DNA and the Criminal Justice System: Consensus and Debate

David Lazer and Michelle N. Meyer

In the last decade, DNA analysis has become a mainstay of the criminal justice system—the gold standard for identification. Following Breyer's and Jasanoff's discussions of the role of deliberation in the integration of technology and society, this concluding chapter examines where we, as a society, have reached a consensus—or should—on the use of DNA in the justice system, and also points to the unsettled areas of debate in which there remains room for reasonable disagreement.

As Imwinkelried discusses in his chapter, DNA technology has been rapidly and fairly easily integrated into the courtroom; its integration into the pre- and post-trial areas has been slower and more complex. Nevertheless, some broad areas of agreement exist, or should exist, in these areas, including: that some level of post-conviction relief is warranted; and that some form of DNA databases are effective and appropriate investigatory tools. Beyond that broad

consensus, however, exists a sometimes vociferous debate about how extensive post-conviction and database programs should be, and the institutions and rules that should govern them. Below we first summarize the areas of consensus, and then analyze the remaining areas of disagreement. We conclude by discussing deeper questions at the nexus of law, science and society.

Areas of consensus

There are two broad areas of consensus. First, that DNA changes the meaning of time in the justice system. From this principle follow a number of subsidiary points: that evidence must be preserved; that there should be statutory criteria for post-conviction access and review of evidence; and that statutes of limitation should be increased or abolished. The second area of consensus is that DNA databases—in some form, at least—are legitimate and effective investigatory tools.

DNA changes the meaning of time for justice

As Imwinkelried and Berger both demonstrate, time has been deeply programmed into justice—both pre-

conviction, with respect to statutes of limitation, and post-conviction, in limitations on bringing new evidence to bear. DNA has undermined this fundamental tenet of the justice system, and a consensus has developed that the rules of the system must be altered to reflect this.

Few individuals oppose the principle that unambiguous evidence of innocence should be grounds for exoneration. (The extent of this consensus can be illustrated by an exception to the rule: As assistant state attorney general Frank A. Jung tried to block a death row inmate from having his conviction reopened on the basis of new evidence, Missouri Supreme Court Judge Laura Denvir Stith asked him, "Are you suggesting that even if we find Mr. Amrine is actually innocent, he should be executed?" Jung answered, "That's correct, your honor." Judge Michael A. Wolff asked again: "To make sure we are clear on this, if we find in a particular case that DNA evidence absolutely excludes somebody as the murderer, then we must execute them anyway if we can't find an underlying constitutional violation at their trial?" Again, Jung said yes.[1])

Instead, viewing the original judgment as final has traditionally been thought to foster trust in the

system, and allow all participants in crimes, especially the victims, to gain closure. Moreover, most evidence deteriorates over time. Old evidence, even if newly discovered, is likely to be less reliable. And new evidence would be unfairly compared against the old, deteriorated evidence in the original record, putting the prosecution at a disadvantage. In addition, one piece of new evidence, whether deteriorated or not, typically cannot alter the balance of evidence against the defendant; reopening a case with every newly found piece of evidence would be unproductive and needlessly disruptive. Finally, limitations on prosecution and post-conviction relief, as well as the principle of double jeopardy, encourage counsel to try their case correctly the first time by investigating any evidence while it is fresh and offering such evidence at the original trial.

Yet the 128 (as of June, 2003) DNA-based post-conviction exonerations have fundamentally changed the terms of the debate about finality and the criminal justice system. On reflection, most agree that DNA constitutes an exception to the principle of finalty. As both Imwinkelried and Berger note, DNA is unique among identifying evidence in both its durability and

its degree of reliability. DNA's degree of certainty is so high that under some circumstances it is likely to outweigh all other evidence in the original record. And although the system should not be structured so as to encourage sloppy cousel, in many cases, DNA testing was not discoverable at the time of trial because the technology did not exist. Even in more recent cases in which the defense could, with due diligence, have discovered exculpatory DNA evidence, it seems unjust to punish a potentially innocent convict for the errors of his lawyer. Finally, there is little evidence that increased access to post-conviction testing would drain resources from the criminal justice system. In those states that have enacted post-conviction statutes, relatively few convicts have requested testing,[2] and exonerations actually save the state money, since housing an inmate costs anywhere from $16,000 to $25,000 annually, while testing costs from $50 per case to $5,000, including materials and personnel costs.[3]

From the principle that DNA constitutes a legitimate exception to the rule of finality follow two corollaries: that evidence from old cases must be preserved and categorized; and that there must be an established, fair, and timely mechanism for negotiating

requests for access to evidence and post-conviction review.

Evidence must be preserved

Any policy debate over how to manage inmate access to DNA testing must logically assume that the evidence to be tested exists and is locatable. Yet in many cases, such evidence has been lost, destroyed, contaminated, or allowed to deteriorate. In seventy-five percent of the cases where the Innocence Project has determined that a DNA test on some piece of biological evidence would be determinative of guilt or innocence, the evidence is reported either lost or destroyed;[4] overall, adequate DNA material is available in only one in five felony cases.[5] Police and prosecutors in each jurisdiction have their own policies for managing and disposing of the evidence that they retain after investigations and trials. The obvious policy solution to this problem is the enactment of laws that ensure the proper management of physical evidence. The central concern about this solution is the logistics of storing all evidence indefinitely. Compromise policies thus might make distinctions among the types of evidence to

be preserved, and/or the length of its required preservation.[6]

Negotiating access and post-conviction review

Assuming that the evidence is available, the most basic—and often most difficult—obstacle that inmates face is obtaining physical access to the evidence. The most basic policy questions, in turn, are: who controls this physical access, and by what criteria do these gatekeepers grant or deny access? Currently, the answers to these questions for any individual convict depend on whether he is imprisoned in a state with a statute that specifically addresses post-conviction testing, or not.[7]

About one-third of all states currently lack statutes that provide a procedural mechanism for addressing convict requests for post-conviction testing. Convicts in these states must choose one of three options: (1) appealing informally to police and prosecutors; (2) appealing to elected officials for clemency; or (3) litigating before a judge for the right to test (often claiming newly discovered evidence).

The experience to date suggests unambiguously that each of these routes is deeply flawed, and that the odds that a given convict will be granted access to evidence by one of them are slim. Regardless of which route they choose, for instance, convict requests for DNA testing typically occur in a post-conviction relief setting in which they have no right to the legal representation necessary to search for physical evidence or apply for the permission to test and/or for a new trial.[8]

The current policy is that police departments effectively "own" evidence not used at trial, while prosecutors "own" evidence used at trial. A convict's first step, then, is often, through his counsel (if he has any), to informally ask the prosecutor of his case for permission to test evidence. Yet relying on prosecutorial discretion is asking an institution designed for one purpose—to make the case against someone suspected of a crime—to perform exactly the opposite function. Post-conviction cases divert resources from the primary organizational mission of convicting criminals, and undermine the credibility of the office. They also threaten existing relationships with law enforcement, and do not achieve the political

imperative of being tough on crime—costs that governors, to whom convicts might appeal for clemency,[9] share with prosecutors. While individual prosecutors and elected officials sometimes rise above these institutional pressures, the experience to date (the Criner case discussed in the introductory chapter is an exemplar) indicates that it is unreasonable to ask prosecutors as a class to take on this function.

If appealing to individual prosecutors[10] or other elected officials fails, convicts imprisoned in states without post-conviction statutes might attempt the third option of litigation. The Innocence Project claims that those who do face an average delay of 4.5 years in obtaining access to evidence, increasing the likelihood that the evidence will be lost or destroyed.[11] Moreover, convicts are faced with the daunting task of forcing the square peg of potentially exculpatory DNA evidence into the round hole of existing rules governing post-conviction relief. Because no clear precedent regarding post-conviction DNA testing exists in states without specific statutes, courts, no less than prosecutors and governors, tend to rule on a case-by-case basis, and do not always create consistent rulings within states, much less among them.

Moreover, many judges, too, face reelection by a public that often expects them to demonstrate their commitment to punishing crime. Finally, and perhaps most importantly, convicts face various time restrictions. In thirty-three states, for instance, inmates have six months or less to file a motion based on new evidence.[12] Convicts also face a recent trend of states enacting statutes of limitations that bar post-conviction relief for any reason. The number of states with such statutes has increased from three, in 1972, to twenty-eight, as of 2002.[13] Only fifteen states permit a convicted felon to request a motion for a new trial based on newly discovered evidence more than three years after judgment in the case. In the absence of state statutes that permit specific exceptions to these limitations for DNA-based cases, those convicted either prior to the introduction and/or admissibility of DNA evidence, or before advancements in the scientific analysis of DNA, are "procedurally barred" from receiving post-conviction relief.[14]

Given the flaws in each of these three alternatives, it is clear that some mechanism must be established that is designed especially for negotiating access to evidence and post-conviction review. One

option is for states to enact statutes that permit testing in certain situations when convicts request it. At the time of this writing, 30 states have enacted specific statutes to address convict access to post-conviction DNA testing, up from only 2 states in 1999;[15] another 8 states have legislation pending. By taking decisions about who should have access to evidence out of the hands of individual DAs, these laws, in theory, provide a less arbitrary, more effective standard for negotiating post-conviction access to evidence. Indeed, in 2000, most exonerations came from New York and Illinois, the only two states that had enacted such statutes at that time.[16]

Yet state statutes vary widely in their criteria for granting post-conviction review (see below), such that the most narrow statutes arguably provide no better access than the avenues just discussed that are used by convicts in states without statutes. Another option, then, is to enact a single, federal statute with the effect of forcing sufficient convict access at the state level.[17] Denying an individual access to potentially exculpatory evidence is arguably unconstitutional—nothing short of a civil rights violation; from this perspective, post-conviction

testing (at least in some circumstances) is a fundamental right that should trump something as arbitrary as the state in which that individual happens to have been convicted.[18] Another argument in favor of federal legislation harkens back to the flaws of allowing individual prosecutors to determine whether to grant review. Just as prosecutors have an interest in avoiding a critique of their own work and that of their colleagues in law enforcement, individual state legislatures (which are often composed of many former prosecutors) arguably have similar interests in appearing tough on crime and in conveying an image of their state law enforcement as competent.

Statutes of limitations must be adjusted to take into account DNA evidence

The logic for supporting extensions on prosecutorial statutes of limitations is identical to the logic for increasing the time permitted to apply for post-conviction relief: DNA evidence can be powerfully probative many years after a crime. DNA can identify a perpetrator (or exclude a convict) with a high degree of probability that, in turn, effectively removes the

doubt that ordinarily surrounds the prosecution of an old crime. There has even been serious contemplation abroad of making exceptions to the rule of double jeopardy in cases of new DNA evidence.[19]

DNA databases are an effective investigative tool

Experience in the U.K. and the U.S. indicates unambiguously that DNA databases are an effective investigative tool, having aided many thousands of investigations. In the U.K., the Forensic Science Service (F.S.S.) reports that approximately one in ten adult males are now in the database, and that there is a 40 percent chance that probative biological evidence from any given crime scene will result in a hit to the database.[20] In the U.S., all 50 states have passed statutes authorizing the creation of DNA databases, and, while the fraction of the population that is in the database is considerably smaller than the U.K., that number is rapidly growing.

Areas of disagreement

As we move from broad principles regarding whether DNA should be used in certain ways in the criminal justice system, to the specifics of how DNA should be governed, consensus moves to disagreement. The first set of questions focuses on the design of post-conviction institutions: Who should be gatekeepers of post-conviction review? What should the criteria for post-conviction relief be? How should the system respond when the results from post-conviction testing return? And are there systemic flaws in the criminal justice system, and if so, how should we address them? The second set of questions focus on the DNA databases: Who should be in the database? Should the database be searched for "near misses"? How should the database be regulated?

Disagreements in the area of post-conviction review

Who should be the gatekeepers of post-conviction review?

There is considerable variation among states in which parties play the role of the gatekeepers of post-conviction review. In states without post-conviction

statutes, individual prosecutors, governors, and judges act as the gatekeepers of post-conviction review. In states that have enacted statutes, state legislators who create the relevant law, combined with the judges who interpret and apply it, act as gatekeepers. A third option is to create commissions that are independent of the criminal justice system to review cases for possible testing. Instead of petitioning a judge under a statute, for instance, convicts might seek permission to test from a DNA panel whose members represent a variety of interests (e.g., prosecutors, defense lawyers, victims' rights advocates). All of the above options rely on individual convicts to initiate the process of review. Placing the burden on the convict is probably both sufficient and efficient in most cases; some convicts who lack education or who have significant intellectual deficits, however, might fall through the cracks. A final option, then, used in conjunction with one of the above, is to establish a mechanism—perhaps independent committees—by which society reviews convictions.

What should the criteria for post-conviction review be?

As Berger highlights in her chapter, a second set of policy decisions concerns the *criteria* that these gatekeepers—whoever they are—ought to use in determining who is given access to evidence. Existing state statutes provide a good starting point for exploring the range of policy options on who should be granted access. The first step in gaining access to post-conviction DNA testing under a state statute is to qualify as a petitioner. By setting various standards for who qualifies as a legitimate petitioner, states reasonably seek to control the number of requests with which the system must deal,[21] and in particular to discourage frivolous requests that waste resources and needlessly subject victims to painful memories. For example, must the conviction in question be of a certain kind? Although state positions on this question range from no restriction[22] to permitting testing only for those sentenced to death,[23] the most common position among state statutes is to grant testing only to prisoners who were convicted of a felony.[24] Similarly, must the petitioner have received a sentence of a certain length? Again, some states have no sentence requirements,[25] while others limit testing to those

sentenced to life or even death.[26] While these conviction and sentence limitations are successful in stemming the flow of post-conviction requests, they have the significant disadvantage of possessing no relationship to the ethical or legal merits of review. An innocent person who is sentenced to fifteen years for a lesser crime is just as wrongfully imprisoned as one sentenced to life for murder.

Should post-conviction statutes be subject to statutes of limitations? Some statutes require that the petition be filed by a certain time after conviction or sentencing.[27] Others establish an expiration date after which the statute will no longer exist.[28] Still others restrict review to cases in which convictions were entered before a certain time (usually the mid-1990s, when DNA evidence became a routine presence in the courtroom).[29] On the one hand, such restrictions successfully limit the number of potentially reviewable cases by attempting to isolate those that are most likely to have been mishandled and/or to benefit from DNA analysis. On the other hand, they tend to assume a limited cause of wrongful conviction (e.g., prior unavailability of DNA testing), such that a brief window of review will suffice to identify and correct

all wrongful convictions. Yet these restrictions would exclude a variety of cases of potential wrongful conviction, such as those in which the evidence to be tested took years to locate, or in which DNA testing was available during trial but not pursued due to incompetent defense council, or in which there was false or purposefully deceptive testimony. Moreover, new technologies are on the horizon that will play an analogous role to that of DNA; mtDNA analysis, for instance, is likely to produce a second wave of post-conviction cases by questioning convictions based largely on hair analysis.

Finally, should the convict have consistently maintained his innocence, and should he have been convicted as a result of a guilty verdict at trial, rather than by entering a plea of guilty or *nolo contendere*? While this criterion prevents potential frivolous petitions, it would also have excluded from review several of the men that have now been exonerated but who "confessed" to various crimes, or plead guilty as part of a plea bargain.

After setting the criteria for defining a legitimate petitioner, statutes determine how a convict must show a credible *prima facie* case that DNA testing

is potentially exonerative. Here, states almost unanimously agree that the evidence in question must have been subject to a demonstrable chain of custody, but disagree significantly on nearly every other matter. They are divided, first, on what role the "identity" of the alleged perpetrator of the crime should play in assessing a convict's request, and most either require such a showing or not. Those that require a showing argue that if the original trial turned on questions of the victim's or accused's state of mind, for instance, a DNA test would be irrelevant.

More controversial are crimes in which multiple persons may have participated. Some argue that whenever there were multiple perpetrators, or it is uncertain whether the rapist ejaculated or the victim had consensual sex prior to being raped, the absence of the appellant's DNA at the crime scene is meaningless.[30] Others counter that if two rapists were involved, for instance, and DNA tests revealed the presence of two individuals, neither of whom is the defendant, than the test is exculpatory. Similarly, results could be suggestive, if not definitive, if the DNA matched a known criminal in the DNA database. Others note that in some cases, identity should have been an issue at

trial, but was not, perhaps because eyewitness testimony seemed definitive.[31] California accommodates this concern by requiring prisoners to show "why the identity of the perpetrator was, *or should have been*, a significant issue in the case."[32]

In part, these different approaches to the question of identity reflect different approaches to a second question, that of the required standard of proof.[33] Those statutes that do not require a showing that identity was at issue during trial, for example, often do not require that test results demonstrate actual innocence, but rather only that "a reasonable probability exists that the petitioner would not have been prosecuted or convicted if exculpatory results had been obtained through DNA analysis."[34] An even weaker standard of proof is that first established in 1994 by New York's statute, which denies a petitioner who fails to show that "if the results had been admitted in the trial resulting in the judgment, there exists a reasonable probability that the verdict would have been more favorable to the defendant."[35] Other states distinguish between the reasonable probability of a more favorable verdict or sentence and the reasonable probability that the petitioner would not have been

prosecuted or convicted.[36] The strongest standards, on the other hand, require that results prove actual innocence. Slightly less strong is the requirement that the results could significantly advance the convict's claim of actual innocence—in other words, that they could raise a reasonable probability that the convict is actually innocent.[37]

What should happen when the DNA results come back?

The next set of policy decisions concerns what happens when the results from a DNA test are returned. When results are not exculpatory, for instance, what should be done? Ought only the original conviction stand, or ought we to criminalize convict requests for tests that turn out to confirm guilt?[38] Conversely, when results are exculpatory, what should happen? Although relief is the clear goal of those who pursue post-conviction testing, some state statutes enacted expressly for the purpose of negotiating this testing nevertheless fail to specify the remedy for exculpatory results.[39] Currently, in some cases, the defense moves for a new trial, the prosecutors decline to re-try the case, and the defendant is released. In others, prosecutors

decide to pursue a second trial.[40] Or should courts have the authority to vacate a judgment, as is the case in New York?[41]

> Are there systemic flaws in the criminal justice system, and if so, what should be done about it?

The Innocence Project claims that in 50 percent of their cases in which evidence exists and is tested, the results exonerate the convict[42]—a rate that does not match the criterion of "beyond a shadow of a doubt." This suggests that the Innocence Project's criteria for selecting cases to review are picking up on systematic weaknesses of the criminal justice system. They claim, for instance, that a significant percentage of their exonerations involve incompetent defense lawyers; police or prosecutorial misconduct, such as manipulation of confessions and the withholding of key evidence from the defence; unreliable testimony from "jailhouse snitches;" juror reliance on questionable eyewitness testimony and expert testimony on serology and hair analysis; and false confessions.[43] They also claim that the wrongly convicted are disproportionately

poor and black, even when compared with the prison population as a whole.[44]

If the criminal justice system does make *systematic* errors, then DNA technology is a woefully inadequate after-the-fact fix that has the potential to correct only the relatively small fraction of cases in which testable evidence is available. There are three reasons why DNA is an inadequate fix. First, most crimes, other than rape, do not have DNA evidence that is so compelling as to prove innocence or guilt. Assuming that any systematic errors exist just as often for these cases where there is no compelling DNA evidence, the 100-plus exonerations represent simply the tip of the iceberg of when the system failed. Second, for most crimes that were committed before the common use of DNA analysis, the evidence has been discarded. There are almost certainly innocent people in jail convicted of crimes where DNA evidence that might have exonerated them was discarded or misplaced. Third, if the system makes systematic errors, those systematic biases certainly still exist even in cases where DNA evidence is used. As Bieber notes, the most DNA technology can do is reliably match two samples. It is up to the prosecution and defense to construct

competing narratives as to why two samples do or do not match, and up to judges and juries to weigh those competing narratives. If there is a flaw in any step of the process, the system will make mistakes, no matter what technology it uses.

Thus, while exonerating over 100 convicts is tremendously important, the illumination of systematic errors in the criminal justice system is more important. It would be misguided of our society to view this period of DNA exonerations as a temporary aberration, and ignore the larger lessons that these experiences potentially have to offer us. The illumination of any systematic errors would create the possibilities of (1) opening up other old cases based on those errors; and (2) correcting these errors as we move forward. Systematic evaluation of fault lines in the system have occurred to a limited extent: for example, the National Institute of Justice report, *Convicted by Juries, Exonerated by Science*,[45] examined some of the common denominators in 28 wrongful convictions; in Canada, the Ontario government did a thorough self-examination of its system after DNA revealed the wrongful conviction of Guy Paul Morin (the Morin commission);[46] in the U.K., England has created a

standing commission to re-evaluate cases post-conviction (the Criminal Cases Review Commission).[47]

These efforts at self-reflection have had an impact: for example, New Jersey recently changed how it conducts photo lineups based on a combination of cognitive psychological studies about accurate recalls, and in part based on the NIJ report.[48] A few states attempt to ensure fair questioning of suspects by videotaping interrogations, including any confessions that may occur during them.[49] The series of post-conviction exonerations have also changed the terms of the debate around capital punishment. While the presence of systematic errors in the criminal justice system is a concern at all levels of severity of crime, the finality of the death penalty removes the possibility of post-conviction correction. The exonerations of inmates on death row, as well studies that indicate a substantial error rate in the handling of capital cases,[50] certainly undermine the case for capital punishment, especially in the absence of repairs to the system. It is this set of reasons that led Governor Ryan of Illinois and Maryland Governor Parris Glendenning to place a moratorium on capital punishment, and later led Ryan to commute the sentences

of all 167 inmates that remained on death row in his state.[51]

However, so far, the impact of these efforts has been quite limited, and a critical question that needs to be addressed is how to use the information that exonerations provide to improve the justice system. Should there be a standing commission, as in the U.K.? Or, alternatively, as Scheck has proposed, should there be a blue-ribbon commission along the lines of the Morin commission every time there is an exoneration?[52]

The possibility of systemic flaws in the system also raises another question about the criteria for post-conviction review: Should post-conviction review be limited to DNA-based cases? On the one hand, again, there is a need to limit the scope of potential cases that can be reviewed. Yet there is no reason to think that the errors (and intentional misconduct) that lead to wrongful convictions are limited to those cases in which DNA testing is possible, and such a restriction would make most of these other cases unreviewable.

In addition to increasing access to post-conviction review and forming commissions to study systemic patterns of error, it is arguable that DNA databanks, while established with the primary end of

prosecution, will also help exonerate the wrongfully convicted as well as prevent wrongful convictions in the first place. When DNA samples from a crime scene not only fail to match the convict, but instead match a known offender, a convict's case for post-conviction relief is that much stronger. Similarly, as crime scene samples achieve immediate cold hits, police and prosecutors will be diverted from attention they might otherwise have paid to innocent suspects. These effects presumably increasingly accrue as the database grows.[53] It is to the policy issues that concern this other broad use of DNA in the criminal justice system that we now turn.

Disagreements in the area of DNA databases

Who should be in the database?

Recent years have seen a clear trend toward expanding the criteria for inclusion in DNA databases. Two main factors have driven this trend: the economics of the database and lessons learned from the leaders in the development of convict databases. The economics of the database are simple: once the system is in place,

adding individuals to the database is cheap—the cost of processing a sample is approximately $50-100.[54] Convict samples can also be outsourced efficiently, as compared to casework, because the convict samples are standardized.

The lesson that has been learned from early adopters of DNA technology—the U.K., Florida, and Virginia—is that a bigger offender database is much more effective than a smaller database. That is, for example, Florida and Virginia now claim that most of their convict to case cold hits now involve convicts who have only been convicted of property crimes. As a result, there has been a national move toward all-felon databases. There is also an incipient move toward including arrestees for included crimes in the database (e.g., Virginia and Louisiana), as well as cases where exclusion samples collected from suspects (sometimes relatives and friends of the victim) are searched against the database.[55] Finally, there is substantial disagreement over whether juveniles should be included in the database: should an individual be under lifetime surveillance because of something they did as a minor? Table 16.1 summarizes the criteria for inclusion in the database across the 50 states.

Table 16.1 here

It is important to note, however, that there have been no independent evaluations of the relationship between scope of the criteria for inclusion and efficiency of the database.

The scope of inclusion in significant part must be based on interpretations of the scope of intrusion of the collection of a DNA sample from an individual. Jasanoff, in the concluding chapter in this volume, argues that DNA has an "identity crisis." The critical question as we move forward with DNA databases is how we view what these DNA samples "really" are. At a minimum, DNA is an identifier, and, due to the fact that we shed our DNA, a tool for surveillance. It allows the matching of biological samples collected from some location (e.g. a crime scene) to an individual. The critical questions are: what individuals and what locations? As discussed above, there is great variation in the choices of states along these dimensions. The critical issue from a privacy perspective is what justifies this level of state surveillance of an individual? For instance, if DNA

molecules are viewed as miniature medical records, then the very databank of tissue samples is essentially a database of intimate details regarding the individuals whose tissue is in the databank, awaiting the appropriate technology to be applied to withdraw that information. Under this view, the holding of DNA by the state becomes a substantial intrusion on the individual.

In this volume, Steinhardt would assert that the set of people whom it is justifiable to monitor in this fashion is very small—that inclusion in the database should be limited to those committed by the most egregious crimes (and, preferably, not even them). Mayer-Schoenberger and Etzioni, with very different emphases, argue that a balancing of individual rights and societal interests is necessary, with Mayer-Schoenberger emphasizing the former, and Etzioni the latter. Kaye and Smith, finally, argue that there is no individual right against *just* identification by society, and that therefore there is no logical limit on who should be included in DNA databases.

> Should the offender database be searched for "near misses"?

DNA also may reveal who an individual is related to, especially parent-child and full sibling relationships. In principle, a database may be searched to examine who is related to whom, as well as used to examine who is not related to whom. This is a particular challenge for the possibility of a universal database, as Kaye and Smith advocate in this volume.[56] It would be possible to use such a database to find out whether some individual had any "unreported" children, or to trace whether "reported" children were, in fact, genetically related.[57]

The fact that DNA may be used to identify close relatives is relevant not just when both individuals are in the *offender* database. DNA may be used to identify whether someone in the offender database is related to the individual who was the source of DNA from the crime scene half of the database. This will be the single biggest challenge to the development of the DNA databases over the coming decade. As Bieber discusses in chapter 2 of this volume, one can currently conduct a "low-stringency" search of the offender database that would, with rather high probability, result in matches of siblings, parents,

and children of a convict. In the future it might be possible to develop less discriminating tests based on Y chromosome loci and mtDNA sequences that would reveal potential distant relatives of a convict. In fact, this indirect approach has been done on a rather large scale in identifying remains from the World Trade Center after September 11, 2001 (as well as on other mass disasters): where a database was set up with DNA of close relatives of victims to produce matches through low-stringency searches.

While a partial profile "match" may not be precise enough to use in court, since it might result in multiple matches, from an investigative perspective, narrowing the list of suspects down to handful of individuals, one of whom the investigator is nearly certain is the perpetrator, may be almost as good as a direct hit. That is, close relatives of someone in the database will be under almost as much surveillance as the individual in the database—especially if such a low-stringency hit could be the legal basis for getting a DNA sample from this small set of people. It is not difficult to imagine scenarios under which it would be irresistible, and perhaps unconscionable, not to search a database in this fashion in the case of a murder or a

rape with biological evidence that would likely be linked to the murderer.

However, it is notable that the number of people "indirectly" in the database because they are closely related to someone who is in the database is potentially much larger than the number of offenders in the database. The potential efficacy of low-stringency searches is also accentuated to the extent that those convicted of crimes are related to each other at a rate greater than chance, as a recent Department of Justice study suggests.[58] Low-stringency searches would also multiply the uneven coverage of the DNA database across demographic groups. For example, each year approximately 1.2 percent of the African American population is convicted of a felony (as compared to .25 percent of Caucasians).[59] A calculation of the percentage of African Americans who would either be directly or indirectly be "in the database" would require detailed and unavailable knowledge of the total number of living offenders, as well as the relationship between offenses and familial ties—but it is certainly conceivable that *most* African Americans would either directly or indirectly be in the database if very low-stringency searches were done.

Finally, such searches might create the peculiar situation in which the database yields a low-stringency "hit" of an offender who could not possibly have committed the crime—for example, in an extreme case, because the offender had died years earlier (there are few if any provisions in state database laws to expunge from databases data from deceased convicts). That is, a convict's genes might continue to implicate his close relatives for many years after his death.

While the architecture of CODIS allows low-stringency searches—all it would require is a little time to develop the appropriate search algorithm and the patience to wait a few extra seconds for a more time-consuming search—the FBI has not set standards for low-stringency searches of CODIS, and no state database laws have set policy with respect to whether such searches should be done. The legal and policy question is what is the basis for low-stringency searches (as Breyer mentions in the preface to this volume).

Low-stringency searches pose ethical, legal, and political challenges to the development of the database. If the theory underlying the DNA databases is that convicts forfeit certain rights, as Etzioni argues in this volume, then if low-stringency searches

similarly and systematically and exclusively infringe on the rights of individuals who have not forfeited those rights, low-stringency searches should not be done.

If, on the other hand, if inclusion (and de facto intrusion) in the database is *not* an intrusion on an individual's rights, and the rationale for inclusion of convicts is that recidivism makes it cost effective to include them; the rationale for doing low-stringency searches for matches against crime scene evidence would be that the cost is essentially zero. Such an "opportunistic" logic, as the cost of typing samples drops toward zero, however, could also support typing any easily available databanks of genetic material (indeed, there was a recent proposal in Congress to create a database from the samples collected from the military for crime fighting).

This logic, as Kaye and Smith argue in this volume, potentially leads to a universal database. The costs of creating such a database would not be large, and are likely to drop substantially in coming years. The benefits are easily quantifiable: the percentage of cases in Florida, with one of the most comprehensive databases in the country, which result in "cold hits"

is 25-50 percent.[60] With a universal database, this number would (theoretically) approach 100 percent.

Low-stringency searches thus pose a distinctive mix of ethical, legal, and political challenges for the growth of DNA databases. Notably, none of the state or federal statutes dealing with DNA databases deal with low-stringency searches. The political logic underlying the expansion of DNA databases is simple: they are effective at catching criminals, and they largely impinge on the rights of offenders. As a general matter, few state legislators have lost office voting for legislation that embodies these values—hence the fact that all 50 states have passed database legislation. The inclusion of arrestees and suspects in the database erodes the political premise of database legislation to a limited extent—but the wholesale inclusion, directly or indirectly, of millions of non-convicts means that the rights of non-convicts/non-arrestees/non-suspects must weighed against public safety

There are four distinct paths we might go down: first, that we only include individuals convicted of certain crimes in the DNA database and only conduct high-stringency searches of the database; second, that

we include only those individuals, but conduct low-stringency searches of the database; third, that we opportunistically search any database that is available; fourth, that we develop a universal database. If some limits are required on low-stringency searches, the database will require some level of regulation, the next question that we visit.

How should the database be regulated?

As noted above, part of the question around scope the DNA database turns on the question of how intrusive being in the database is. There is, in fact, substantial potential for intrusion beyond the objective of surveillance. There will be an increasing amount that genes will be able to reveal about an individual, most notably the likelihood of getting certain diseases, and perhaps the likelihood of certain behaviors (see below). Annas, in this volume, likens the DNA molecule to a miniature medical record about an individual that requires special protection. In fact, as Charo discusses, there have developed (and are still developing) very rigorous protocols on informing individuals participating in federally funded research

and on protecting information collected from individuals. The collection of convict samples generally do not involve either providing information about possible uses of the DNA material (other than for matching against crime scenes) or consent of convicts.[61] These protocols have not been applied to the convict samples collected for CODIS, and state statutes vary enormously in their internal regulation of the DNA samples they collect. Thus, some states prohibit research on the samples, while others allow just anonymous research on population statistics, while yet others (such as Alabama) mandate research "to assist in other humanitarian endeavors, including but not limited to educational research or medical research or development."

DNA also provides information about individuals someone is genetically tied to who are not in the database. Following from the preceding section, information uncovered about an individual's tendency to get some disease also conveys information about the tendency of that individual's relatives. For example, if an individual has the abnormal allele for Huntington's disease, there is a 50 percent chance that each of that individual's full siblings has the allele,

and a 100 percent chance that at least one of that person's biological parents has the marker.

The critical question that we are left with is what "privacy protections" are necessary for CODIS. There are several distinct possible paths. First, that research be allowed on the samples if identities can be reasonably cloaked. Second, that an informed consent protocol be developed for convicts, where they either consent or do not consent for their tissue samples being used for research. Third (Etzioni), that no research be conducted on the samples, but that the samples be retained (e.g., for quality assurance purposes). Fourth (Steinhardt, Mayer-Schoenberger), that once the information from the 13 loci is extracted, the samples be destroyed.

In each case, part of the question is the construction of a regulatory regime to guard the integrity of the data collected. How easily should data in the database be accessed and by whom? What punishments should meted out if the data are improperly accessed? Should DNA samples be discarded or retained? These are questions that have, at best, been incompletely addressed by the various state statutes authorizing the creation of offender databases.

Questions at the nexus of law, science, and society

The most obvious role of science in the criminal justice system is in the area of forensics. What is less clear is how forensic science should be organizationally positioned within the criminal justice system. In most U.S. states, forensic DNA tests are conducted by state-, county-, or city-run crime labs. This is in stark contrast to the U.K., for example, where the F.S.S. is independent of law enforcement. This institutional configuration raises several interrelated concerns, the first of which is that these labs are usually dependent on and controlled by the law enforcement community, which has a vested interest in the lab results. This concern is reinforced by the drumbeat of cases in recent years of crime lab errors, where the vast majority of those errors seem to favor the prosecution.[62] Although these actual cases of bias are surely the exception to the rule, they, combined with the organizational dependency of forensic science on law enforcement, produce an additional *perception* of bias, which is itself harmful in undermining public

confidence in the criminal justice system and in the science of DNA analysis.

Anecdotal evidence suggests that unintentional error is also a factor in some forensic cases.[63] Many forensic techniques used by the criminal justice system—including fingerprint analysis, hair and fiber analysis, and analysis of eyewitness testimony—are essentially scientific in nature. Yet they have never sustained the same level of scientific scrutiny as DNA analysis. While these cases of misconduct and error have often been uncovered due to the application of DNA analysis post conviction, DNA analysts themselves have not been immune from either errors or accusations of pro-prosecution biases.[64]

Although the defense has an opportunity at trial to present evidence of either intentional bias or unintentional error, reliance on the adversarial process is problematic. This is so, in part, because the defense often does not have the resources to effectively challenge the state's experts, whose imprimatur can be powerfully persuasive to juries. Further, there have been severe limits placed on defendants seeking discovery of testing data which might then allow them to challenge either the

admissibility of the results in a pretrial hearing or, failing that, its weight during trial. Crime labs, however, have resisted discovery, often successfully.[65]

These cases of bias and error raise the issue of whether the relationship between law enforcement and science needs to be re-engineered, somehow insulating labs from the law enforcement community and its interests by bringing forensics more squarely within the scientific community. In such a scenario, all forensic labs would be completely independent of both the prosecution and the defense, and both sides would have equal access to the lab's process of data analysis. That process, furthermore, would be subject to stronger regulation and oversight than is currently in place. For instance, accreditation by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board should be mandatory for all forensic labs, not voluntary, as is currently the case.

Science has other crucial roles to play in the criminal justice system beyond forensics. For instance, researchers who are impartial and free from conflicts of interest can contribute helpfully to the debates discussed in this volume by providing independent empirical research about the criminal justice system.

Indeed, as noted above, it has already done so in the form of various reports on exonerations and psychological studies of eyewitness testimony. More such empirical studies are needed. While the policy issues we face concern questions of values, these ethical questions, in turn, often depend, in part, on empirical data. The legitimacy of expanding the databases, for instance, hinges on their effectiveness in punishing and preventing crime—a value that must be balanced against others, such as individual privacy. As noted earlier, however, no independent data exist on the extent to which expanding the database from, say, some felons to all felons, or from felons to arrestees, results in an increase in identifying suspects through cold hits.

Similarly, there are no data on how many suspects who are identified by cold hits are then convicted, nor is there at present any easy way to answer this question, because the outcomes of cold hit cases are not recorded. For instance, a 2001 study of New York's first 102 cold hits found that four hits had resulted in convictions and that charges were pending in 14 others; in two-thirds of the cases, however, no information was available.[66]

Other proposed scientific studies involving the justice system are less clearly appropriate. As this volume goes to press, for example, an investigation to find a Louisiana serial killer that had already been notable for achieving many controversial law enforcement "firsts"[67] also became the first known investigation in the United States to predict a suspect's race from DNA left at the crime scenes. Because most serial killers are white, police had been searching for a white man, until investigators sent the suspect's sample to DNAPrint Genomics, which typed the crime scene sample as being 85 percent African ancestry and 15 percent American Indian. The suspect arrested in the killings is black; it is not known if he has any American Indian ancestors.[68]

Britain has had an active interest in phenotypic profiles of suspects based on an analysis of their DNA—which they call DNA "photofits"—for some time, and the technology has already helped police there solve crimes. Currently, DNA analysis can reveal ethnic appearance as well as red hair and eye color, and researchers are attempting to find genetic links to other physical traits, such as jaw shape, although some scientists feel the task is so complex that much

further progress is not likely.[69] From the perspective of criminal investigators, being able to reliably predict the appearance of a suspect in a given case is useful (and stands to be more so if the technology improves), as in the Louisiana case, when crime scene DNA fails to match any database samples and when there is no suspect to test.

Yet whatever the benefits of its individual acts, the *practice* of what we might call "genetic racial profiling" raises complex issues. The science of “photofitting” has developed largely by giving researchers access to police databases.[70] Such research raises a variety of potential issues. First, many genes involved in physical appearance are also connected to inherited diseases; for example, pigmentation genes are involved in skin cancers, and mutated versions of facial genes could cause congenital abnormalities. As Duster and Allen note, there are also scientific questions about the meaningfulness of correlational research that begins with a population that is already weighted towards certain racial and ethnic groups, and extrapolates from there. Moreover, if Duster and others are correct that the justice system engages in systemic racial bias that results in certain racial groups being

far more represented than others, then the fact that the results of research conducted on their tissue samples could be used to stigmatize them (and fellow members of their racial or ethnic group, including their families) as "potential criminals" seems to add insult to injury.

But as Allen and Duster note, perhaps the biggest concern about genetic tests that claim to predict race from DNA is that it would make behavioral genetic research much easier. What role, if any, should our knowledge of the relationship between behavior and genetics should play in the justice system? This is the major debate on the horizon, and the positions in this debate have not yet fully crystallized. Increased claims about the relationships between our behavior and our genes combined with behavior-based genetic surveillance make it inevitable that this debate will come, however. Should claims about genetically determined behavior enter into decisions about guilt, innocence, and potential for rehabilitation? Will such claims stigmatize some members of our society as genetically programmed to be criminals? Could increased understanding of the causes of behavior yield therapeutic interventions?

Conclusion

DNA has rapidly become one of the pillars of the criminal justice system. As a society, we have reached a consensus on particular applications of that technology in the areas of post-conviction relief and convict DNA databases. As noted in the introductory chapter, it is less clear whether we have followed through on that consensus. In the post-conviction area, several states have not taken the most minimal steps to create statutory rights to review, and in many of the remaining states, the statute is an unfounded mandate, no legislation or resources ensure the preservation and categorization of evidence, or the criteria for qualifying under the statute is unreasonably narrow. DNA databases have received more support—all 50 states have authorized the creation of databases—but too often resources have been slow to follow the mandate. And, while the reallocation of resources and change of routines that post-conviction review and DNA databases require have been difficult for the criminal justice system to achieve, the next generation of questions

will be even more difficult for the system to wrestle with.

Notes

---

1. Adam Liptak, "Prosecutors See Limits to Doubt," *The New York Times*, February 24 2003.

2. When San Diego County prosecutors offered free DNA tests to some inmates in 2000 (the first in the country to do so), they had few takers. In Broward County, Florida, only 3. of 29 death-row inmates have accepted offers to be tested. Finally, a New Jersey program that offered free tests to felons was actually suspended because so *few* convicts (fewer than 12) applied. R. Willing, "Few Inmates Seek Exonerations with Free DNA Tests," *USA Today*, July 30 2002. Suggested reasons for the low turnout include convict fears that tests will confirm their guilt, making pardon or parole more difficult, or that they will thereby be linked to other crimes; and likelihood that those many cases of wrongful conviction have already been pursued by defense lawyers who specialize in DNA-related exonerations. See also the statement of Honorable William D. Delahunt, House Judiciary Committee on Crime, *The Innocence Protection Act of 2000: Hearings on H.R. 4167*, 106th Cong., 2nd sess., 2000, which discusses states that have adopted postconviction

statutes without experiencing the dreaded "floodgate" effect.

3. For instance, according to South Dakota Republican Senator Kermit Staggers, the main sponsor of a postconviction measure that was killed in his state's House, tests cost about $100 plus administrative expenses, while "it costs thousands of dollars a year to house an inmate." C. Brokaw, "House Committee Kills Plan to Help Convicts Get DNA Tests," *The Associated Press State & Local Wire*, February 13 2002. According to the Arizona Department of Corrections, the average cost of keeping one individual in prison in that state is $45.49 per day. Brokaw, "House Committee Kills Plan to Help Convicts Get DNA Tests," According to Barry Scheck, costs for housing an inmate at an average state prison run from $20,000 to $25,000 a year. B. Alpert, "DNA Tests Cost Less Than Housing Inmate; Case of L.A. Man Cleared in Rape Drives Push for Law," *Times-Picayune*, February 28 2000. Texas officials estimate that the state's postconviction statute will generate up to 50 cases of court-ordered DNA testing or retesting each year, at an annual cost to the state of about $73,000. J. B. Elizondo Jr., "Governor Signs DNA

Testing Bill; Under New Law, State Will Pay For," *Austin American-Stateman*, April 6 2001.

4. The Innocence Project adds that while evidence is reported lost or destroyed in 75 percent of the cases they accept, "it takes years to determine if that's really the case." See statements of Peter Neufeld and Barry Scheck, *The Innocence Protection Act of 2000: Hearings on H.R. 4167*,

5. "A Pandora's Box," *The Economist*, December 14 2002.

6. Illinois' post-conviction statute, for instance, requires the preservation of evidence permanently for homicide conviction, 25 years for severe felonies as defined in the criminal code, and 7 years for any other felonies, unless the court is petitioned by the state and granted disposal of evidence. 725 Ill. Comp. Stat. §5/116-3 (1997).

7. For a discussion of the inconsistent approaches to postconviction DNA testing among jurisdictions, see B. A. Masters, "DNA Testing in Old Cases Is Disputed; Lack of National Policy Raises Fairness Issue," *The Washington Post*, September 10 2000, A1, A5.

8. B. Barrouquere, "Despite Law, DNA Test Fund Empty," *The Advocate*, December 13 2002.

9. In addition, in some states, laws and court rulings do not allow the governor to consider pardons even when DNA evidence casts doubt on a conviction. R. A. Jr. Oppel, "States Move Toward Easing Obstacles to DNA Testing," *The New York Times*, June 10 2000

10. Note that opting for litigation does not completely avoid the need for prosecutorial consent, because few judges are willing to order DNA testing for a *habeas* petition without the consent of the prosecutors. J. Autrey and R. Rodriguez, "Access an Issue in DNA Testing," *Fort Worth Star-Telegram*, July 20 2000.

11. See the statement of Peter Neufeld, Senate Judiciary Committee, *The Innocence Protection Act of 2000: Hearings on S. 2073*, 106th Cong., 2nd sess., 2000.

12. Oppel, "States Move Toward Easing Obstacles to DNA Testing," In Minnesota, for example, a defendant must bring a motion for new trial based on newly discovered evidence within fifteen days of the verdict. Minn. R. Crim. P. 26.04 (West 2000).

13. Many states have even shorter statutes of limitations for death penalty cases. **Donald E. Wilkes, State Postconviction Remedies and Relief € 1-12, at 27 (1996).**

14. See National Commission on the Future of DNA Evidence, "The Future of Forensic DNA Testing: Predictions of the Research and Development Working Group," (Washington, D.C.: National Institute of Justice, U.S. Department of Justice, 2000), 9; C. Bryant, "When One Man's DNA is Another's Exonerating Evidence: Compelling Consensual Sexual Partners of Rape Victims to Provide DNA Samples to Post-conviction Petitioners," *Columbia Journal of Law & Social Policy* 33 (2000): 123.

15. R. Bailey, "Guilt Trip: Prosecutors Who Believe in Justice Should Be Clamoring for DNA Testing," *United Press International*, November 7 2002 See www.dnapolicy.net for examples of post-conviction statutes.

16. Illinois produced fourteen exonerations; New York produced seven. Alpert, "DNA Tests Cost Less Than Housing Inmate; Case of L.A. Man Cleared in Rape Drives Push for Law,"

17. For example, the proposed Innocence Protection Act gives those convicted of a federal crime access to post-conviction testing in certain circumstances, but it would effectively force states to adopt similarly

broad statutes of their own, or else lose federal funding. See **WEBSITE**

18. Indeed, some courts (e.g., *Summerville v. Warden* 641 A.2d 1356 (Conn. 1994)) have ruled that convicts have a constitutional right to demonstrate their actual innocence through *habeas corpus* review, under either the Eighth Amendment's protection against cruel or unusual punishment or the Due Process Clause of the Fourteenth Amendment. Other courts (e.g., *Sewell v. State* 592 N.E.2d 705 (Ind. App. 1992); *Commonwealth v. Brison* 618 A.2d 420 (Pa. Super. Ct. 1992); *Dabbs v. Vergari* 570 N.Y.S.2d 765 (N.Y. 1990)) have, citing fundamental principles of fairness and justice, confirmed a right to testing under *Brady v. Maryland* 373 U.S. 83 (1963), in which the U.S. Supreme Court held that a defendant has a constitutional right to be informed of exculpatory evidence. In *Dabbs v. Vergari*, for instance, the court ruled that, "[n]otwithstanding the absence of a statutory right to post-conviction discovery, a defendant has a constitutional right to be informed of exculpatory information known by the state" (767). See J. Boemer, "Other Rising Legal Issues: In the Interest of Justice: Granting Post-Conviction Deoxyribonucleic Acid (DNA) Testing to Inmates,"

William Mitchell Law Review 27 (2001); R. L. Haller, "The Innocence Protection Act: Why Federal Measures Requiring Post-Conviction DNA Testing and Preservation of Evidence are Needed in Order to Reduce the Risk of Wrongful Executions," *New York Law School Journal of Human Rights* 18 (2001).

19. Both Australia and Great Britain are considering exceptions to double jeopardy in cases where compelling new evidence has emerged, such as DNA test results not available at the time of acquittal. The Law Commission of England recommended an exemption in murder cases in which compelling and reliable new evidence emerged. The former chief justice of Australia's High Court, Sir Anthony Mason, similarly called for an exemption. M. Owen-Brown, "Remove Double-Jeopardy Rule, Says Ex-Chief Justice," *The Advertiser*, December 23 2002 T. Richissin, "Britain Considers Judicial Reforms; Double Jeopardy Allowed under Broad Plan by Blair," *The Baltimore Sun*, December 2 2002 N. Cowdery, "In Compelling Cases, A Retrial Makes Sense," *The Australian*, December 16 2002

20. "Police Furious over Forensics Sell-Off Plans," *The Observer*, January 19 2003.

21. The extent to which these restrictions are necessary to protect the system from a deluge of requests is discussed below.

22. [AUTHORS WILL PROVIDE]

23. [AUTHORS WILL PROVIDE]

24. Indiana is even stricter, making testing available only to murder convictions or a class A, B, or C felony. Ind. Code Ann. €€ 35-38-7-1, 35-38-7-5 (Michie Supp. 2001). Tennessee enumerates the crimes of which a person must have been convicted in order to petition the court for forensic DNA analysis, including first degree murder, second degree murder, aggravated rape, rape, aggravated sexual battery or rape of a child, attempted commission of any of these offenses, or any lesser included offense of these offenses. Tenn. Code Ann. € 40-30-403 (Supp. 2001).

25. Louisiana's statute, for instance, covers anyone in custody. 2001 La. Acts 1020 (2001).

26. Maine, for instance, limits requests for testing to convictions that carry "the potential punishment of imprisonment of at least 20 years," and petitioners must be serving the sentence at the time of petition. Me. Rev. Stat. Ann. tit. 15, € 2137 (West Supp. 2001).

27. Idaho's statute provides that capital case review will be granted only if petitioner files within 42 days from the day of judgment or by July 1, 2002 (whichever is later). For other cases, petitioner must file within one year from the day of judgment or by July 1, 2002 (whichever is later). Idaho Code §19-4902 (b) (2001).

28. E.g., New Mexico, which requires filing of the petition prior to July 1, 2002, and states explicitly that "[t]he district court shall not accept any petitions after that date." N.M. Stat. Ann. € 31-1A-1(H) (Michie Supp. 2001). Oregon's statute has a statute of limitations for all cases of four years from the enactment of the statute. 2001 Or. Laws 697 (2001). Washington state allows prisoners who were convicted on or before December 31, 2004, to submit a request to the county prosecutor for DNA testing; "On and after January 1, 2005, a person must raise the DNA issues at trial or on appeal." Wash. Rev. Code Ann. € 10.73.170(1) (West Supp. 2002).

29. New York's statute, for instance, contains no statute of limitations, but restricts legitimate petitioners to those convicted of a crime before January 1, 1996. N.Y. Crim Proc. Law §440.30 (1-a). The Virginia legislature took something of a middle

route. Instead of placing a finite cap on prisoners' requests for testing, the legislature instructed the court to use its discretion in considering, when evaluating motions for testing, any unreasonable delays in "filing of the petition after the evidence or the test for the evidence became available at the Division of Forensic Science." See Va. Code Ann. € 19.2-327.1(A)(v) (Michie Supp. 2001).

30. St. Louis Circuit Attorney Jennifer Joyce, for instance, has repeatedly refused to permit testing of rape evidence in such cases. T. Bryant, "Tests of Convicts Have Only Just Begun," *St. Louis Post-Dispatch*, August 4 2002 In one case, a convict was given access to testing, whose exculpatory results were then deemed irrelevant to his innocence. Roy Wayne Criner was denied a new trial after DNA tests showed he was not the source of semen found in the victim. The judge reasoned that he could have worn a condom. Two years later, more DNA tests showed Criner's innocence, and after ten years in prison, then-Governor George W. Bush pardoned him. S. Cohen and P. Shepard, "DNA Test Clears Scores of Felons," *Minneapolis Star Tribune*, October 8 2000.

31. Two Pennsylvania Superior Court decisions wisely granted DNA testing when the conviction was based largely or primarily on identification testimony, but denied testing when a confession or other form of evidence was relied upon. S. P. Duffy, "DNA Test Could Offer Exculpatory Evidence," *The Legal Intelligencer*, August 30 2001.

32. Cal. Penal Code € 1405(c)(1)(A), emphasis added.

33. Sometimes there is even confusion over the require standard of proof in state with enacted statute that specify this. In Texas, for example, a court ruled that the defense in a particular case must meet a reasonable probability of innocence standard, despite wording in the statute that specified a lower standard of a reasonable probability that the defendant would not have been prosecuted or convicted. E. Timms and D. Jennings, "Ruling Sets DNA Test Rights," *The Dallas Morning News*, April 18 2002

34. See, e.g., Tenn. Code Ann. € 40-30-404 (Supp. 2001).

35. N.Y. Crim. Proc. Law € 440.30 (1-a) (McKinney 1994 & Supp. 2002).

36. For example, when a reasonable probability exists that a more favorable verdict or sentence would have

been the result, Arizona instructs courts that they may order the testing; but where there is a reasonable likelihood petitioner would not have been prosecuted or convicted, Arizona directs courts that they shall order the testing. Ariz. Rev. Stat. Ann. € 13-4240(B)(1), (C)(1)(a).

37. For a fuller discussion of the various claims of innocence and their relation to post-conviction DNA testing and relief, see R. Schaffer, *Texas Lawyer*, November 12 2001. See also Berger, this volume.

38. St. Louis DA Jennifer Joyce is now drafting legislation that would criminalize inmates whose DNA tests confirmed guilt by charging the cost of failed tests to prison accounts, adding six months to such prisoners' sentences, and requiring the attempts to be considered at parole hearings. Liptak, "Prosecutors See Limits to Doubt," See also Bryant, "Tests of Convicts Have Only Just Begun,"

39. After his first chance at exoneration failed when the sample was consumed by a state crime lab (see fn42) [make sure this is still the correct fn after editing], John Douglas Waller received permission to test hairs found at the crime scene. Although both sides expect that the hairs will not match those of Waller, Texas

law is silent on what relief is required after an exculpatory test. J. Council, "Right Without a Remedy? Law Silent on What Happens If DNA test is favorable to defendant," *Texas Lawyer*, December 10 2001.

40. Boemer, "Other Rising Legal Issues: In the Interest of Justice: Granting Post-Conviction Deoxyribonucleic Acid (DNA) Testing to Inmates," 1989.

41. N.Y. Crim. Proc. L. 440.10(1)(g)(McKinney 1995); *People v. Dabbs*, 587 N.Y.S.2d 90, 92 (1991).

42. F. Green, "Lawyer Stresses Power of DNA; Tests Clear Even Some Who 'Confess'," *The Richmond Times-Dispatch*, July 17 2001.

43. See www.innocenceproject.org.

44. "A Pandora's Box,"

45. E. Connors et al., "Convicted by Juries, Exonerated by Science: Case Studies in the Use of DNA Evidence to Establish Innocence After Trial," (National Institute of Justice, 1996).

46. The Honourable Fred Kaufman, "Report of the Kaufman Commission on Proceedings Involving Guy Paul Morin," (Ministry of the Attorney General, Government of Ontario, Canada, 1998). Available at www.attorneygeneral.jus.gov.on.ca/english/about/pubs/morin.

47. See www.ccrc.gov.uk.

48. The Innocence Project found that in 84 percent of its first 70 exonerations, the original conviction involved an eyewitness identification that turned out to be mistaken. Of the project's first 82 convicts to be exonerated by DNA, 73 percent were convicted based on such mistaken witness testimony. See www.innocenceproject.org. Because the Innocence Project accepts a select group of cases (of which their successful exonerations are even more select), the percentages they report of mistaken testimony are likely to be much higher than the general rate of mistaken eyewitness identification. Still, the inherent difficulties of eyewitness/victim identification, as well as those measures that can mitigate these difficulties, are well documented.

49. This policy is law in Minnesota, Alaska, and the United Kingdom.

50. J. S. Liebman et al., "Symposium: Restructuring Federal Courts: Habeas: Capital Attrition: Error Rates in Capital Cases, 1973-1995," *Texas Law Review* 78 (2000): 1864.

51. D. Babwin, "Gov. George Ryan Grants Blanket Clemency for Death Row Inmates," *The Associated Press*

State & Local Wire, January 11 2003. Glendenning's moratorium was also based on a Maryland survey that concluded that state prosecutors are far more likely to seek the death penalty for black suspects charged with killing white victims than in other cases. C. O'Clery, "US Death Penalty 'Has Racial Bias'," *The Irish Times*, January 9 2003.

52. Scheck proposed this during the conference, "DNA and the Criminal Justice System," John F. Kennedy School of Government, Harvard University, on November 19, 2000.

53. See, however, our discussion below of the need for more empirical research on the effectiveness of databases.

54. This understates the cost of collection, however. In some cases the administrative costs of collecting convicts into one location are considerably greater than this—especially for convicts who do not serve any time. In addition, casework is dramatically more expensive—on the order of $2,000 or more per sample.

55. The Ohio Bureau of Criminal Identification and Investigation, for example, keeps the DNA profiles and compares samples with evidence collected in unsolved crimes. "DNA Database of Suspects Draws

Support, Criticism," *The Associated Press State & Local Wire*, August 8 2002. See also *Damon Smith v. State of Indiana*, 744 N.E.2d 437 (2001), in which police got a cold hit in a rape case from a sample that was collected from the defendant in a separate rape trial and kept in the database even though the defendant was acquitted. The trial court denied defense's motion to suppress the DNA evidence, and the denial was upheld on appeal.

56. As Kaye acknowledged at his presentation during "DNA and the Criminal Justice System."

57. This is a concern with respect to the current databases as well, but less so, since these issues only come up when both individuals whose genetic connection one is studying are in the database.

58. [AUTHORS WILL PROVIDE]

59. According to State Court Sentencing of Convicted Felons, 1998 Statistical Tables, 927,000 individuals were convicted of felonies in 1998. For those for whom there were data, 53 percent (about 500,000) were identified as Caucasian, and 44 percent (about 400,000) were identified as African American. According to the 2000 census, there are 34,658,000 to 36,419,000 African Americans and 211,460,000 to 216,930,000 Caucasians.

60. Personal communication with David Coffman, December 17, 2001.

61. In principle, states, coupled with an informed consent process, could give convicts the option of "donating" their DNA samples toward research.

62. Fred Zain, a former director of the Division of Public Safety's serology division at the West Virginia state police crime laboratory, was indicted on charges of perjury, accused of lying for years on the witness stand to favor prosecutions. Zain died of cancer in 2002 before his case was retried after the first trial ended in a hung jury. See *In re Investigation of the W. Va. State Police Crime Lab., Serology Div*., 438 S.E.2d 501, 503 (W. Va. 1993).

In 2001, Oklahoma City police chemist Joyce Gilchrist was fired after an FBI report found that she did poor work and provided false or misleading testimony. B. Bohrer, "Scientist's Cases under Review in 2 States After DNA Clears Man of Rape," *The Associated Press*, December 15 2002.

In Illinois, three men who served 14 years in prison, and a fourth, who served 6 and a half, were exonerated of the rape and murder of medical student Lori Roscetti. A DNA expert found that the analyst at

the original trial, who had said semen found at the crime scene could be that of the men, gave testimony that amounted to "scientific fraud." The same analyst had testified at two 1986 sexual assault trials and at the trial of an accused serial rapist; all three convictions were later overturned. D. K. Baker, "When 'Justice Delayed' is 'Non-Existent Justice'," *Ethnic News*, December 13 2001

Similarly, Arnold Melnikoff, the former director of Montana's state crime laboratory for almost two decades and, for the past 13 years, forensic scientist for the Washington State Police, was placed on paid leave while both states conduct reviews of about 100 of his cases. The audits come after DNA evidence cleared a Montana man who spent 15 years in prison for rape based on Melnikoff's testimony about head and pubic hair samples. He had testified that the chances that either set of hairs found at the scene were not those of the defendant were 1 in 100, and that since head and pubic hairs look different, "it's a multiplying effect, it would be 1 chance in 10,000." An F.B.I. report concluded that the hairs were microscopically dissimilar from those of the defendant's, and that the head hair was similar to that of the victim. Other

experts argued that the testimony was "totally fallacious" and "without any scientific basis," and suggested that intentional bias might have been present. Owen-Brown, "Remove Double-Jeopardy Rule, Says Ex-Chief Justice,"

Most recently, FBI scientist Kathleen Lundy admitted knowingly giving false testimony about her specialty of bullet analysis. J. Solomon, "F.B.I. Scientist Admitted False Testimony," *The Boston Globe*, Thursday, April 17 2003

63. For instance, retired F.B.I. metallurgist William Tobin has questioned the bureau’s science on bullet analysis, prompting the F.B.I. to request a review of its methodology by the National Academy of Sciences. Solomon, "F.B.I. Scientist Admitted False Testimony," See also several cases of error in DNA analysis discussed in **fn 46.**

64. In the San Francisco Crime Lab, a court noted that the lab's then-head, Alan Keel, demonstrated an unacceptable degree of bias toward the prosecution. The court, in declaring his DNA evidence inadmissible, described Keel's declaration in opposition to defense discovery as "beyond advocacy—it indicated a critical attitude toward the defense function in a criminal

case." See *People v. Bokin*, No. 168461, slip op. at 15 (Cal. Super. Ct. May 5, 1999).

Police officials suspended DNA testing at the Houston police crime lab after a December 2002 audit found various problems with its methods, including poor calibration and maintenance of equipment, improper record keeping and a lack of safeguards against contamination of samples. In response, the DA’s office ordered a review of all convictions based on DNA evidence tested by the police laboratory, the lab was shut down, and it has been banned from entering DNA profiles into CODIS. See N. Madigan, "Houston's Troubled DNA Crime Lab Faces Scrutiny," *The New York Times*, February 9 2003 Solomon, "F.B.I. Scientist Admitted False Testimony," The Houston lab has also been accused of intentional bias. A lab employee offered evidence in a rape trial to suggest that a DNA sample recovered by investigators was a precise match for the defendant, but other DNA experts disagreed, arguing the sample was in fact a mixture of DNA from at least two people, and that the lab testimony amounted to "outright misrepresentations of scientific findings." See Madigan, "Houston's Troubled DNA Crime Lab Faces Scrutiny,"

F.B.I. lab technician Jacqueline Blake resigned after the Justice Department's inspector general began an investigation of her on charges that she failed to follow proper procedure during her analysis in at least 103 DNA cases in the past few years; she is accused of failing to compare the DNA evidence with control samples, which is required to obtain accurate results. And F.B.I. lab technician Jacqueline Blake resigned after the Justice Department’s inspector general began an investigation of her on charges that she failed to follow proper procedure during her analysis in at least 103 DNA cases in the past few years; she is accused of failing to compare the DNA evidence with control samples, which is required to obtain accurate results. Solomon, "F.B.I. Scientist Admitted False Testimony,"

The Las Vegas police forensics lab mistakenly switched the DNA profiles of two suspects in their computer, which resulted in two false cold hits. The error caused an innocent man to spend nearly a year in jail on sexual assault charges, for which he faced life imprisonment. It also prompted an audit of all the DNA analyses ever done by that lab, as well as an internal investigation that revealed that safeguards aimed at catching such mistakes had failed, primarily because

they do not review for text or transcriptional errors. G. Puit, "Police Forensics: DNA Mix-Up Prompts Audit at Lab," *Las Vegas Review-Journal*, April 19 2002; G. Puit, "Changes Proposed in DNA Handling," *Las Vegas Review-Journal*, May 15 2002. It was unclear whether the suspect whose DNA profile actually matched the crime scene sample would be prosecuted, since the victim of one of the sexual assaults had already made an (erroneous) identification of the innocent man as her attacker in court.

A judge dismissed drunken driving charges against a 20-year-old college student after DNA testing paid for by his parents showed police had used the wrong blood sample. The same police department has faced questions of its handling of blood evidence before, including during the O.J. Simpson murder trial."Judge Dismisses DUI Case after DNA Shows LAPD Tested Wrong Sample," *The Associated Press*, December 15 2002.

Cellmark, a British company that specializes in DNA identification, made a false positive DNA match in 1987 that could have led to the execution of an innocent man; they further attempted a cover-up of the error until it was revealed by an external

investigation. W. Hodgkinson, "DNA in the Dock," *The Observer*, November 30 2002.

65. For a discussion of the efforts of prosecutors, the F.B.I., and private forensic laboratories to resist defense discovery, see W. C. Thompson, "Evaluating the Admissibility of New Genetic Identification Tests: Lessons from the 'DNA War'," *Journal of Criminal Law and Criminology* 84, no. Spring (1993). With respect to the success of such resistance, since there is no nationally recognized right of access to the data underlying DNA tests, defendants must utilize existing rules of discovery embedded in state and federal statutes and court rulings. Courts, however, have applied these rules to the data underlying DNA tests in a variety of ways, and such rules thus entail a tenuous path, at best, for the defendant seeking access to the data. For an overview of the relevant rules of discovery and various court reactions to them in the context of DNA data, as well as arguments used by commercial labs in resisting discovery, see J. N. Mellon, "Note: Manufacturing Convictions: Why Defendants Are Entitled to the Data Underlying Forensic DNA Kits," *Duke Law Journal* 51, no. December (2001).

66. R. Willing, "DNA Testing Fails to Live Up to Potential," *USA Today*, October 7 2002.

67. The investigation was controversial, first, for launching one of the largest DNA dragnets in the United States, and for allegedly using coercive tactics in some cases to procure the more than 1,000 "voluntary" samples. Concern about the dragnet only heightened when the state crime lab announced that it would eventually return the excluded samples and profiles to police who, though they could not place them in either the state or federal databases, which restricts profiles to arrestees and convicts, respectively, would nevertheless retain them to be searched by hand in future investigations. Melissa Moore, "Use of DNA Tests in Killings Raises Rights Questions," *Sunday Advocate*, November 24 2002.

68. DNAPrint Genomics is a Sarasota, Florida, company that owns the rights to a test developed by Mark Shriver, a Pennsylvania State University geneticist that predicts race from DNA. (It is Shriver's 1997 *American Journal of Human Genetic*s article announcing this test that Duster discusses near the end of his chapter.) The test uses markers that are more often found in people from one continent than another,

allowing investigators to predict "with reasonably high confidence" to which major continental race or races—African, Caucasian, East Asian or American Indian—an individual belongs. Police sent 20 samples, and did not tell the lab which one was from the crime scene. Nicholas Wade, "Unusual Use of DNA Aids in Serial Killer Search," *The New York Times*, June 3 2003

69. C. Wilson, "Ready for Your Close-Up? Working Out What Someone Looks Like from Only a DNA Sample is No Longer Science Fiction; You'd Be Surprised What Forensics Experts Can Already Do," *New Scientist*, July 20 2002.

70. Britain's advancements in this technology, for instance, were largely the result of a March 1996 Forensic Science Service analysis of the entire National DNA Database.