.³⁶

As a result of the establishment of DNA databases in all states, the courts have seen a wide variety of suits concerning the constitutionality of the state-imposed collection of samples for these databases. Most of these cases have involved Fourth Amendment challenges to the formulation of DNA databases, claiming that the protection against illegal searches and seizures provided by this amendment precludes the collection of bodily fluids like tissue, blood, or saliva.³⁷ The basis of some of these arguments might stem from *Davis v. Mississippi*.³⁸ In *Davis* the United States Supreme Court ruled that detention of an individual specifically for the purpose of obtaining that individual's fingerprints violated the Fourth Amendment, largely due to the fact that the police force made no efforts to conform to the Constitution.³⁹ Analogizing fingerprints to blood, tissue, or saliva is not difficult, but it depends on a misunderstanding of *Davis*, which specifically noted that government officials were not necessarily estopped from collecting fingerprints despite a lack of probable cause.⁴⁰ Certain narrowly tailored means for collecting samples might, in the Court's view, be allowed.⁴¹

Judges and scholars now join convicts in the argument that seizure of bodily samples implicates the Fourth Amendment. In *Ex Parte Hammonds*, Justice Johnstone of the Supreme Court of Alabama argued for restraint in Alabama's efforts to pursue its investigatory interests

regardless of the constitutional rights of defendants, stating that holding in favor of the state “defies the very concept of a constitutional protection, which is that it protects the defendant from certain specified state action even though the state may be pursuing a recognized state interest.”⁴²

Despite Justice Johnstone’s viewpoint, most courts find neither Fourth Amendment nor any other constitutional violation inherent in the mandatory collection of biological samples for the creation of DNA databases. In *Alfaro v. Terhune*, the California Court of Appeals noted that “DNA data base and data bank acts have been enacted in all 50 states as well as by the government Various constitutional challenges to these acts have been rejected consistently.”⁴³ The *Alfaro* court applied this precedent to their own rejection of the plaintiff’s constitutional claim. In Indiana, when the defendant in *Smith v. State* claimed that his DNA records had been “seized” in violation of the Fourth Amendment, the state Supreme Court contested the claim by stating that the defendant no longer “owne[d], control[led], possess[ed] or [held] interest in . . . the property seized,” because the samples, once taken, became the property of the state’s Crime Lab.⁴⁴ Because the defendant challenged the use of the samples, as opposed to the actual collection of the samples, the Court viewed his action as challenging the seizure of property that no longer belonged to him.⁴⁵

The constitutional attacks on DNA databases are largely motivated by the intimacy of the biological collections required to create these databases. Professor Smith argues, “Human DNA samples are different because they are body components that when seized, investigate beneath the caverns of the human realm, and, therefore, are not a limited intrusion.”⁴⁶ The very nature of the collection of DNA evidence assures that constitutional challenges will continue to be pursued, but the result of these challenges, if they follow the precedent established thus far, will

probably continue to fail in convincing courts to discontinue the mandatory collection of biological samples.

B. Other Individuals' Rights

The fundamental rights of the criminal are not the only rights at issue, however. The right of a victim or a victim's family to a conviction, to some closure or resolution to a brutal crime, is equally fundamental. The murder of Joyce Aldridge went unsolved for 11 years and unprosecuted for 13. As a result of his commission of another rape, Patterson fell under the provision of Section 19.2-310.2 of the Virginia Code and was forced to submit a biological sample. Without this provision, he might never have been revealed as the rapist and murderer responsible for Aldridge's death.

In addition to victims' rights, the right of society as a whole to the incarceration of violent felons must not be underestimated. DNA databases undeniably aid in this process by providing another means to investigate crimes and prosecute criminals. The fact that James Earl Patterson was incarcerated for another violent sexual assault at the time he admitted to the Aldridge murder, taken in combination with the Supreme Court of Virginia's agreement that Patterson constituted a continuing threat to society, underscores the important role DNA databases can play in protecting society from violent criminals.

IV. FUTURE EFFECTS OF DNA DATABASES

A. Future Uses

The future of DNA databases will depend largely on efforts to increase the efficiency of DNA analysis. The time-consuming nature of such analysis generally results in a "massive

backlog” of samples which require analysis at any given time.⁴⁷ In addition, the cost-effectiveness of DNA analysis will hopefully increase as the cost of technology decreases.⁴⁸ In 2000, the National Commission on the Future of DNA Evidence estimated a cost of twenty-two million dollars would be incurred simply by finishing the DNA analysis of only the samples which were backlogged at that time.⁴⁹

Several scholars have raised the possibility of a “universal database,” containing the DNA of all citizens.⁵⁰ A universal DNA database would presumably provide some benefits when conducting criminal investigations, determining the identity of murder victims, or preventing the kidnapping of citizens. However, the specter of a “Big Brother,” like that which was fictionally created by George Orwell in *1984*, might create enough of a public outcry that such a universal database would never pass legislative muster.

At any rate, the current rate of additions of samples to the already-existing DNA databases, run by all 50 states and the FBI, will doubtlessly continue to increase the economic and investigatory efficiency of DNA analysis. There is currently a “delicate balance” resulting from the “relationship of trust between the government and its citizens” in the current democracy.⁵¹ Hopefully, the interests of the government and citizenry in continuing this balance will prevent the misuse of DNA database technology.

B. Overall Impact

The impact of DNA databases on society as a whole will depend largely on their ability to deter crime. The failure of Fourth Amendment challenges to the collection of samples for DNA databases means that felons will continue to be required to submit genetic information that has the potential to implicate them in past or future crimes. That criminals may be increasingly

aware of this fact might arguably have a deterrent effect on their commission of future crimes. It is equally possible, however, that the type of serial criminals anticipated by this situation would be unlikely to be convinced to discontinue a life of crime merely for the possibility that their other crimes might be detected.

The greatest impact of DNA databases may largely come from its ability to solve previously unsolved crimes. Any type of biological substance—“saliva, skin cells, bone, teeth, tissue, urine, feces, and a host of other biological specimens” which may be discovered at the scene of a crime—can provide a source for DNA.⁵² The ready availability of DNA evidence at certain crime scenes will likely eventually result in an overall decrease of “unsolved mysteries.”

Despite this advantage, the implications for misuse of DNA technology are a source of concern, if not alarm. The possibility of a technologically-advanced police force vacuuming crime sites for skin cells and fallen hairs in order to match them with a central database of every citizen’s DNA, thus allowing them to detect the movements and actions of every person regardless of suspicion, has so far only appeared in Hollywood fabrications.⁵³ In most states DNA databases are currently only used to collect samples from persons already convicted of or incarcerated for various felonies.⁵⁴ However, DNA’s developing role in the identification of victims who cannot be identified with more traditional methods begs the question — how long will it be until a legislature proposes to create a universal DNA database, containing biological samples from all citizens?⁵⁵ Such a universal database may prove useful in certain respects — when investigating missing persons or kidnapping cases, for example, or identifying previously unknown deceased victims of violent crimes. The ramifications of misuse of such an important resource, however, would be staggering. Some critics of the increasing use of DNA argue, “The inherent danger to our conception of ourselves as a free and autonomous society requires that . . .

the creation of a universal database be vigorously opposed.”⁵⁶ In a society where an increasing amount of intimate information about an individual can be stored (and sometimes, too easily accessed) through the use of technology such as the Internet, the interests of privacy arguably caution against extending the use of our most fundamental selves — our genetic blueprint — too far.

V. CONCLUSION

The cases and articles discussed above present the increasing role of DNA databases in every state and at the federal level. While this new technology has previously unimaginable potential to serve and protect society, it also has the potential for as-yet unforeseen consequences for governments and their citizens. The potential for great advancement comes with the potential for great misuse.

When the Commonwealth executed James Earl Patterson in March of 2002, his death resulted from his confession to a brutal murder — a confession that was arguably prompted by the near irrefutability of DNA evidence. Such a result necessarily implies a balancing analysis. On one hand is the violent crime to which an innocent victim was subjected. On the other hand is the right of an individual to hold the integrity of their person sacrosanct, not subject to seizures of biological samples. Joyce Aldridge’s person was brutally violated. Does such a crime justify the constitutional debates which must necessarily arise when all felons are forced to surrender bodily samples? Is the loss of bodily sovereignty a necessary consequence of the commission of a crime, simply another step in the process of trial and conviction?

These questions underscore the importance of *Patterson v. Commonwealth* to the fields of Criminal and Constitutional Law, and their answers depend on the person or source consulted.

The impact of a case that resulted in the execution of a man on such comparatively new and constantly evolving scientific evidence as DNA cannot be overstated. The use of DNA databases is a double-edged sword, condemning some while exonerating others. Whether the possibility of increased justice, both for victims as well as for the wrongfully accused, is worth the possible constitutional sacrifices that arise when the State is allowed to intrude into bodily sovereignty is not a question that can be conclusively answered within the scope of this Note. It is a question that must be left to the courts and the legislature — and, no doubt, to the philosophers. One thing is certain. The issue of whether or not an individual can, or should, be put to death on the basis of a scientific advancement will continue to be vigorously debated.

¹ Paul E. Tracy & Vincent Morgan, *Big Brother and His Science Kit: DNA Databases for 21st Century Crime Control?*, 90 J. CRIM. L. & CRIMINOLOGY 635, 639 (2000).

² *Patterson v. Commonwealth*, 551 S.E.2d 332, 334 (Va. 2001).

³ *See infra* notes 7-10 and accompanying text. *See also* discussion *infra* Part II.A.

⁴ *Patterson*, 551 S.E.2d at 334. “[C]old hit” – a match with a DNA profile maintained by the Virginia DNA Data Bank.” *Id.*

⁵ *Id.*

⁶ *Id.* at 336.

⁷ Michelle Hibbert, *DNA Databanks: Law Enforcement’s Greatest Surveillance Tool?*, 34 WAKE FOREST L. REV. 767, 774 (1999).

⁸ VA. CODE ANN. § 19.2-310.2 (Michie 2000).

⁹ Hibbert, *supra* note 7, at 774.

¹⁰ Jerilyn Stanley, *DNA: Law Enforcement’s Miracle of Technology: The Missing Link to Truth and Justice*, 32 MCGEORGE L. REV. 601, 619 n.8 (2001).

¹¹ Tracy, *supra* note 1, at 640-41; *see also* Combined DNA Index System (CODIS) Home Page (providing information about CODIS and the National DNA Index System, including participating states and their statistics), at <http://www.fbi.gov/hq/lab/codis/index1.htm> (last modified Sept. 27, 2002).

¹² J. Clay Smith, Jr., *The Precarious Implications of DNA Profiling*, 55 U. PITT. L. REV. 865, 878 (1994).

¹³ § 19.2-310.2.

¹⁴ *Patterson v. Commonwealth*, 551 S.E.2d 332, 334 (Va. 2001).

¹⁵ *Id.* at 335.

¹⁶ VA. CODE ANN. § 19.2-327.1 (Michie 2001).

¹⁷ *Harvey v. Horan*, 278 F.3d 370 (4th Cir. 2002).

¹⁸ 42 U.S.C. § 1983 (1994).

¹⁹ *Harvey*, 278 F.3d at 374.

²⁰ *Id.* at 373.

²¹ “Any person convicted of a felony may . . . apply for a new scientific investigation of any human biological evidence related to the case . . . [if] (iii) the testing . . . may prove the convicted person’s actual innocence.” VA. CODE ANN. § 19.2-327.1 (Michie 2001).

²² *Harvey*, 278 F.3d at 373.

²³ *Id.* at 374.

²⁴ *Id.*

²⁵ *Id.* at 376.

²⁶ § 19.2-327.1.

²⁷ *Stanley*, *supra* note 10, at 619 n.8.

²⁸ *Tracy*, *supra* note 1, at 644.

²⁹ Rebecca Sasser Peterson, *DNA Databases: When Fear Goes Too Far*, 37 AM. CRIM. L. REV. 1219, 1227 (2000).

³⁰ *Stanley*, *supra* note 10, at 604.

³¹ *Tracy*, *supra* note 1, at 675. “The legislation creating Texas’ DNA database system was enacted in 1995.” *Id.*

³² Peterson, *supra* note 29, at 1225. Arizona, Kansas, and Oregon are the three states that require that certain juveniles submit samples.

³³ Stanley, *supra* note 10, at 607-08.

³⁴ See, e.g., State v. Hummert, 933 P.2d 1187, 1188, 1192-93 (Ariz. 1997) (explaining the *Frye* analysis as used to admit expert testimony, where defendant was on trial for “kidnapping, sexual assault, sexual abuse, and aggravated assault”); see also Darling v. State, 808 So.2d 145, 156-57 (Fla. 2002) (finding that a jury had substantial evidence of defendant’s guilt for rape and murder when examining “strong DNA evidence” in combination with the rest of the record).

³⁵ Erik G. Luna, *Sovereignty and Suspicion*, 48 DUKE L. J. 787, 840 (1999). Among these “searches and seizures,” Professor Luna includes the “collection of bodily fluids, and any other intrusion into the home or body.” *Id.* at 841. Professor Luna also notes that there are “three discrete exceptions to an otherwise irrebuttable presumption of unconstitutionality”: cases where an individual has consented to the seizure, or alternatively where the government has a reasonable suspicion against the individual, or lastly where the individual’s sovereignty violates the sovereignty of another person. *Id.* at 841-45.

³⁶ Bolling v. Romer, 101 F.3d 1336, 1340 (10th Cir. 1996) (holding Colorado statute requiring inmates convicted of offenses involving sexual assaults to provide DNA samples to the state before their release on parole not to compel self-incrimination in violation of Fifth Amendment); Rise v. State of Oregon, 59 F.3d 1556 (9th Cir. 1995)(upholding constitutionality of Oregon statute requiring all inmates convicted of murder or sex offenses, or certain related crimes, to submit DNA samples for inclusion in a data bank), *cert. denied*, 517 U.S. 1160 (1996).

³⁷ Other types of constitutional challenges have also been raised, however. In State v. Olivas, 856 P.2d 1076, 1087 (Wash. 1993), the defendants unsuccessfully urged the Court to hold that DNA databases, which at that time required samples only from criminals who were convicted of “sex offenses” or “violent offenses,” violated the standards of equal protection under the laws. In Arizona v. Youngblood, 488 U.S. 51, 57 (1988), the defendant unsuccessfully claimed in front of the United States Supreme Court that an Arizona police force had violated the defendant’s right of due process by their failure to preserve crime scene evidence which might have been submitted for biological analysis.

³⁸ 394 U.S. 721 (1969).

³⁹ *Id.* at 727.

⁴⁰ *Id.* at 728.

⁴¹ *Id.* at 727.

⁴² *Ex Parte Hammonds*, 777 So.2d 777, 779 (Ala. 2000) (Johnstone, J., dissenting).

⁴³ 120 Cal. Rptr. 2d 197, 207 (Cal. Ct. App. 2002)

⁴⁴ 744 N.E.2d 437, 440 (Ind. 2001)(quoting Peterson v. State, 674 N.E.2d 528, 534 (Ind.1996)).

⁴⁵ 744 N.E.2d 437, 439-40 (Ind. 2001).

⁴⁶ Smith, *supra* note 12, at 879.

⁴⁷ Tracy, *supra* note 1, at 643.

⁴⁸ *Id.* at 644.

⁴⁹ *Id.* at 664.

⁵⁰ *See, e.g.*, Tracy, *supra* note 1, at 671-72; Smith, *supra* note 12, at 881-84.

⁵¹ Peterson, *supra* note 29, at 1236.

⁵² Tracy, *supra* note 1, at 654.

⁵³ *See* GATTACA (Columbia Tristar 1997).

⁵⁴ *See, e.g.*, VA. CODE ANN. § 19.2-310.2 (Michie 2001).

⁵⁵ Professor Smith presents this possibility as inevitable in his article, arguing that “with the imminent operation of a criminal DNA database on the horizon, the privacy rights of all individuals could hang in the balance,” as a database containing “the DNA profile of each citizen” could conceivably be developed. Misuse of such a “universal” database is a very real possibility. Smith, *supra* note 12, at 881-82.

⁵⁶ Peterson, *supra* note 29, at 1238.