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Erin Murphy

New York University School of Law

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A TALE OF TWO SCIENCES

Erin Murphy*

THE DOUBLE HELIX AND THE LAW OF EVIDENCE. By *David H. Kaye*. Cambridge, Massachusetts and London, England: Harvard University Press. 2010. Pp. xvi, 330. \$47.50.

GENETIC JUSTICE: DNA DATA BANKS, CRIMINAL INVESTIGATIONS, AND CIVIL LIBERTIES. By *Sheldon Krimsky* and *Tania Simoncelli*. New York: Columbia University Press. 2011. Pp. xviii, 406. \$29.95.

“It was the best of times, it was the worst of times”¹ So might one describe the contrasting portraits of DNA’s ascension in the criminal justice system that are drawn in David Kaye’s *The Double Helix and the Law of Evidence*² and Sheldon Krimsky and Tania Simoncelli’s *Genetic Justice: DNA Data Banks, Criminal Investigations, and Civil Liberties*.³ For Kaye, the double helix stands as the icon of twenty-first-century achievement, a science menaced primarily by the dolts (lawyers, judges, and the occasional analyst) who misuse it. For Krimsky and Simoncelli, DNA is a seductive forensic tool that is prone to overuse and best distrusted, as evidenced by swollen national data banks, shady police and laboratory practices, and unverified claims that the science has aided hundreds of thousands of investigations. Both books were written by experienced DNA insiders. Krimsky, a Tufts University professor and bioethics expert, and Simoncelli, formerly the Science Advisor at the American Civil Liberties Union, were both active participants in early academic and policy debates around DNA databasing. So too was Kaye, a professor at Penn State University, who has served on a number of government committees devoted to DNA methods and who has also aided defense lawyers in an assortment of cases. So whose picture is right?

To some extent, that depends on your assessment of these two additions to the expanding bookshelf of works devoted to charting the history of forensic DNA typing.⁴ In key respects, the books are quite different and so do

* Professor of Law, New York University School of Law.

1. CHARLES DICKENS, *A TALE OF TWO CITIES* 1 (Oxford Univ. Press 1949) (1859).

2. David Kaye is a Professor of Law, Pennsylvania State University.

3. Sheldon Krimsky is a Professor of Urban and Environmental Policy and Planning at Tufts University, and Tania Simoncelli is a Special Assistant to the Commissioner of the Food and Drug Administration.

4. See, e.g., JAY D. ARONSON, *GENETIC WITNESS: SCIENCE, LAW AND CONTROVERSY IN THE MAKING OF DNA PROFILING* (2007); MICHAEL LYNCH ET AL., *TRUTH MACHINE: THE CONTENTIOUS HISTORY OF DNA FINGERPRINTING* (2011); KELLY M. PYREK, *FORENSIC SCIENCE UNDER SIEGE: THE CHALLENGES OF FORENSIC LABORATORIES AND THE MEDICO-LEGAL INVESTIGATION SYSTEM* (2007); DONALD E. SHELTON, *FORENSIC SCIENCE IN COURT: CHALLENGES IN THE TWENTY-FIRST CENTURY* (2010).

not obviously withstand direct comparison. Most significantly, they address different topics: *Genetic Justice* focuses on procedure—the collection and databanking of genetic information—whereas *Double Helix* is concerned with evidence—the admissibility and presentation of DNA results in court.⁵ They are also aimed at different audiences: *Genetic Justice* is clearly pitched to a general lay audience, whereas the technical language and descriptive detail of *Double Helix* better suits more specialized readers.

But these otherwise very different books nevertheless produce two shared insights into DNA typing. The first, likely transmitted inadvertently, is that forensic DNA typing is inherently political. To be clear, both books are balanced in their approach, and the tone of neither could be described as strident. Yet the authors' own ideological perspectives on harnessing genetic information for law enforcement purposes inevitably colors both analyses. Given their divergent views, then, the other commonality is all the more revealing: both books ultimately advocate for heightened transparency and accountability in forensic practices. Although their specific prescriptions vary, all authors argue against the closed methods currently enjoyed. It is from these shared characteristics, which this Review illustrates sequentially below, that readers can derive the ultimate, and most beneficial, lesson taught by both books: first, that forensic DNA typing has never been, and is not now, a “neutral” science wholly separable from the politics of criminal justice; but second, that there are nonetheless some things that might be done to help foster its independence.

I. THE POLITICS OF DNA

Because the books cover different aspects of the forensic use of DNA evidence—*Genetic Justice* focuses on investigative issues while *Double Helix* surveys the evidentiary treatment—there is no express relationship between them. Specifically, the aim of *Genetic Justice* is “to identify and define appropriate uses of DNA by law enforcement that will result in the furtherance of justice” (Krimsky & Simoncelli, p. xvii), while *Double Helix* “focus[es] on the appropriate application of the rules of evidence to the findings of scientists and technicians” (Kaye, p. xi). In short, while *Genetic Justice* is a contemporary story about cops on the street and computers in the lab, *Double Helix* is a historical account of lawyers and judges in the courtroom and scientists on the witness stand.

Yet despite these immediate differences, the authors' diverging attitudes toward DNA typing remain fairly evident. Both books make implicit and explicit normative judgments about the role that DNA science should play in criminal justice. Moreover, because most of the material is familiar to regular consumers of the forensic DNA literature, comparative perspectives on the topics (or even specific events) addressed in each book are readily available. When considered in this light, as the next Sections explain, the books

5. In the Preface, Kaye notes that he is currently working on a second book dealing with the procedural issues. Kaye, pp. xii–xiii.

reveal a view of forensic DNA from two distinct vantage points. Krimsky and Simoncelli appraise DNA methods through the eyes of skeptics, explicitly cautioning against every new expansion in forensic DNA practices, whereas Kaye takes a more sanguine approach, welcoming the use of DNA to the criminal justice system and reserving his greatest disdain for the adversarial system that receives it in a manner he deems clumsy toward (and, he hints, corruptive of) the science itself.⁶

A. ON THE STREETS: GENETIC JUSTICE

Genetic Justice speaks in the language of the cynic. The authors open by questioning whether “increasing reliance on DNA in our criminal justice system [has] furthered our pursuit of justice” (Krimsky & Simoncelli, p. xv; emphasis omitted). They close by providing a qualified negative answer to that question, citing privacy, equality, accuracy, and efficiency objections to expansive DNA practices (Krimsky & Simoncelli, Chapters Fourteen through Seventeen). In a stream of measured arguments, Krimsky and Simoncelli seek to persuade readers that more DNA testing is not necessarily better, and in fact may actively be worse.

The strength of *Genetic Justice* rests on its comprehensiveness. Krimsky and Simoncelli bring together a vast array of disparate materials that span a wide chronological spectrum and align them in order to afford a clearer view. Many scholars, myself included, have written on isolated aspects of DNA typing that are covered in the book, like familial searches,⁷ dragnets,⁸

6. Compare Krimsky & Simoncelli, p. 42 (questioning assumption that larger data banks will solve more crime), Krimsky & Simoncelli, p. 58 (doubting utility of dragnets), Krimsky & Simoncelli, p. 81 (finding rush to adopt familial search methods at “best premature, if not irresponsible”), Krimsky & Simoncelli, p. 92 (doubting present capacity of DNA typing to predict skin color), Krimsky & Simoncelli, pp. 285–89 (questioning accuracy of random match probabilities), Krimsky & Simoncelli, pp. 296–98 (expressing concern about DNA transfer), and Krimsky & Simoncelli, pp. 302–03 (pondering frequency of chimeras), with Kaye, p. 107 (criticizing courts that viewed the 1992 National Research Council (“NRC”) report as signaling lack of general acceptance), Kaye, p. 127 (distinguishing between legitimacy of different kinds of substructure objections), Kaye, p. 139 (observing that the judiciary had largely disregarded concerns raised in the 1992 NRC report even before the issuance of a subsequent report that addressed the objections), Kaye, p. 193 (describing one court’s reluctance to admit DNA statistics as a “misadventure”), Kaye, pp. 195, 202 (expressing frustration at resistance to likelihood-ratio method of computing significance of a match, and discussing this method as the preferred means of addressing the uncertainty of conditional probabilities), Kaye, p. 196 (concluding in discussion of the shortcomings of racial classification systems that “the proposal to pick the largest frequency in any of the major races generally is reasonable,” or recommending alternatively “to use a racially blended database”), and Kaye, p. 212 (indicating comfort with lack of admissibility challenges regarding Y-STR methods because “[t]he typing technology for Y-STRs does not differ from that for autosomal STRs” and the “population genetics are different, but no less understood”).

7. See, e.g., Erin Murphy, *Relative Doubt: Familial Searches of DNA Databases*, 109 MICH. L. REV. 291 (2010).

8. See, e.g., Christopher Slobogin, *Government Dragnets*, LAW & CONTEMP. PROBS., Summer 2010, at 107; Jennifer K. Wagner, *Just the Facts, Ma’am: Removing the Drama from DNA Dragnets*, 11 N.C. J.L. & TECH. 51 (2009).

phenotyping,⁹ or sketchy collection practices,¹⁰ but few have lined them all up next to one another to paint a stark picture of unrelenting expansion. Similarly, a handful of scholarly and policy reports have described the forensic practices of other countries, but few have juxtaposed them with one another—much less with the United States, and in a table!—to enable stark comparisons.¹¹

By collecting these materials together, Krinsky and Simoncelli clearly establish that the history of forensic DNA in the United States is one of unrelenting growth, and issue an appeal to pause for reflection. Take note of how far we have come, they seem to plead through each account of a new development, and ask precisely what has been gained and lost as a result. They describe how DNA databases began as a limited experiment in collecting samples from a narrow class of convicted felony sex offenders (Krinsky & Simoncelli, p. 29) and have since burgeoned (the number of known profiles doubling every two years) into repositories that “stop[] just short, at least for the present, of including every person’s DNA in a national network.”¹² And whereas courts once struggled to reconcile the Fourth Amendment with status-based sampling of convicted offenders—some of whom had long before completed their official terms of supervision—the debate has so shifted that now mere arrestees and even innocent relatives are on the table (Krinsky & Simoncelli, pp. 36–38).

To illustrate its point, *Genetic Justice* focuses on four different DNA tactics: dragnets, surreptitious sampling, familial searching, and phenotypic testing. For each, the authors offer critiques grounded both in fairness and accuracy terms. With respect to dragnets, they cite civil liberties concerns, adding that such sweeps typically reap little benefit in return. In fact, “[f]rom 1995 to 2005, about 7,000 people were tested in DNA dragnets in the United States” (Krinsky & Simoncelli, p. 62), and yet the single successful case arose in the context of a finite suspect pool, namely, employees at a nursing home (Krinsky & Simoncelli, p. 59). Surreptitious sampling, they contend, serves as a form of “backdoor to population-wide data banking.”¹³ Moreover, failing to regulate sneaky collection methods risks exploitation, especially since courts have proven reluctant to treat information-rich DNA samples as distinct from typed DNA profiles (Krinsky &

9. See, e.g., Dov Fox, *The Second Generation of Racial Profiling*, 38 AM. J. CRIM. L. 49 (2010); Bert-Jaap Koops & Maurice Schellekens, *Forensic DNA Phenotyping: Regulatory Issues*, 9 COLUM. SCI. & TECH. L. REV. 158 (2008).

10. See, e.g., Elizabeth E. Joh, *DNA Theft: Recognizing the Crime of Nonconsensual Genetic Collection and Testing*, 91 B.U. L. REV. 665 (2011).

11. Krinsky & Simoncelli, Appendix; see also CAROLE MCCARTNEY ET AL., NUFFIELD FOUND., FUTURE OF FORENSIC BIOINFORMATION (2010), available at <http://www.nuffieldfoundation.org/sites/default/files/files/forensic-bioinformation-report.pdf>.

12. Krinsky & Simoncelli, p. 28. They do cite one exception to this general trend: now-disgraced former Governor Mark Sanford of South Carolina vetoed a bill to expand the database to include arrestees in his state. Krinsky & Simoncelli, p. 42.

13. Krinsky & Simoncelli, p. 116 (quoting Elizabeth E. Joh, *Reclaiming “Abandoned” DNA: The Fourth Amendment and Genetic Privacy*, 100 NW. U. L. REV. 857, 858 (2006)).

Simoncelli, pp. 116–17). Familial searches represent a “fundamental shift in the intent and purpose of the database—from one of investigation of known offenders to its use as an intelligence tool” (Krimsky & Simoncelli, p. 84), and should raise concerns given the high rate of false positives that such searches can return (Krimsky & Simoncelli, p. 75). And lastly, they doubt the scientific basis of some proposed methods of phenotyping, such as the asserted ability to discern skin tone from ancestry (Krimsky & Simoncelli, pp. 103–04). But assuming such techniques could be improved, Krimsky and Simoncelli willingly embrace the use of DNA to discover “externally perceptible traits, such as hair color or stature, and nonsensitive internal or behavioral traits, such as voice type, lefthandedness, or absolute pitch” (Krimsky & Simoncelli, p. 106). Nevertheless, they caution against testing for more sensitive traits, in part for fear of starting down the familiar road of “‘biologiz[ing]’ crime and antisocial behavior” (Krimsky & Simoncelli, p. 98).

Genetic Justice also engages the argument for a universal database, incidentally most famously associated with David Kaye,¹⁴ although not relevant to his current book. Their response marks the most thorough counterargument advanced to date. Krimsky and Simoncelli dispute claims that the database would prevent or deter crime, noting in particular that much crime occurs among those who know one another or as a result of inflamed tempers (Krimsky & Simoncelli, pp. 145–49). They also doubt that the database would ameliorate racial disparities, remarking that “[a] universal database . . . has an egalitarian feel to it, even if it does not do much to address the real causes of racial disparities in our criminal justice system” (Krimsky & Simoncelli, p. 163). Instead, they expect that the major advantage of a universal database would be to “afford[] government an unprecedented technology of mass surveillance” (Krimsky & Simoncelli, p. 164)—an advancement not, in their estimation, to be desired.

In both concert and contrast with the United States’ experience, Krimsky and Simoncelli next present a survey of forensic DNA practices around the globe. Most striking in this chapter is the extent to which practices considered indispensable in the United States are rejected elsewhere. For example, on multiple occasions, Krimsky and Simoncelli note that DNA samples are retained in every jurisdiction in the United States, even after the typing of noncoding loci has been completed (Krimsky & Simoncelli, pp. 237–41). In contrast, every other nation in the survey imposes some form of limitation on the retention of biological samples. At one extreme, Japan and Germany require destruction after profiling, and even profiled records are subject to periodic review; at the other end, England and Wales limit retention to a natural lifespan (100 years) (Krimsky & Simoncelli, Appendix). Krimsky and Simoncelli argue against indefinite retention, rejecting the contention that maintaining the samples is necessary for quality assurance or retesting, and adding that neither purpose justifies leaving such intimate

14. See D.H. Kaye & Michael E. Smith, *DNA Identification Databases: Legality, Legitimacy, and the Case for Population-Wide Coverage*, 2003 Wis. L. REV. 413.

information in law enforcement's hands (Krimsky & Simoncelli, pp. 237–41). Quoting a British report, they add that “if the identity and whereabouts of the subject are known, it will be possible, and not disproportionately expensive or difficult, to obtain a new sample for analysis; conversely, if the subject's whereabouts are not known, having a DNA sample is unlikely to assist in locating them”¹⁵ Nevertheless, across the United States, court after court has either explicitly approved sample retention or simply ignored the issue.¹⁶

At the same time, the chapter reveals the lack of uniformity in DNA practices; each country's idiosyncratic proclivities shine through. Although not identical to the United States' approach, Australia's system most closely resembles it, both in how it handles the hurdles presented by a federalist structure and in its generally favorable attitude toward broad testing and retention (Krimsky & Simoncelli, pp. 196–99). England and Wales, in the absence of meaningful statutory or constitutional restrictions on collection, have amassed the largest database per capita, with profiles of roughly 7 percent of the U.K. population.¹⁷ Italy's database, which only recently became operable, functions in something of a legal vacuum in that the database preceded the legislation authorizing and governing it (Krimsky & Simoncelli, pp. 212, 220). Germany, consistent with its cultural anxiety about law enforcement and government genetics, strictly circumscribes the permissible scope of collection, analysis, and databasing (Krimsky & Simoncelli, pp. 206–11). Lastly, the small size of Japan's database, which contains the profiles of fewer than 0.0008 percent of the country's population, can be directly traced to its policy of collecting samples from suspects only when relevant to an investigation rather than by categorical classes (Krimsky & Simoncelli, p. 188).

The final part of the book most forthrightly presents Krimsky and Simoncelli's prescriptive assessments and recommendations. They cover four major areas: privacy, equality, accuracy, and efficacy. With regard to privacy, they highlight the enormous holes in the current statutory framework governing genetic information collected for criminal justice purposes, and pointedly compare that to the more protective measures undertaken in the medical context (Krimsky & Simoncelli, pp. 236–39). Here again Krimsky and Simoncelli conflict with some of David Kaye's early work, which they quote as having “state[d] unequivocally that behavioral genetics re-

15. Krimsky & Simoncelli, p. 241 (quoting HUMAN GENETICS COMM'N, NOTHING TO HIDE, NOTHING TO FEAR? 70 (2009), available at <http://www.hgc.gov.uk/UploadDocs/DocPub/Document/Nothing%20to%20hide,%20nothing%20to%20fear%20-%20online%20version.pdf>).

16. Krimsky & Simoncelli, p. 238 (noting that Wisconsin is the only state that requires sample destruction, but apparently has never enforced this requirement); see also Erin Murphy, *Databases, Doctrine & Constitutional Criminal Procedure*, 37 *FORDHAM URB. L.J.* 803, 833–34 (2010) (observing that courts focus on moment of collection only).

17. Krimsky & Simoncelli, pp. 168–69. In contrast, the United States' database, although significantly larger in number, stores the profiles of roughly 2.7 percent of the population. Krimsky & Simoncelli, p. 189.

searchers who desire to use the samples in [the Combined DNA Index System] . . . are excluded from doing so . . . '[by] the disclosure and usage provisions of the current database laws'" (Krimsky & Simoncelli, p. 238). They correctly counter that the statutory framework phrases its proscriptions in general terms like "authorized" or "for law enforcement identification purposes" (Krimsky & Simoncelli, pp. 237–38), leaving wide room for interpretation about what exactly constitutes a legitimate or illegitimate practice. Although to date there is no reason to believe that the government has handed over samples for behavioral genetics experimentation, there is also nothing in the law as written that clearly proscribes it from doing so. Indeed, it is easy to imagine the government arguing that disclosure of samples for testing for a "pedophilia" gene is, in fact, a "law enforcement identification purpose."

As regards equality, Krimsky and Simoncelli note (as have many others) that the racial disparities of the criminal justice system will be reproduced in a database based on convictions. However, they add another interesting layer of analysis: once again skirmishing in part with some of Kaye's earlier work, they evaluate his claim that adding arrestees to the database would reduce its racial skew (Krimsky & Simoncelli, p. 259). Using publicly available figures, which unfortunately do not include the actual composition of the national database (more on that later), they determine that the leavening effect is likely to be much smaller than anticipated, particularly if only certain arrestees are typed (Krimsky & Simoncelli, p. 259). Moreover, when the result is computed as a fraction of the population, stark disparity remains: Krimsky and Simoncelli estimate that adding arrestees would result in a database that contains roughly 19 percent of the African American male population, whereas roughly 5 percent of the white male population would be captured (Krimsky & Simoncelli, p. 260).

Krimsky and Simoncelli close their argument in two steps: first by debunking the various myths about the infallibility of DNA typing, and then by querying the actual efficacy of DNA databases. In perhaps the book's most important chapter, they ask whether massive DNA databases have actually delivered a return on their equally substantial capital investments. They observe that "[t]he assumption has been that the larger the data banks, the more crimes will be solved" (Krimsky & Simoncelli, p. 42). Yet the "investigations aided" figure often cited by database advocates tells us very little—for instance, it does not reveal whether the "aid" pointed to a suspect, whether the aid proved material to solving the crime, or whether a charge, conviction, or sentence resulted (Krimsky & Simoncelli, p. 307). Krimsky and Simoncelli raise the intriguing prospect that it is not expanding the known-offender database that will solve crime, but rather growing the crime scene sample database through improvements in the recovery of material from crime scenes (Krimsky & Simoncelli, p. 308). They also offer their own formula for gauging database success, even as they lament that many of their proposed key variables require data not released, and likely not even

gathered, by the government.¹⁸ Finally, *Genetic Justice* closes with ten axioms for a just forensic practice, which include aligning forensic and medical privacy practices, restricting databases to convicted felons, destroying samples, and imposing procedural hurdles on the collection of DNA from suspects or in dragnets (Krimsky & Simoncelli, pp. 330–35).

If *Genetic Justice* has a fundamental weakness, it is that its fears are mostly speculative or hypothetical. Krimsky and Simoncelli are constantly worried about what we do not know or what might happen. And even when concrete instances of abuse or mischief are offered, it is difficult to evaluate whether a given case represents the tip of an iceberg or simply an outlier. The book is full of compelling stories: the woman found to be a chimera after her child's DNA does not match her own (Krimsky & Simoncelli, pp. 301–02); the false cold hits; the innocent man publicly accused when he refuses to submit to a DNA dragnet (Krimsky & Simoncelli, p. 55); and the wrongful conviction and life imprisonment of a man despite DNA tests proving an exclusion (Krimsky & Simoncelli, pp. 129–32). But we simply cannot know how much to make of these illustrations, even as we recognize that the government is largely responsible for our ignorance, due to its refusal to act more transparently with regard to the development and use of DNA methods.

This lack of concrete information hinders any attempt to press the authors on whether the occasional bad cases are worth the benefits of the many good ones. I imagine that Krimsky and Simoncelli would respond that we do not even know exactly how much “good” DNA is doing. But assuming that the numbers were better crunched and the science sharpened, and assuming that the answer turned out to be “a lot,” I wonder whether that would occasion reconsideration of any of their closing recommendations. How much of their problem with DNA is truly with its efficiency, as opposed to some more profound reservation about the government staking a place in the genetics game?

Moreover, DNA is still very much an evolving science. *Genetic Justice* reveals as much, in that it speaks to techniques still not in popular use with the aim of prompting future circumspection in DNA practices. It is thus possible that some of its dark prophecies will never materialize: courts might find familial searches or arrestee databases unconstitutional,¹⁹ or prohibit testing of samples to discover more intimate genetic secrets.

18. Krimsky and Simoncelli propose measuring “crime-solving efficacy” by an equation that would multiply (1) the rate of crime scenes analyzed by (2) the rate of crime-scene profiles loaded per scene analyzed by (3) the rate of matches per loaded profile by (4) the rate of detection per match by (5) the rate of conviction per unit of detection. Krimsky & Simoncelli, pp. 310–15.

19. In fact, arrestee cases are presently being litigated across the country with varying outcomes. *See, e.g.*, *United States v. Mitchell*, 652 F.3d 387 (3d Cir. 2011) (reversing district court and holding arrestee sampling pursuant to federal law constitutional); *People v. Buza*, 262 P.3d 854 (Cal. 2011) (granting petition for review of appellate court decision holding arrestee sampling pursuant to California law constitutional). *Cf.* *United States v. Pool*, 621 F.3d 1213 (9th

But even if the permissive state of affairs today were to endure, then it remains to ask whether those who favor liberty must then accede to pragmatic compromise. To give an example: if in fact a person exculpated by DNA testing but inculpated by other evidence will only be exonerated if the state can identify an actual perpetrator (as in the Daryl Hunt case detailed in the book (Krimsky & Simoncelli, pp. 129–32)), then does that justify the expansion of databases to ensure that the innocent go free? Krimsky and Simoncelli would argue that it is wrong to condition exoneration on a suspect's ability to identify an actual perpetrator, but if they cannot convince others to see things the same way, then is it more wrong to let an innocent person languish in jail in order to preserve an amorphous privacy or liberty interest against suspicionless DNA typing?

B. IN THE COURTS: DOUBLE HELIX

Where Krimsky and Simoncelli portray DNA typing as a technology run amok, evading careful scrutiny and operating on the basis of assumptions and blind faith, Kaye sees DNA as a science that, once it found its way to court, underwent unprecedented, albeit often undisciplined, judicial scrutiny. The purpose of his book is to “show[] how the adversarial process affected arguments not only in courtrooms but also in the scientific community” (Kaye, p. 3). The story told in *Double Helix* is familiar largely from various academic accounts, but it is most strongly reminiscent of Jay Aronson's in-depth recounting of the DNA wars in his book *Genetic Witness*.²⁰ Nevertheless, there are key differences that set *Double Helix* apart.

Kaye starts his tale much earlier than Aronson's, using the cases around the earliest blood-based identification methods like ABO and antigen typing to lay a foundation for the kind of technical questions, and legal culture, that DNA likewise confronted.²¹ He starts by criticizing *State v. Damm*,²² in which the first court to rule on the admissibility of blood typing evidence upheld the refusal of the trial court to order a blood test requested by the defendant. The court relied largely on a newspaper article describing lawyerly skepticism toward the method and the lack of uniform acceptance of the test's reliability, even though, as Kaye points out, “[t]hat a scientific test is not yet in use in the courts of every country hardly shows it lacks acceptance in the scientific community” (Kaye, p. 11). Kaye notes that this reasoning seemed to parallel that of *Frye v. United States*,²³ which ten years earlier had set a standard of “general acceptance” for testing the admissibility of scientific evidence (Kaye, p. 9). *Frye* similarly involved a defendant's request for admission—in that case, of a primitive lie detector test—that the

Cir. 2010) (reversing trial court and holding arrestee sampling unconstitutional), *vacated*, 659 F.3d 761 (9th Cir. 2011) (en banc) (vacating opinions as moot after defendant's guilty plea).

20. ARONSON, *supra* note 4.

21. These two early forms of blood typing relied on tests that identified individuals by the antibodies and antigens carried in their blood. Kaye, pp. 6, 12.

22. 252 N.W. 7 (S.D. 1933), *aff'd on reh'g*, 266 N.W. 667 (S.D. 1936).

23. 293 F. 1013 (D.C. Cir. 1923).

court rejected as “lack[ing] the requisite standing and scientific recognition among . . . psychological authorities” (Kaye, p. 10; internal quotation marks omitted).

Kaye then recounts the tale of what he cleverly calls the “the protein wars,” a presage to the hyperbolically labeled “DNA wars” that were to come (Kaye, p. 5). Specifically, he describes the fight over the admissibility of thin-gel electrophoresis, a precursor to the kind of methods used for later DNA typing, and that was developed largely for crime laboratory use (Kaye, pp. 13–18). Although the majority of courts admitted the technique, often with little to no opposition or discussion of its reliability, a handful of courts applied closer scrutiny (Kaye, p. 14). Of those, one court found the method not “generally accepted,” citing the absence of validation studies conducted by scientists outside the law enforcement community.²⁴

In parallel, Kaye introduces the early “trial by math” cases, which foreshadowed the concepts that surfaced in the debate about the use of statistical figures to quantify the significance of a DNA match. For instance, likely influenced by the well-known California case of *People v. Collins*,²⁵ the Minnesota Supreme Court nearly came to the point of holding that “[a]ll numbers . . . were banished from the criminal courts in Minnesota” (Kaye, p. 31). Luckily, however, Minnesota was singular, and other jurisdictions admitted such evidence more freely (Kaye, p. 32).

The bulk of the text that follows this early history is devoted to unpacking the admissibility issues surrounding DNA typing in its various noodles of alphabet soup: RFLPs, VNTRs, DQ α , and so on.²⁶ Kaye divides the periods into five legal waves: (1) unchallenged admission (Kaye, p. 65); (2) the questioning of methodology and practice, particularly at private labs like Cellmark and Lifecodes, and as exemplified by the decision in *People v. Castro*;²⁷ (3) objections to the statistics used to quantify the match, including the potential for prejudice (Kaye, pp. 79, 107); (4) attacks on the legitimacy of the product rule in the wake of the 1992 NRC report (Kaye, p. 103); and finally, (5) the détente (Kaye, p. 158).

The first wave of cases entailed “exuberant and essentially uncontested claims from the prosecution” (Kaye, p. 65), which were in turn embraced by the courts. But soon thereafter, fissures began to emerge over topics including (among others) proper laboratory protocol, the accuracy of population

24. *People v. Young*, 391 N.W.2d 270 (Mich. 1986).

25. 438 P.2d 33 (Cal. 1968). *Collins* is known to every law student who took a class on evidence as the “interracial, girl-with-a-ponytail, man-with-a-mustache, yellow-car” case.

26. Restriction Fragment Length Polymorphism (“RFLP”) testing was an early method of DNA typing that entailed measuring long fragments of DNA known as variable nucleotide tandem repeats (“VNTRs”), commonly by using a gel and autorads. It has largely been replaced by a method known as polymerase chain reaction (“PCR”), which amplifies smaller quantities of DNA through a replication process and then measures them, typically for short tandem repeats (“STRs”), using a technique known as capillary electrophoresis. DQ α is simply one kind of kit to test for specific loci; there are many others commercially available for law enforcement use. Kaye, Chapter Three & p. 180.

27. Kaye, pp. 74–75 (citing *Castro*, 545 N.Y.S.2d 985 (Sup. Ct. 1989)).

genetics models, the prejudice caused by introducing such dauntingly large statistics, divergent NRC reports, and the question of how to factor in error rates. Although these conflicts were at times heated and unprecedented in the annals of forensic evidence, it is important not to overstate their actual legal effect. As Kaye acknowledges, only a handful of cases ultimately resulted in evidence being excluded,²⁸ and the colorful hearings that distinguished cases like *People v. Castro*, *United States v. Yee*,²⁹ and the O.J. Simpson case were the exceptions, not the rule. Rather, as Kaye states, “Typical[] defense lawyers do not have the expertise, time, and resources to scrutinize the state’s scientific evidence,” and “[e]ven today, many potential problems with DNA evidence in specific cases probably go unnoticed.”³⁰ Indeed, even when judges presided over hotly contested hearings and credited both sides as convincing, they often nonetheless admitted the evidence.³¹

The final third of the book covers the post-war period, from the issuance of a peace paper authored by two early adversaries in the fight through the emergence of the form of DNA testing most commonly used today—short tandem repeat (“STR”) testing using a technique known as polymerase chain reaction (“PCR”). This part includes brief chapters on the problems of racial classifications, Y-chromosome STRs (“Y-STRs”), and mixtures, all of which serve secondarily as platforms for Kaye to prefer his own views on how to handle each problem.³² He also takes a short detour into mitochondrial DNA typing, which affords an opportunity to introduce several studies of jurors’ treatment of scientific evidence (Kaye, pp. 238–39).

Kaye closes with some “lessons” from the experience of forensic DNA testing. He describes the quickening pace of technological development as at odds with the instantaneous gratification demanded by legal structures, using DNA as a template for forensic science’s legal and epistemic problems (Kaye,

28. See, e.g., *Commonwealth v. Lanigan*, 596 N.E.2d 311 (Mass. 1992) (cited at Kaye, p. 108, as representative of handful of cases that rejected product rule); *State v. Schwartz*, 447 N.W.2d 422 (Minn. 1989) (cited at Kaye, p. 75); see also Kaye, p. 94 (“These occasional defense victories notwithstanding, most courts continued to find general acceptance or scientific validity.”). Indeed, the most successful cases for the defense revolved around the debates about the accuracy of the statistics used to quantify the significance of a match, but even when courts held the product rule inadmissible, they often left open the possibility that the interim ceiling principle, a more conservative calculation, might still be allowed. Kaye, p. 109.

29. 134 F.R.D. 161 (N.D. Ohio 1991).

30. Kaye, p. 72. *But see* Kaye, p. 142.

31. See, e.g., Kaye, p. 75 (discussing *United States v. Jakobetz*, 747 F. Supp. 250 (D. Vt. 1990), *aff’d*, 955 F.2d 786 (2d Cir. 1992)); Kaye, p. 95 (discussing *Yee*, 134 F.R.D. 161); Kaye, pp. 106–07 (discussing *People v. Axell*, 1 Cal. Rptr. 2d 411 (Ct. App. 1991)).

32. E.g., Kaye, p. 197 (“The rules of evidence should allow these ‘deracialized’ statistics to be used, but neither evidence doctrine nor scientific knowledge dictates that this be done.”). As in his other work, Kaye also champions likelihood ratios and Bayesian analysis as a valuable way of presenting and weighing the probative value of evidence. See, e.g., Kaye, p. 27 (introducing Bayesian analysis); Kaye, pp. 82–83 (noting errors up to 0.5 percent in prior probability are likely to favor the defendant); Kaye, pp. 174–75 (discussing Bayesian analysis in context of recent case).

p. 244). The legal problems stem from the difficulty in defining the standard for admissibility, which he likens to an ordinary doctrinal question that will be answered over the course of incremental adjudication (Kaye, p. 245). As for the epistemic problems, Kaye identifies four core concerns: the expert-for-hire problem; the problem of expert availability and cultivation; the isolation of forensic science and forensic testimony from scientific and professional accountability; and the near impossibility of identifying a truly neutral expert (Kaye, pp. 245–56). In the end, consistent with his approach throughout the rest of the book, his strongest normative recommendation is “the creation of incentives for the forensic scientists or technicians working in the laboratory and testifying in the courtroom to get it right in the first place and to avoid slipping into the role of advocates,” which he acknowledges would entail substantial institutional reform (Kaye, p. 259).

Throughout the text, Kaye marches through each set of challenges with a tone that is part Joe Friday and part impatient. His precise perspective is distinctly singular and starkly favors outcome over process. He neither wholly endorses nor largely rejects DNA technologies, but rather formulates his own view of the validity of particular challenges and then gently dismisses those who advance arguments he deems unmeritorious. Accordingly, while he is scornful of courts shirking their gatekeeping function, he ultimately appears untroubled by such abnegation so long as he considers an objection baseless. One senses that, where an objection leads to further interrogation that only confirms conventional wisdom, Kaye views that objection as wasting time all around. At the same time, however, he chastises courts for effectively accepting any evidence proffered to them.

Given his preference for the end over the means, Kaye is not reflexively pro-prosecution in the sense that he supports everything the government does or says, but he still ultimately has greater faith in law enforcement than he does in the adversarial processes intended to check it. For example, throughout his accounts of the DNA wars, he notes, among other things, that the government relied on evidence based on studies that were “unpublished and apparently unreplicated” (Kaye, p. 93), proffered experts claiming infallibility in identification (Kaye, pp. 63, 109–10), relied on techniques that lacked “published data regarding . . . methodology” (Kaye, p. 75), opposed making the results of proficiency tests available to the court (Kaye, p. 166), and “refused to make its database public” (Kaye, p. 94). Yet none of these seems to deeply trouble Kaye, or warrant a sanction as dramatic as exclusion of evidence, because he views such process-based concerns as superfluous so long as they do not affect the reliability of the ultimate results. This strain of contrarianism is perhaps exemplified by an argument Kaye has made elsewhere encouraging the government to make its databases accessible: he advocates transparency not because it might reveal some important flaw in current methods, nor because good scientific practice demands it, but because there is nothing to hide—the

databases, he believes, will simply affirm that all the government has said has been true and will silence irrepressible critics.³³

Although Kaye may be right about the ultimate outcomes, some might nevertheless argue that his trust is too generously placed. For example, while Kaye is comfortable (and right) in assuming that defense lawyers will pursue exclusion of evidence at any cost, he never considers that law enforcement actors might pursue convictions with the same zeal.³⁴ He rarely assails the ethics or integrity of prosecutors or government scientists, and refrains from criticizing the government for its closed approach to science to the same extent as do others detailing the same events.³⁵ At times, he seems to willfully ignore the prosecutor's role in enabling shoddy evidence to be introduced, regardless of whether the prosecutor sought admission with good intentions.³⁶ Instead, most of his animus is reserved for the other players in the process—primarily for judges who are either too willing or not willing enough to subject the science to serious

33. David H. Kaye, *Trawling DNA Databases for Partial Matches: What Is the FBI Afraid Of?*, 19 CORNELL J. L. & PUB. POL'Y 145, 170–71 (2009) (“A policy of openness will permit a robust inquiry that will ultimately produce either greater confidence in the method now used to estimate RMPs, or some more defensible form of these estimates.”).

34. He acknowledges that “[p]rosecutors do not usually seek out errors or questionable judgments by laboratories,” Kaye, p. 257, but virtually ignores prosecutors who encourage and exploit nonscientific methods, even while he disdains defense lawyers who raise frivolous claims. Aronson, in contrast, repeatedly raises these questions. See, e.g., ARONSON, *supra* note 4, at 120–21.

35. Aronson, for example, criticizes the Federal Bureau of Investigation for choosing to develop its technologies behind closed doors with clear stakeholders, rather than openly through a panel of diverse and neutral actors, ARONSON, *supra* note 4, at 93, and questions whether the FBI accelerated its efforts to supersede the private sector, *id.* at 96. He notes that prosecutors used a deliberate strategy to control who was considered a “legitimate” expert for forensic DNA. *Id.* at 121. He also describes a high degree of cooperation between the prosecutors and the scientists that endorsed and developed the typing methods, *id.* at 43, suggesting a greater professional incentive and ideological bias than that acknowledged by Kaye. Compare Kaye, pp. 246–47 (discussing financial interest of experts, and correctly observing prosecutors’ successful attempts to discredit defense without acknowledging legitimacy of defense counterattacks), and Kaye, pp. 248–49 (discussing only defense selective cultivation of experts), with ARONSON, *supra* note 4, at 111–12, 124, 142–43, 144. Aronson also takes time to describe the FBI’s resistance and ultimate success in exempting itself from New York’s strict quality control regulations, ARONSON, *supra* note 4, at 93, gives greater detail about its strong-arm tactics in eliciting the second National Academy of Sciences report, *id.* at 169, and recounts the FBI’s efforts to insert a last-minute simultaneous “reply” to a defense-oriented *Science* article, *id.* at 139. To give one example, Rockne Harmon, a California prosecutor who aggressively hounded defense experts outside the courtroom, receives several pages of attention from Aronson, *id.* at 142–43, while Kaye describes him only as “sometimes accused of strong-arm tactics in his advocacy of DNA typing.” Kaye, p. 186.

36. For instance, with regard to the early cases involving inexcusably shoddy lab work, Kaye all but ignores the prosecutor’s role in checking the integrity of its evidence, mentioning only a prosecutor who was so frustrated that he threatened not to pay any more of the laboratory’s bills. Kaye, p. 74.

scrutiny,³⁷ and to a lesser extent for the defense lawyers and experts who raise objections that he views as trivial.³⁸

Given Kaye's distaste for the opportunism that characterizes the actors in the adversarial process, it is odd that he holds back from assessing the politics of the cases as directly as he confronts the politics of the adversaries trying them.³⁹ For instance, despite routinely reciting the underlying and often gruesome facts of individual cases, he never suggests that the outcome of a case might be predicted by something other than law (such as a desire to secure conviction in a rape or murder). Conversely, he does not consider that the institutional position of a new method's evidentiary proponent may play an important role in a court's receptiveness to unproven technologies. He thus treats the exclusion of ABO typing in *Damm*,

37. See, e.g., Kaye, p. 118 (describing a court as having misunderstood a point and thus misconstruing testimony); Kaye, p. 157 (gently mocking one chief justice who referred to Budowle and Lander as "Boodles and Louder" during oral argument); Kaye, p. 193 (describing the many decisions culminating in *People v. Pizarro*, 3 Cal. Rptr. 3d 21 (Ct. App. 2003), as a "misadventure"); Kaye, p. 276 n.2 (noting court succumbed to transposition fallacy). *But see* Kaye, p. 64 (excusing the courts for the early spate of unquestioned admission of DNA, writing that they "can hardly be faulted for responding to the lopsided records before them by finding sufficient general acceptance or scientific validity to justify the admission of the DNA profiling").

38. See, e.g., Kaye, p. 118 (describing a court as having misunderstood a point and thus misconstruing testimony); Kaye, p. 157 (gently mocking one chief justice who referred to Budowle and Lander as "Boodles and Louder" during oral argument); Kaye, p. 193 (describing the many decisions culminating in *People v. Pizarro*, 3 Cal. Rptr. 3d 21 (Ct. App. 2003) as a "misadventure"); Kaye, p. 276 n.2 (noting court succumbed to transposition fallacy); *see also* Kaye, pp. 75, 95 (discussing the *Jakobetz*, *Yee*, and *Axell* cases). Kaye often expresses subtle dismay at judges who credit the contrary perspectives presented to them, yet nonetheless disregard the inherent conflict in order to admit needed evidence. See, e.g., Kaye, p. 106 ("In the face of powerful criticism from defense experts, the court still managed to find general acceptance."). *But see* Kaye, p. 64 (excusing the courts for the early spate of unquestioned admission of DNA, writing that they "can hardly be faulted for responding to the lopsided records before them by finding sufficient general acceptance or scientific validity to justify the admission of the DNA profiling").

39. Perhaps this is a product of his own ambivalence about the value of process when it ultimately proves unnecessary. For example, in discussing the Michigan Supreme Court's rejection of an early typing system on the basis of a lack of external scientific validation studies, Kaye seems both approving and disapproving of the court's approach. On the one hand, he acknowledges that generally "it is vital to ask not merely whether the law-enforcement community generally accepts a new scientific test, but whether this community can present a satisfactory scientific basis for believing that the test works as advertised." Kaye, pp. 16-17. Yet he goes on to suggest that courts found the scientist associated with questioning its legitimacy "imprudent" and "idiosyncratic" in his analyses, especially when an FBI study contradicted some of his cited concerns. Kaye, p. 18. This comes up again when he notes that other studies undertaken to silence defense arguments also bore out as expected. See, e.g., Kaye, p. 94 ("In time, statistical studies aplenty would confirm that population structure was not a significant problem . . ."); Kaye, pp. 124-25 (referring to simulations conducted in response to criticisms). Kaye does not reveal whether he thinks that confirmatory results rendered the initial arguments imprudent, or whether he feels it is unfortunate that it requires an adversarial contest to ensure that the studies are ever done.

offered by the defendant as exculpatory proof,⁴⁰ as a legal and sociocultural event of equal significance to the exclusion of evidence of guilt when proffered by the government in *State v. Schwartz*.⁴¹

Kaye's unexpected formalism in this regard makes his assertion that "[t]he judicial response to this dynamic [of rapidly evolving science] is the exclusion of scientific evidence . . . on the ground that it has not been shown to be scientifically valid or generally accepted as valid in the scientific community" (Kaye, p. 244) ring somewhat hollow. First, his own narrative demonstrates that scientific evidence, when proffered by the government, is in fact rarely rejected by the courts. Even a disagreement as stark as a "debate between . . . the professor from Harvard . . . and . . . the professor from Yale," could not suffice to fail the standard of "general acceptance" necessary to bar evidence from admission (Kaye, p. 94). Second, and perhaps even more tellingly, that same solicitude for untested science has rarely been shown toward evidence tendered by the defense. Of the fourteen or so "sciences" that Kaye lists *Frye* and *Daubert* as having excluded, roughly half of those were offered by the defense, not the prosecution.⁴² And while that may superficially suggest that the odds are even, in fact it masks a long and storied history of courts admitting notoriously nonscientific techniques at the request of prosecutors.⁴³ To tell a

40. Kaye, p. 12 (discussing *State v. Damm*, 252 N.W. 7 (S.D. 1933), *aff'd on reh'g*, 266 N.W. 667 (S.D. 1936)).

41. 447 N.W.2d 422 (Minn. 1989). Compare Kaye, p. 12, with Kaye, p. 74–75. Kaye is likewise baffled when the court, on rehearing, concedes that the evidence is reliable but nevertheless keeps it out on a procedural ground. Kaye, p. 12 (identifying it as a "triumph of form over substance" when the court nonetheless refused to order exculpatory tests because the defendant's expert had not explicitly addressed the standard of general acceptance). Similarly, Kaye does not comment on the political dimension of a case like *State v. Bible*, 858 P.2d 1152 (Ariz. 1993), in which the Arizona Supreme Court held that the introduction of the DNA evidence was an error (because of the debate surrounding the product rule), yet found it harmless and affirmed the conviction. See Kaye, p. 109.

42. Specifically, the *Frye* defense sought the introduction of evidence in cases involving polygraphing. *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923); cf. *United States v. Scheffer*, 523 U.S. 303 (1998) (finding constitutional right to a defense not impinged by per se rule prohibiting polygraph evidence); *People v. Ebanks*, 49 P. 1049, 1053 (Cal. 1897) (hypnosis); *People v. John W.*, 229 Cal. Rptr. 783 (Cal. Dist. Ct. App. 1986) (penile plethysmography); *Commonwealth v. Neal*, 464 N.E.2d. 1356, 1364–65 (Mass. 1984) (retesting of breath alcohol); *State v. Anderson*, 379 N.W.2d 70, 79 (Minn. 1985) (graphology). The repressed-memory case, *Franklin v. Stevenson*, 987 P.2d 22 (Utah 1999), was a civil action, in which the plaintiff was the party who sought introduction. Kaye does qualify his statement that "a wide array of scientific and pseudoscientific techniques have been excluded" with "at some point in at least some jurisdictions," Kaye, p. 244, but he nonetheless suggests that courts have both energetically excluded bad science and done so evenhandedly, when in fact history suggests that neither of these is the case.

43. See, e.g., COMM. ON IDENTIFYING THE NEEDS OF THE FORENSIC SCI. CMTY., NAT'L RESEARCH COUNCIL, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 11, 99 (2009) (noting that "the vast majority of the reported opinions in criminal cases indicate that trial judges rarely exclude or restrict expert testimony offered by prosecutors," and yet "many forensic techniques . . . were developed empirically within the forensic community, with little foundation in scientific theory or analysis"); Paul C. Giannelli, *The*

story about science and the courts, then, seems woefully incomplete without also providing some commentary on the politics of criminal justice more generally.

* * *

In sum, more than simply addressing different aspects of DNA practices, *Genetic Justice* and *Double Helix* reveal divergent views of the system in which forensic evidence operates. Whereas *Genetic Justice* views the law and the lawyers that help shape it as allies and protectors in the deployment of science in criminal justice, *Double Helix* distrusts them and views the system as easily manipulated. Whereas *Genetic Justice* views DNA as the likely latest installment in a long history of forensic methods first exalted but inevitably embarrassed, *Double Helix* sees DNA as more inclined to be embarrassed by its skeptics than by its promoters. And whereas *Genetic Justice* views the science of DNA as inextricably bound with the values of the criminal justice system generally, and thus sees ideology everywhere, *Double Helix* believes that the science itself can be segregated from its forensic practice, and that it is only the latter that can corrupt the former.

II. BEYOND POLITICS

These two books, considered together, paint a picture of the controversies that DNA can generate from collection to conviction, and in so doing provide insight into the inherently political nature of forensic evidence. But they do not diverge in every respect. Even though the authors have differing views of the exact source of the problem, and thus of the proper balance to strike among reforms in order to make them maximally effective, the books share some critical and revealing commonalities. Specifically, both books conclude that improving the use of forensic evidence by the criminal justice system requires greater transparency, enhanced quality assurance mechanisms, and meaningful separation between science and law enforcement.

For Kaye, successfully safeguarding DNA evidence requires greater accountability outside of, not within, the courtroom. For example, in discussing the escalating rhetoric and hyperbolic claims of experts in hear-

Abuse of Scientific Evidence in Criminal Cases: The Need for Independent Crime Laboratories, 4 VA. J. SOC. POL'Y & L. 439, 458-62 (1997) (discussing wide-ranging problems in forensic science, including courts' admission of testimony without scientific basis); Paul C. Giannelli, *Forensic Science*, 34 J.L. MED. & ETHICS 310, 310-11, 313 (2006) ("Nevertheless, despite its obvious value, forensic science has not always merited the term 'science.' . . . [M]any forensic techniques achieved judicial acceptance before the demanding *Daubert* standards were operative. Consequently, empirical support for many techniques is often lacking, a fact that makes the need for basic research a pressing concern."). The closest Kaye comes to acknowledging a political backdrop to cases is when he refers to Eric Lander's surprising cooperation with his former adversary, Bruce Budowle of the FBI, in resolving a key issue. Kaye, pp. 154-56. Kaye argues that their joint statement was arguably "carefully calculated to come out right before the DNA hearings for the Simpson case." Kaye, p. 156 (quoting scientist Jerry Coyne) (internal quotation marks omitted).

ings, Kaye posits that “[t]he separation of professional reputation from courtroom behavior removes the normal incentive for the expert . . . to be intellectually rigorous” (Kaye, p. 251). And yet he is uncertain that greater exposure would have a “disciplining effect,” rather than simply resulting in more vigorous asseverations (Kaye, p. 251). Similarly, although Kaye describes “[q]uality-assurance standards” as “vital to prevent mistakes” (Kaye, p. 72) and laments that the controversies surrounding the 1992 NRC report resulted in some of its most important recommendations concerning laboratory performance to be “all but lost in the reaction” to the report’s population genetics issues (Kaye, p. 255), he does not criticize courts that rejected defense arguments to read the 1992 NRC Report as requiring many such standards as a necessary precursor to admissibility (Kaye, p. 245).

Instead, Kaye correctly observes that:

[M]ost of the problems with DNA testing have not been errors of high theory or the introduction of methods that did not work. Rather, they have been production-line problems in the generation of the evidence for specific cases—from overselling a particular interpretation of a mixture . . . to outright lies by analysts about their bench work. (Kaye, p. 257)

Because he deems the adversarial system ill-equipped to uncover such problems, “[t]he most promising line of attack . . . is the creation of incentives for the forensic scientists or technicians . . . to get it right in the first place and to avoid slipping into the role of advocates” (Kaye, p. 259). Such a cultural shift would require a host of reforms, including “separating laboratories from the police; fostering competition among laboratories; requiring auditing, proficiency testing, and regulation of laboratories; supplying more expert services to defendants; and demanding more awareness and action to discourage prosecutors from using dubious scientific evidence” (Kaye, p. 259). While some of these speak to the education and enablement of litigants, most are aimed directly at the laboratories themselves, thus bypassing the law. He distinctly disavows the use of legal admissibility standards, such as conditioning admissibility on the incorporation of error rates as part of statistical analysis, as a means of prompting necessary reform (Kaye, p. 166–70).

Genetic Justice also urges greater transparency in the use of genetic information, although the book’s authors are more content to rely on the legal system to attain it. Krinsky and Simoncelli repeatedly note how many significant decisions about DNA collection and testing are made by laboratory directors or law enforcement personnel, rather than through legislative action or even executive order (Krinsky & Simoncelli, pp. 37, 76). They also use their international expertise to highlight the particular insularity of the U.S. system. This comes as no surprise to DNA scholars, who often must rely on the United Kingdom for empirical assessments of DNA practice.⁴⁴ Krinsky and Simoncelli observe that “British criminal justice authorities overseeing the U.K. [National DNA Database] were, from a relative

44. See, e.g., Krinsky & Simoncelli, p. 295 (citing William C. Thompson).

standpoint, transparent in providing information about” their database, unlike the position taken by American authorities regarding their own database.⁴⁵

Accordingly, the axioms advanced in *Genetic Justice* almost all speak to legal standards that encourage greater restraint and accountability. Among other things, the authors set forth several recommendations specific to the procedural issues raised in the text: for example, the alignment of medical and forensic privacy practices (Krimsky & Simoncelli, p. 330); the destruction of genetic samples (Krimsky & Simoncelli, p. 241); and limitations on the scope of mandatory sampling programs (Krimsky & Simoncelli, p. 332). And although it is unclear whether they view the courts or the legislature as the primary instrument for implementing such reforms, Krimsky and Simoncelli clearly are content to rest greater faith in the legal system as a whole.

Thus even though each book addresses different moments in the life cycle of forensic DNA typing, and even though the authors dramatically differ in their trust of the government’s use of these methods, everyone agrees that many of the core problems with forensic DNA as practiced today could be alleviated with the imposition of even minimal standards of scientific transparency.

CONCLUSION

Forensic evidence, and particularly DNA typing, is obviously here to stay. On any given day, news sources are full of stories about some new mind-boggling scientific development. Sadly, however, revelations of laboratory malfeasance, errors, or sloppy mistakes are as common as stories about the use of forensic science to convict a dangerous criminal or exonerate an innocent accused.

Despite the differences between these two books, they might be said to tell a single story, although that story is told indirectly. In the course of urging greater circumspection in the face of expansive investigative uses of genetic information, *Genetic Justice* impresses on us all the things that we, as a society, do not know about forensic DNA. And in the course of chastising the legal system for its indelicate and even corruptive management of forensic evidence admissibility questions, *Double Helix* in effect shows us why we do not know it.

Genetic Justice reveals a highly decentralized, incremental approach to DNA policymaking in the absence of hard data about actual efficacy. *Double Helix* then recounts a history of DNA admissibility battles—a history replete with demands for the generation and disclosure of such data—yet acknowledges that time and time again those demands went unmet. Courts rarely condition admissibility on the production or disclosure of the sought-after information, and at times do not even require demonstration of basic thresholds of competence before admitting evidence. Some may see the de-

45. Krimsky & Simoncelli, p. 185; see, e.g., Krimsky & Simoncelli, pp. 267–68, 307.

velopment of the science, its execution, and its eventual evidentiary admissibility as legally distinguishable moments, but read together, these two texts illustrate why they are not. In forensic science, the court is often the only party with enough power and incentive to force conformity to scientific methods.

If any common theme thus emerges from these two very different books and their disparate views of the role of DNA testing in criminal justice, it is that the current system affords too much protection to government actors from external scrutiny. But as scholars have said for decades, this need not be the case. Implementation of the kinds of reforms suggested by Kaye would go far to improve the quality of evidence processed by laboratories, and might even incidentally advance knowledge about sound methodological practice. Adoption of the axioms of just forensic practice outlined by Krimsky and Simoncelli would dramatically decrease the reach of forensic databases and the nature of genetic investigations, but it might also actually improve law enforcement efficacy.

Of course, even if society undertook both sets of reforms, it is hard to imagine that DNA typing, or any forensic discipline for that matter, will suddenly become a truly “neutral” science unaffected by the politics of criminal justice, whether in or out of the courtroom. By design, forensic evidence is part of the adversarial system, and thus it will always be a landscape on which each side seeks to plant its flags. But if we cannot hope that forensic science will be neutral, then who is to say it might not still be a bit more bipartisan?

