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**Health Matrix: The Journal of Law-  
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Volume 8 | Issue 2

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1998

# DNA Blueprints, Personhood, and Genetic Privacy

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# DNA BLUEPRINTS, PERSONHOOD, AND GENETIC PRIVACY

*Hugh Miller, III*†

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## I. INTRODUCTION

**“WE USED TO THINK OUR FATE** was in our stars. Now we know, in large measure, our fate is in our genes.”<sup>1</sup> So says James Watson, who co-discovered the double-helix struc-

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1. James Watson, quoted in Leon Jaroff, *The Gene Hunt*, TIME, Mar. 20, 1989, at 62, 67.

ture of DNA<sup>2</sup> with Francis Crick in 1953. Crick, for his part, makes contemporary headlines with his “[a]stonishing [h]ypothesis that ‘You,’ your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the [genetically determined] behavior of a vast assembly of nerve cells and their associated molecules.”<sup>3</sup> In a similar vein, the prominent Harvard biologist Walter Gilbert asserts that understanding human genetic structure is “the ultimate answer to the commandment ‘Know thyself.’”<sup>4</sup> Gilbert is one of the scientific leaders who fronts the Human Genome Initiative, a fifteen-year federally funded research project inaugurated in 1991.<sup>5</sup> The Human Genome Initiative aims to produce a complete map of the DNA structure of all human genes early in the 21st century. Gilbert likens this ambitious scientific project to a quest for the “Holy Grail” of human identity. Upon the project’s completion, Gilbert says, each individual will be able to fish from his pocket a computer disk containing genetic information and announce: “Here is a human being; it’s me!”<sup>6</sup> Proclamations by scientific leaders like these suggest that the march of genetic science threatens to transform our idea of personal identity into an essentially genetic concept. Indeed, a recent book by Doro-

2. The acronym DNA stands for deoxyribonucleic acid, the hereditary molecule that encodes the genetic blueprints of all living creatures on earth. See J. D. Watson & F. H. S. Crick, *Genetical Implications of the Structure of Deoxyribonucleic Acid*, 171 NATURE 964, 964 (1953).

3. FRANCIS CRICK, THE ASTONISHING HYPOTHESIS: THE SCIENTIFIC SEARCH FOR THE SOUL 3 (1994) (internal quotation marks omitted). For a newspaper account of Crick’s recent work, see Sheryl Stolberg, *Chasing the Mysteries of Life: After You Have Helped Crack the Code for DNA, What’s Next?*, L. A. TIMES, Feb. 28, 1994, at A1.

4. JERRY E. BISHOP & MICHAEL WALDHOLZ, GENOME 218 (1990) (quoting Walter Gilbert, Professor of Biology at Harvard University).

5. The Human Genome Initiative is funded with public money by the U.S. Congress and coordinated by the National Institutes of Health and the United States Department of Energy. For descriptions of the project, see Leslie Roberts, *Report Card on the Genome Project*, 252 SCIENCE 376 (1991); James D. Watson, *A Personal View of the Project*, in THE CODE OF CODES: SCIENTIFIC AND SOCIAL ISSUES IN THE HUMAN GENOME PROJECT 164, 167-70 (Daniel J. Kevles & Leroy Hood eds., 1992) (hereinafter CODE OF CODES) (describing Watson’s views of the rationale supporting the Human Genome Project and its goals). Concurrent research efforts to map the human genome are being pursued in other countries. See generally MEDICAL RESEARCH COUNCIL, HUMAN GENOME RESEARCH: A REVIEW OF EUROPEAN AND INTERNATIONAL CONTRIBUTIONS (Diane J. McLaren ed., 1991).

6. Walter Gilbert, *A Vision of the Grail*, in CODE OF CODES 83, 96 (describing the difficult and potentially frightening realization that humans may encounter once realizing that we are determined by a “finite collection of information”).

thy Nelkin and Susan Lindee documents a tide of media and literary evidence indicating that DNA is assuming a cultural meaning similar to that of the Biblical soul. Nelkin and Lindee conclude that “[j]ust as the Christian soul has provided an archetypal concept through which to understand the person and continuity of self, so DNA appears in popular culture as a soul-like entity, a holy and immortal relic, a forbidden territory.”<sup>7</sup>

The idea that DNA determines the essence of personal identity raises novel legal issues for the protection of an individual’s right to privacy. In privacy terms, genetic information is like ordinary medical information about an individual. Much of the information encoded in a person’s DNA molecules has, or will prove to have, medical applications for the prevention and treatment of diseases. But genetic information is potentially more sensitive than ordinary medical information.<sup>8</sup> According to scientific leaders like Watson, Crick, and Gilbert, our genes determine who we are and how we behave. If we accept this invitation to transform the concept of personal identity into genetic terms, genetic information should presumably merit special legal protection under the right to privacy — notwithstanding any of its purely medical applications. Legislatures and courts would then be called upon to treat DNA information with a singular reverence befitting its alleged status as the repository of an individual’s inviolate personality. In light of widespread popular and scientific opinion, it might appear foolhardy to argue against the idea that an individual’s DNA blueprint deserves special legal protection as the essential encoder of his personal identity. Nevertheless, such is the thesis I shall defend in this Article.

In brief, I shall argue that advances in genetic science cannot warrant any transformation of the traditional idea of personal identity into essentially genetic terms. My account is premised on the observation that the idea of personal identity bears internal relations to the concepts of free will and moral

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7. DOROTHY NELKIN & M. SUSAN LINDEE, *THE DNA MYSTIQUE: THE GENE AS A CULTURAL ICON* 41 (1995).

8. For a discussion of the similarities and differences between genetic information and ordinary medical information, see George J. Annas, *Privacy Rules for DNA Databanks: protecting Coded ‘Future Diaries,’* 270 JAMA 2346 (1993).

responsibility. Genetic science may shed new light upon factors that causally condition the development of personality through the power of free choice. But future advances in genetic science cannot displace the traditional idea of personal identity without nullifying our customary concepts of free will and moral desert. Insofar as we retain some space of action for free will, our traditional concept of personal identity remains justifiably impervious to encroachment by genetic science. Or so I shall argue. My thesis will be developed in stages. In Part I of this Article, I discuss the legal implications of genetic science and review the arguments for giving DNA information heightened protection under the right to privacy in particular. In Part II of the Article, I analyze the concept of personal identity in light of traditional ideas and philosophical theories of personhood. In Part III, I evaluate the relation of genetic information to the concept of personal identity. I conclude that DNA structure should not be conflated with the essence of a person's identity. Instead, the essence of personal identity inheres in contingent facts about what the individual has chosen to do with his life of his own free will. In the Conclusion, I shall sketch some legal implications of this view for the protection of genetic information under the right to privacy. I conclude that privacy interests in genetic information should be treated much the same as privacy interests in ordinary medical information.

## II. GENETICS AND THE RIGHT TO PRIVACY

### A. Legal Implications of the New Genetic Science

In 1953 James Watson and Francis Crick made their famous discovery of the double-helix structure of deoxyribonucleic acid, or DNA.<sup>9</sup> DNA is the molecule that encodes the hereditary genetic traits of all living creatures on earth.<sup>10</sup> In the 1970s, additional scientific discoveries about principles of recombinant DNA analysis<sup>11</sup> heralded the advance of sophisti-

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9. *Id.*

10. *See* Watson & Crick, *supra* note 2.

11. *See, e.g.*, Allen M. Maxim & Walter Gilbert, *A New Method for Sequencing DNA*, 74 PROC. OF THE NAT'L ACAD. OF SCI. 560 (1977) (describing reactions that cleave DNA pref-

cated techniques for identifying particular genes and sequencing their internal structures. This new technology of "gene-sequencing" precipitated the massive scientific research effort of the Human Genome Initiative. When this project is completed shortly after the turn of the century, scientists will possess a complete map of all genes in the human genome.<sup>12</sup> The human genome consists of a set of twenty-three chromosomes found in every nucleated cell of the human body. These chromosomes are composed of DNA molecules that collectively bear the estimated 100,000 genes that define membership in the human species.<sup>13</sup> These genes determine all inborn physical traits of human beings. For example, a person's height, eye color, sex, race, and susceptibility to certain diseases are all determined by the particular genetic structure exhibited in his chromosomes. The complete chromosome set in the human genome is thus the genetic template for humankind.

The rapid progress of current and expected research into the human genome raises new and disturbing ethical and legal issues that have yet to be fully confronted by judicial or political means. A main aspiration of the Human Genome Initiative is to permit the eventual identification and eradication of genetically based human diseases. More than 5,000 medical conditions have been traced directly to defective genes.<sup>14</sup> Thus, the knowledge produced by the Human Genome Initiative promises unprecedented advances in health care and the treatment and prevention of disease. At the same time, the knowledge gleaned from decoding the secrets of the human genome could pose a significant threat to basic human liberties if used for improper purposes. One threatened abuse is the use of genetic information by states or private individuals to promote a Nazi-style program of positive eugenics — the breeding of a new

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entially, allowing the DNA sequence to be analyzed using radioactive bands); F. Sanger & A.R. Coulson, *A Rapid Method of Determining Sequences in DNA by Primed Synthesis with DNA Polymerase*, 94 J. MOL. BIOLOGY 441 (1975).

12. See sources cited, *supra* note 5.

13. For the reasoning behind this estimate, see Gilbert, *supra* note 6, at 83.

14. Genetically based diseases and conditions include phenylketonuria, Gaucher's disease, cystic fibrosis, Huntington's chorea, Tay-Sach's disease, and sickle-cell anemia. See C. Thomas Caskey, *DNA-Based Medicine: Prevention and Therapy*, in CODE OF CODES 112, 116-20 (Daniel J. Kevles & Leroy Hood eds., 1992) (listing several other genetically based diseases and conditions).

master race.<sup>15</sup> A second kind of threat arises from the possibility that genetic information about individuals may become widely assembled and deposited in centralized computer databases, much as credit, tax, and insurance information is today.<sup>16</sup> If access to accumulated genetic information is not subject to proper restrictions, it may cause social stigmas to be placed upon individuals who have, or are perceived to have, certain defects or deficiencies in their genetic makeup. A related concern is that information about alleged defects in an individual's genetic blueprint could be used to discriminate against that individual in employment or insurance contexts.<sup>17</sup> Thus insurance companies might unfairly inflate premiums or limit coverage for individuals known to have a genetic predisposition towards Huntington's Disease, or who have increased susceptibility to cancer. Similarly, an employer might fire, or refuse to hire, an individual on the basis of genetic information which allegedly indicates a predisposition to job-related disabilities, or low productivity.

These concerns about the potential abuses of genetic knowledge present a host of complex ethical and legal issues that must be resolved by the courts and political policy-makers in the future. In particular, the courts will be called upon to

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15. For discussion, see Diane B. Paul, *Is Human Genetics Disguised Eugenics?*, in GENES AND HUMAN SELF-KNOWLEDGE 67 (Robert F. Weir et. al. eds., 1994) (discussing how fear of eugenics has been aroused by information gained through the Human Genome Project); Cf. GEORGE P. SMITH II, GENETICS, ETHICS AND THE LAW 104-06 (1981) (discussing fertilization technologies and constitutional objections to positive eugenics legislation); PHILIP REILLY, GENETICS, LAW AND SOCIAL POLICY 120 (1977) (discussing the use of genetic screening and biochemical markers).

16. See, e.g., Annas, *supra* note 8 (discussing the problems of DNA databanks); Catherine M. Valerio Barrad, *Genetic Information and Property Theory*, 87 NW. U. L. REV. 1037, 1047 (1993) (stating that genetic profile reports could become as available as credit information). See generally Dan L. Burk, *DNA Identification Testing: Assessing the Threat to Privacy*, 24 U. TOL. L. REV. 87 (1992) (discussing the possibility that personal information obtained via genetic testing could be discovered and used for wrongful purposes).

17. See Richard A. Epstein, *The Legal Regulation of Genetic Discrimination: Old Responses to New Technology*, 74 B.U. L. REV. 1, 2-3 (1994) (discussing the possibility that genetic information could be used against those people with "undesirable conditions"); George P. Smith II & Thaddeus J. Burns, *Genetic Determinism or Genetic Discrimination?*, 11 J. CONTEMP. HEALTH L. & POL'Y 23 (1994) (analyzing technology and biological determinism along with constitutional and legislative protections); Frances H. Miller & Philip A. Huvos, *Genetic Blueprints, Employer Cost-Cutting, and the Americans with Disabilities Act*, 46 ADMIN. L. REV. 369 (1994) (analyzing genetics issues under the ADA); Henry T. Greely, *Health Insurance, Employment Discrimination, and the Genetics Revolution*, in CODE OF CODES 264, 266 (discussing the difficulties of obtaining health insurance for individuals at high risk for genetic illnesses).

determine the nature of an individual's legally protected privacy interests in his own genetic information. There are four traditional strands to an individual's right to privacy. These concern (i) intrusion upon the plaintiff's seclusion or solitude, (ii) public disclosure of embarrassing private facts about the plaintiff, (iii) publicity that places the plaintiff in a false light in the public eye, and (iv) appropriation, for defendant's advantage, of plaintiff's name or likeness.<sup>18</sup> The acquisition or use of DNA information in a given context could conceivably implicate all of these strands of the right to privacy. There is little doubt that the courts will establish a legal privilege that could be labeled an individual's "right to genetic privacy." The right to genetic privacy will determine the extent to which an individual may prevent others — for example, health care providers, employers, or law enforcement officials — from acquiring information about his genetic makeup. It will also determine the extent to which the individual can block or limit access to his genetic information, once lawfully assembled, by third parties.<sup>19</sup>

In the next section, I will briefly review the jurisprudential history behind the legal right to privacy. Then I shall return once more to considering the relation between privacy interests and genetic information.

### B. The Right To Privacy

In American jurisprudence, the notion that an individual has a legally protected privacy interest in his own identity was first suggested in an 1890 law review article by Samuel Warren and Louis Brandeis.<sup>20</sup> The authors observed that the modern news enterprise posed novel threats to the traditional common law right of an individual to determine the extent to which his personal thoughts and sentiments, whatever the man-

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18. See William L. Prosser, *Privacy*, 48 CAL. L. REV. 383, 389 (1960) (describing four classic types of personal invasion).

19. For treatment of the right to genetic privacy in medical contexts, see Annas, *supra* note 9. For a discussion of privacy issues in health and employment contexts, see Greely, *supra* note 17, at 266-67. For the use of genetic information in law enforcement contexts, see Burk, *supra* note 16.

20. Samuel Warren & Louis Brandeis, *The Right to Privacy*, 4 HARV. L. REV. 193 (1890).



ner of their expression, shall be communicated to others.<sup>21</sup> The development of mechanized printing presses and other devices of modern mass media threatened “to make good the prediction that ‘what is whispered in the closet will be proclaimed from the housetops.’”<sup>22</sup> In response, Warren and Brandeis postulated a common law “right to privacy” founded upon the principle of “inviolate personality.”<sup>23</sup> This right to privacy establishes a protective zone around certain privileged thoughts, feelings, and actions of an individual from unwanted publication or expropriation.<sup>24</sup>

Warren and Brandeis also acknowledged that the right to privacy that protects manifestations of an individual’s personality from unwanted intrusions may coincide with a property right. Warren and Brandeis asserted that the right to privacy is potentially independent of, and broader in scope than, property interests (at least as the latter are ordinarily conceived). For example, the right to privacy can prevent a newspaper from publishing details of an individual’s vacation itinerary without his consent, despite the fact that the individual has no legally protected property interest in such information. Privacy interests bear at least a formal resemblance to property interests. A privacy interest in something implies a right to exclude others from making use of that thing, and the right to exclude is in turn one of the characteristic legal incidents of property. However, Warren and Brandeis claimed that “the principle which protects personal writings and all other personal productions, not against theft and physical appropriation, but against publication in any form, is in reality not the principle of private property, but that of an inviolate personality.”<sup>25</sup> Hence, a person may retain both a property interest in artifacts of his personality and a (privacy-based) legal privilege to exclusive use and control over these artifacts that is broader in scope than the former.

The Supreme Court subsequently recognized a constitu-

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21. *Id.*

22. *Id.* at 195.

23. *Id.* at 205.

24. *Id.*

25. *Id.*

tional basis for this common law right to privacy as an aspect of the right to liberty guaranteed by the Due Process Clause of the Fifth and Fourteenth Amendments. Most famously, the Supreme Court established a constitutional right to privacy in matters concerning intimate individual decisions pertaining to birth control and abortion.<sup>26</sup> The Court has explicitly declined to extend legal protection under the right to privacy to consensual sodomy,<sup>27</sup> a taxpayer's interest in preventing disclosure of his tax records,<sup>28</sup> and a depositor's interest in preventing dissemination of his bank records.<sup>29</sup> In the next section, I shall review the nature of arguments presented by legal scholars for treating genetic information with heightened scrutiny under the right to privacy.

### C. Personal Privacy and Genetic Information

Genetic information about an individual deserves at least as much protection under the right to privacy as ordinary medical information. An individual's DNA blueprint contains a vast amount of information, much of it currently undecipherable, about the person's biologically determined characteristics. Today scientists can analyze DNA blueprints to detect genetic markers that indicate an individual's susceptibility to an increasing number of hereditary diseases, including Down's Syndrome, phenylketonuria, hemophilia, and cystic fibrosis.<sup>30</sup> As our genetic knowledge increases, DNA blueprints will prove to have increasingly significant medical implications for the diagnosis and treatment of diseases.

George Annas has suggested, however, that a DNA blue-

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26. See *Roe v. Wade*, 410 U.S. 113, 153 (1973) (stating that the right to personal privacy "is broad enough to encompass a woman's decision whether or not to terminate her pregnancy"); *Griswold v. Connecticut*, 381 U.S. 479, 499 (1965) (holding that a Connecticut law forbidding the use of contraceptives unconstitutionally intrudes upon the right of marital privacy).

27. See *Bowers v. Hardwick*, 478 U.S. 186 (1986) (finding constitutional a Georgia statute criminalizing sodomy).

28. *Fisher v. United States*, 425 U.S. 391 (1976) (holding that taxpayers' accounting documents in their attorneys' possession were not constitutionally immune from summons directing their production).

29. See *United States v. Miller*, 425 U.S. 435 (1976) (holding that a bank depositor had no Fourth Amendment interest in bank records).

30. See Caskey, *supra* note 14, at 116-17 (stating that technological improvements in newborn screening procedures have enabled doctors to detect genetic mutations by simple DNA-based methods).

print is potentially more sensitive than ordinary medical information about an individual.<sup>31</sup> Annas analogizes a DNA blueprint to a probabilistic "future diary" of an individual's projected life history.<sup>32</sup> As genetic science advances, the DNA blueprint may well be used to make increasingly accurate statistical predictions about the odds that a given event will befall a person at some point in his future. Scientists may well develop the capacity to scan an individual's DNA blueprint and predict the odds that the individual will, for example, commit arson, develop a gambling problem, or become a world-class mathematician. Hence, one might argue that the probabilistic "future diary" contained in a DNA blueprint is at least as intimate a manifestation of an individual's inviolate personality as his written diary.

At the same time, the case for giving DNA information heightened protection under the right to privacy is not necessarily limited to its conjectured predictive power concerning an individual's future life history. State and federal circuit courts have extended the privacy right to encompass a variety of infringements against the particular manifestations of a person's identity besides the paradigm cases of unwarranted intrusions into his diary, personal records, or private behavior. Such infringements include expropriation of a person's name,<sup>33</sup> photograph, or likeness,<sup>34</sup> his signature;<sup>35</sup> and his

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31. Annas, *supra* note 8, at 2347-48.

32. *Id.*

33. See *Vanderbilt v. Mitchell*, 67 A. 97 (N.J. 1907) (stating that "[i]t sufficiently appears that the complainant's property rights now existing . . . are seriously menaced by the unlawful and unwarranted use of the complainant's name as the father of the child in the recorded birth certificate"); *Brown Chem. Co. v. Meyer*, 139 U.S. 540, 542-44 (1891) (finding that a drug manufacturer had the right to use its name even though other manufacturer also used that name because the name was used in good faith and there was no evidence of fraud or intent to deceive the public).

34. See *Motschenbacher v. R.J. Reynolds Tobacco Co.*, 498 F.2d 821, 825 (9th Cir. 1974) (holding that California courts would afford legal protection to an individual's proprietary interest in his own identity); *Lugosi v. Universal Pictures*, 603 P.2d 425, 428 (Cal. 1979) (en banc) (holding that the right to exploit "name and likeness" is personal and must be exercised during the artist's lifetime); *Munden v. Harris*, 134 S.W. 1076, 1079 (Mo. Ct. App. 1911) (concluding that one has exclusive property right in his picture, and unless he has expressly or implicitly consented to its use by others, he may sue for invasion of that right); *Canessa v. J.I. Kislak, Inc.*, 235 A.2d 62, 76 (N.J. Super. 1967) (holding that a company which used plaintiff's likeness for its own commercial benefit violated plaintiff's "property" rights).

35. See *United States Life Ins. Co. v. Hamilton*, 238 S.W.2d 289, 292 (Tex. Civ. App. 1951) (stating that the "use of an individual's signature for business purposes unquestionably

voice or even a likeness of his voice.<sup>36</sup> Hence it may appear that information about an individual's DNA blueprint deserves special protection under the right to privacy, notwithstanding its conjectured predictive strength. For example, as Catherine Valerio Barrad states:

[An] individual's genetic profile is even more innately an attribute of his identity than is his likeness or his voice, since the latter are merely physical expressions of genetic information. If one's face, physical features, and voice are so intrinsic to the individual as to be protected as inviolate personality, then the genetic determinate of those attributes must be the true expression of the person's identity and also protected against appropriation.<sup>37</sup>

The idea that genetic information constitutes the sacred ground of personal identity is not, of course, merely the effect of creative extrapolation by legal scholars from state and federal case law. As we saw in the Introduction, this idea is promoted independently by dramatic pronouncements from such pillars of the scientific community as Watson, Crick, and Gilbert. (Recall here Gilbert's declaration that understanding genetic structure is "the ultimate answer to the commandment 'Know thyself'").<sup>38</sup> The putative sanctity of genetic information is also promulgated in American culture at large by a host of news articles, television shows, movies, and works of popular and literary fiction.<sup>39</sup> As far as popular American culture is concerned, DNA blueprints are widely conceived as "the 'ultimate identifier,' an utterly conclusive code establishing the essence as well as the identity of the person."<sup>40</sup>

However, the mere fact that DNA appears to be acquiring a cultural significance similar to that of the Biblical soul does

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constitutes the exercise of a valuable right of property in the broadest sense of that term").

36. *Midler v. Ford Motor Co.*, 849 F.2d 460, 463 (9th Cir. 1988) (stating that a person's voice, or an impersonation of his or her voice, is the individual's property, and to use an impersonation without authorization is a tort under California law), *aff'd sub nom.* *Midler v. Young & Rubicam, Inc.*, Nos. 90-55027 & 90-55028, 944 F.2d 909, 1991 WL 185170 (9th Cir. 1991) (affirming prior ruling that advertising agency inappropriately sought to imitate professional singer's voice, which was an attribute of the singer's identity), *cert. denied*, 503 U.S. 951 (1992).

37. Barrad, *supra* note 16, at 1070.

38. BISHOP & WALDHOLZ, *supra* note 4.

39. For an extensive review of this material, see NELKIN & LINDEE, *supra* note 7.

40. *Id.* at 47.

not of itself justify such a prospective dignification. Let us assume, *arguendo*, that if an individual's DNA blueprint encodes the essence of his personal identity, then it does deserve special legal protection under the right to privacy. What remains to be seen is whether we have good grounds for accepting the antecedent of this conditional: Does DNA structure really encode the essence of a person's identity? To evaluate this claim, we must first conduct an independent investigation into our concept of personhood. Such will be the task of Part II of this Article. In Part III, I shall use the results of this investigation to show why DNA should not be conflated with the essence of an individual's personal identity.

### III. THE CONCEPT OF A PERSON

#### A. Theories of Personal Identity

The idea of personal identity has long exercised the imaginations of philosophers and psychologists. The American legal system, however, has never established any precise definition of this concept.<sup>41</sup> The Fourteenth Amendment extends legal protection to all *persons* born or naturalized within the United States. But the Constitution does not contain any definition of this term. The Supreme Court does make reference to the definition of "person" in three cases. But two of these three cases merely establish the proposition that children are persons within the meaning of the Constitution.<sup>42</sup> The third case states, in

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41. On the absence of any substantive theory of personal identity in constitutional law, see Michael D. Rivard, *Toward a General Theory of Constitutional Personhood: A Theory of Constitutional Personhood for Transgenic Humanoid Species*, 39 UCLA L. REV. 1425, 1445-66 (1992), which attempts to formulate a new concept of personhood for American jurisprudence. Constitutional law does define a distinction between "natural" persons and "artificial" persons, where the former category applies to humans and the latter to legally created business entities such as corporations. See, e.g., *Rowland v. California Men's Colony*, 506 U.S. 194, 199-205 (recognizing that, while "the wor[d] 'person' includes corporations, . . ." There remains a distinction between "artificial persons" and "natural persons"). Even though the law has given a more or less precise definition of "artificial" persons, it has effectively treated the concept of a natural person as an undefined primitive.

42. *In re Gault*, 387 U.S. 1 (1967) (holding a juvenile has the right to notice of charges, to counsel, to confrontation, to cross-examination of witnesses, and to the privilege against self-incrimination); *Levy v. Louisiana*, 391 U.S. 68 (1968) (stating that illegitimate children are "clearly persons" under the Fourteenth Amendment, and holding that denying them the right to recover for the wrongful death of their mothers would be "invidious discrimination").

apparent *dicta*, that a fetus is not a person for constitutional purposes.<sup>43</sup> Of course, the current lack of any well-developed judicial theory of personhood is not surprising. In practice, the law can, for the most part, operate quite effectively without any precise definition of "person." Most litigated issues involve adult human beings, creatures to whom the application of the term is uncontroversial. However, to gain a proper understanding of the relation between genetic information and personal identity, we must directly confront the question of what it is that makes persons the kinds of things they are.<sup>44</sup>

Theories of personal identity have been propounded since the dawn of philosophy.<sup>45</sup> For our purposes, we can usefully categorize the distinctive features of these theories by reference to the views of Aristotle, Descartes, and David Hume. A broadly Aristotelian view of personal identity derives its inspiration from Aristotle's ancient definition of man as a *rational animal*.<sup>46</sup> Accordingly, the concept of a person is the concept of a single biological entity, a living material organism, which has a distinctive functional or behavioral capacity.<sup>47</sup> This distinctive capacity is the ability to reason: to have thoughts, draw logical inferences, enjoy self-reflective awareness, and deliberate rationally about what to do.<sup>48</sup> By comparison, a Cartesian

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43. See *Roe v. Wade*, 410 U.S. 113, 158 (1973) (stating that "the word 'person,' as used in the Fourteenth Amendment, does not include the unborn").

44. Many scholars have written on legal issues involving the topic of personal identity. See, e.g., Rochelle Cooper Dreyfuss & Dorothy Nelkin, *The Jurisprudence of Genetics*, 45 VAND. L. REV. 313, 316 (1992) (stating that genetic essentialism will force lawmakers to reconsider legal rules that currently mediate relationships between persons and their community); Rivard, *supra* note 41 (examining the question of what should constitute personhood in American jurisprudence); Stephen C. Hicks, *On the Citizen and the Legal Person: Toward the Common Ground of Jurisprudence, Social Theory, and Comparative Law as the Premise of A Future Community, and the Role of the Self Therein*, 50 U. CIN. L. REV. 789 (1991) (discussing the role and conception of "person" in modern legal theory); Amy Johnson, *Abortion, Personhood, and Privacy in Texas*, 68 TEX. L. REV. 1521, 1530-31 (1990) (stating that Texas common law does not recognize a fetus as a person); Margaret Jane Radin, *Property and Personhood*, 34 STAN. L. REV. 957 (1982) (discussing the relationship between personhood and control over resources in one's external environment).

45. For a useful sampling of theories offered by both ancient and modern philosophers, see PERSONAL IDENTITY (John Pery ed., 1975) (compiling essays by fifteen philosophers on topics related to personal identity, personality, and self).

46. ARISTOTLE, *DE ANIMA*, 412b10-25, 414b1-9 (R.D. Hicks trans., 1907). For an analysis of Aristotle's view of the person, see T.H. Irwin, *The Metaphysical and Psychological Basis of Aristotle's Ethics*, in *ESSAYS ON ARISTOTLE'S ETHICS* (Amelie Oksenberg Rorty ed., 1980).

47. For further discussion on the concept of a person, see DAVID WIGGINS, *SAMENESS AND SUBSTANCE* 149-89 (1980).

48. For an elucidation of this rationality criterion, see Donald Davidson, *Rational Animals*,

view of the self draws inspiration from Descartes' famous pronouncement: *cogito, ergo sum* ("I think, therefore I am").<sup>49</sup>

The Cartesian view pins the essence of personal identity on the capacity to reason alone. It conceives the person as an immaterial thinking substance, or soul. Persons are purely mental entities that can exist independently of their material bodies.<sup>50</sup> The Humean view, in turn, goes one step further by simply dispensing with the idea that the self is any distinctive kind of entity at all. This most radical view is inspired by David Hume's notorious complaint that nothing in his own felt experience actually corresponds to the perception of a unitary thinking subject over time.<sup>51</sup> As such, the Humean view denies that the pronoun "I" refers to any kind of entity, be it a material body or an immaterial thinking soul, whatsoever. On this "no-self" view of the self, the term 'I' denotes a fictitious entity which reduces upon analysis to nothing but a series of temporally related sensations, thoughts, and emotions.<sup>52</sup> However, we need not embark upon any detailed evaluation of

in ACTIONS AND EVENTS: PERSPECTIVES ON THE PHILOSOPHY OF DONALD DAVIDSON 473-80 (Ernest Lepore & Brian McLaughlin eds., 1985) (arguing that the attribution of reasoning ability presupposes a capacity for linguistic communication).

49. For the classic statement of Descartes' theory of the self as a thinking substance, see *Meditations on First Philosophy*, in THE PHILOSOPHICAL WORKS OF DESCARTES 131, 151-53 (Elizabeth S. Haldane & G.R.T. Ross trans., Cambridge University Press 1967). For modern discussion and critique of the Cartesian view of self, see generally PAUL M. CHURCHLAND, MATTER AND CONSCIOUSNESS: A CONTEMPORARY INTRODUCTION TO THE PHILOSOPHY OF MIND 7-21 (1984) (discussing the various dualist approaches to the mind); MARGARET DAULER WILSON, DESCARTES (1978); BERNARD WILLIAMS, DESCARTES: THE PROJECT OF PURE ENQUIRY (1978).

50. *Id.* Prominent proponents of a Cartesian-esque concept of person in the history of philosophy include John Lock and Immanuel Kant. Outside theological circles, the Cartesian view of the self has few, if any, defenders in modern times. See also Richard Warner, *In Defense of Dualism*, in THE MIND-BODY PROBLEM: A GUIDE TO THE CURRENT DEBATE 343 (Richard Warner & Tadeusz Szubka eds., 1994) (defending the traditional doctrine of "incorrigibility" recognizes a fundamental epistemological difference between the mental and the physical).

51. Hume states:

For my part, when I enter most intimately into what I call *myself*, I always stumble upon some particular perception or other, of heat or cold, light or shade, love or hatred, pain or pleasure. I never catch *myself* at any time without a perception, and never can observe anything but the perception. When my perceptions are removed for any time, as by sound sleep, so long as I am insensible of *myself*, and may truly be said not to exist.

PERSONAL IDENTITY, 162 (John Perry ed. 1975) (quoting DAVID HUME, TREATISE OF HUMAN NATURE, Book I, Part. IV, § 2 (1739)).

52. A modern example of the "no-self" Humean view is presented in DEREK PARFIT, REASONS AND PERSONS, Part III (1984).

these competing theories of self as presented by their ablest philosophical defenders. Law in its practical respects is a justly conservative intellectual enterprise. Hence we may properly dismiss those approaches to personal identity that least accord with our common sense and scientific pictures of the world.

The Cartesian theory of a person as a non-material thinking substance has traditionally foundered over two related objections. First, it postulates a mysterious non-physical substance that scientists have yet to quantify, or even feel any need to invoke, in their best theories for explaining and predicting the course of our worldly experience. Second, the very idea of a non-physical thinking substance appears to preclude any intelligible possibility of causal interactions between mind and the physical world. Our concept of a causal relation is preeminently that of a relation that holds between physically definable entities or magnitudes. In short, we think that only a physical entity can causally affect another physical entity, and that a physical entity can be causally affected only by another physical entity. By contrast, the Cartesian view of the person introduces a seemingly insoluble mystery as to how there can be "two-way" causal transactions between the non-physical minds and physical objects. How can a non-physical thinking entity cause events in the physical world like the movement of an arm or a leg? How can physical events, e.g. retinal irradiation or the impact of hammer on thumb, produce thoughts and feelings in a non-physical thinking substance? Given the gravity of these difficulties, we may properly reject the Cartesian conception of personhood as incompatible with our scientific conception of the physical world.<sup>53</sup>

Similarly, the Humean "no-self" theory can be dismissed as a candidate for articulating a legally serviceable concept of personal identity on both scientific and common sense grounds.<sup>54</sup> First, the Humean theory faces an analogous prob-

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53. Extended historical and philosophical critiques of the Cartesian view of self may be found in ANTHONY KENNY, *THE METAPHYSICS OF MIND* 1-31 (1989); RICHARD RORTY, *PHILOSOPHY AND THE MIRROR OF HUMAN NATURE*, 17-61 (1979).

54. For a philosophical critique of the Humean view of self, see, e.g., BERNARD WILLIAMS, *MORAL LUCK: PHILOSOPHICAL PAPERS 1973-1980* 1-19 (1981) [hereinafter *MORAL LUCK*] (comparing Kantian and Unitarian components of self); see also WIGGINS, *supra* note 47, at 169-76 (distinguishing between the concept of "persons" expressed by John Locke and Descartes, and



lem about accounting for two-way causal transactions between the mind and the physical world. For Hume, there is no unitary thinking self that enters into causal transactions with the world, there is only a temporally connected “stream” of sense-impressions.<sup>55</sup> Thus, while the Cartesian view has grave difficulty accounting for the possibility of causal interactions between mind and physical objects, the Humean view runs into equally serious trouble in its denial that such interactions take place at all. Second, from a common sense perspective, the Humean “no-self” theory moots the whole question of legally protected aspects of personhood. If there really are not such things as persons in reality (qua unitary subjects of sense-expressions), then there are no legally protected incidents of personal identity.

By comparison, the Aristotelian conception of personhood is not beset by any of the difficulties described above, and best fits our common sense and scientific world views.<sup>56</sup> Persons are physical (biological) entities with distinctively rational capacities, or modes of functioning. They are material bodies that can *do* certain distinctive things, in contrast with other material bodies like rocks and chairs that cannot. Of course there are lingering puzzles about how physical entities can have thoughts, feelings, and so on. But the Aristotelian assumption that persons are physical entities avoids the otherwise insoluble Cartesian problem about the nature of causal interaction between mind and world. It also supplies us with an entity that has practically meaningful criteria of identity upon which a substantive theory of legal personality can be built.

the concept held by Hume, among others).

55. As a matter of fact, Hume’s notorious skeptical theory of causal relations also led him to deny the existence of any external world of unitary physical objects — let alone a world containing unitary thinking selves. See generally J.L. MACKIE, *THE CEMENT OF THE UNIVERSE: A STUDY OF CAUSATION* (1974). In the final analysis, the Humean world consists *solely* of a temporally connected stream of sense-impressions. But Hume’s distinctive view of the self can, of course, be detached from and considered independently of his skepticism regarding the existence of physical objects.

56. Prominent contemporary philosophers who have argued for a broadly Aristotelian view of the self include ANTHONY KENNY, *supra* note 53; WIGGINS, *supra* note 47, at 149-89 (discussing the author’s concepts of personal identity). For comprehensive, technical presentations of modern philosophical and scientific accounts of the relationship between self, mind, and body, see COLIN MCGINN, *THE PROBLEM OF CONSCIOUSNESS, ESSAYS TOWARD A RESOLUTION* (1991); JOHN SEARLE, *THE REDISCOVERY OF MIND* (1994).

## B. Two Basic Components of Personhood

If we start with a broadly Aristotelian concept of the person, how then are we to understand the connection between its biological and functional components? First, we might restrict the biological component of personhood to the human species, as Aristotle evidently did. But intuitively, there seems no sound reason for such “species chauvinism.” Other kinds of living creatures — for example, dolphins and chimpanzees — might conceivably evolve the capacity to satisfy the functional component of personhood. If dolphins developed a proven capacity to reason like normal human beings, it is hard to see why we should withhold application of the term “person” to them. Dolphins already enjoy limited protection from tuna fisherman under the law. If dolphins were to demonstrate a capacity to conform their behavior to moral and legal strictures — e.g., to make and keep promises with human beings in the scope of social and economic endeavors — there seems no intuitive objection to extending them full-scale legal protection as persons under the Fourteenth Amendment. Similarly, if alien life forms from another solar system were to land on earth and likewise demonstrate a capacity to communicate, reason, and behave morally, at least as well as normal human beings, we should have little scruple against regarding them as persons. Consequently, it seems best not to restrict the biological component of personhood to the human species alone. Human beings are of course the only kind of creature of which we are aware that deserves to be counted as persons. But in theory, any kind of living organism which can satisfy the functional component of personhood should be also considered a person.<sup>57</sup>

Next, let us focus on the functional component. Should something be considered a person if it has the capacity to reason just like normal human beings, but is *not* a creature belonging to any biological kind? Since the dawn of the computer age, scientists, science fiction writers, and laymen have

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57. For a philosophical discussion of the “species-independent” nature of personhood, see WIGGINS, *supra* note 47, at 169-76 (discussing the nature and limits of personhood with respect to humans, plants, and animals).

fantasized about the possibility of a computer that could be programmed to think and reason at least as well as normal humans do, and perhaps even better. We already have computers that can be programmed to “reason” both faster and just as accurately as human beings can in regard to certain restricted types of problems, such as doing arithmetical sums or working out chess problems. Indeed, the IBM chess machine, “Deep Blue,” made recent headlines by becoming the first computer to defeat the reigning world champion Garry Kasparov in a game played under tournament conditions.<sup>58</sup> Moreover, in the next twenty to fifty years, we will most probably be able to program computers that can effectively simulate *all* the verbal reasoning behavior of, say, an average thinking human being with a college education. When this day comes, an individual could go on-line in an Internet “chat-room” containing five human beings and a computer, and be completely unable to distinguish which “person” is the computer, judging solely by the electronically transmitted conversation. A computer that has the ability to simulate normal human conversational behavior without detection is said to pass the celebrated “Turing Test” for an artificially intelligent system.<sup>59</sup> Should we extend the concept of person to include computers or any form of man-made machine that can pass the Turing Test? Such devices would, by definition, satisfy the functional reasoning component of personhood. But they would not, of course, belong to any kind of biological category.

Let us set aside any awkward issues that might arise if,

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58. Deep Blue shocked the chess community by winning the opening match in the 1996 ACM Chess Challenge tournament with Kasparov. But Kasparov later rebounded to defeat the computer soundly by the final game score of the competition. See Jack Peters, *Deep Blue is Deep-Sixed by Kasparov*, L. A. TIMES, Feb. 18, 1996, at A21 (“In the first game of the match, Deep Blue became the only program to defeat a world champion under standard tournament conditions”). For a discussion of the implications of this event for the development of artificial intelligence, see Robert Wright, *Can Machines Think?*, TIME, Mar. 25, 1996, at 50 (explaining recent advances in artificial intelligence, future possibilities, and pertinent philosophical questions).

59. A.M. Turing, *Computing Machinery and Intelligence*, 59 MIND 433 (1950) (proposing the creation of an “imitation game” in which one of the participants is a computer which has the capability of learning, thinking, and imitating human conversational behavior; others are human, and an “interrogator” determines which participant is the computer based on the unidentified answers to his or her questions to the participants). For an accessible elucidation of the “Turing Test” for artificial intelligence, see ROGER PENROSE, *THE EMPEROR’S NEW MIND* 6-13 (1989).

fifteen years from now, we were legally obliged to grant two week's vacation time to, for instance, the massively parallel 900 gigahertz "Wintel" computers on our desktops. Computers are made of silicon chips, not flesh, blood, and DNA. Being made of such different kinds of stuff, we think intuitively that computers could not have the conscious thoughts, feelings, and emotions that living human beings do.<sup>60</sup> This is true despite the fact that computers can certainly be programmed to "talk" as if they do have such thoughts and feelings. The application of our concept of a person is intuitively restricted to living organisms that satisfy the functional component of reasoning ability. No entity can count as a person merely because its behavior can simulate that of a normal reasoning human being. It must also be a living creature that belongs to some biological category or other. Of course, this does not preclude the possibility that future scientists may manufacture some form of *organic* reasoning device that satisfies the two conditions for personhood. But by definition, an organic reasoning device would be an instance of artificially manufactured *life*, not simply non-living artificial intelligences like our everyday Pentiums and Macs.

### C. The Fundamental Criterion of Personal Identity

So far, we have analyzed the general concept of a person, but we have yet to tackle the nature of personal or self-identity. What is it that makes one person the same or different from another? A quick answer is that persons A and B are the same if they have exactly the same set of properties, and conversely, that A and B are different persons if there is at least some property true of one but not the other. This answer is entirely correct. But it is uninformative insofar as it follows purely from the formal logic of identity known as Leibniz's Law.<sup>61</sup> For our purposes, we seek bigger game. Given that a person is an organism of some biological kind with a distinc-

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60. For an elaboration of this intuition, see JOHN SEARLE, *THE REDISCOVERY OF THE MIND* 65-82 (1992) (discussing the idea that the relationship between consciousness, behavior, and the brain supports the notion that the world is not completely objective).

61. For a discussion of Leibniz's Law and its logical and philosophical implications for the concept of identity, see WIGGINS, *supra* note 47, at 15-46.

tive threshold capacity to reason, we may infer that identity and difference of persons is parasitic on identity and difference of organisms within biological kinds.<sup>62</sup> But what makes one organism of a given biological kind the same or different from another? Here the concept of a DNA blueprint has an obvious role to play. If two organisms of the same species have different DNA blueprints, then it follows from the logic of identity that the difference in genetic properties entails that these organisms must be different persons (if indeed they are persons). But what if organisms A and B have the same DNA blueprints? Can we infer that A and B are one and the same organism, hence the same person?

Here the answer must be an emphatic no. Two or more organisms can share the same DNA blueprint without being identical. The biological property of having a certain DNA structure is typically unique to each member of any complex species of animal. These biological properties may, nonetheless, be shared by other members of that species. Identical human twins can share the same DNA blueprint. But, of course, they count as two different persons. In addition, two or more different pairs of parents could, in theory, produce children that, courtesy of some truly amazing rolls of the genetic dice, end up sharing the same DNA blueprint. Regardless of how astronomically unlikely such an event would be, these combination principles of genetic science render it a theoretical possibility.

Moreover, genetic scientists have long been capable of engineering or "cloning" from a DNA blueprint genetically identical copies of simple organisms like bacteria, not to mention individual human cells (including embryo cells).<sup>63</sup> And as startling newspaper accounts in 1997 have recounted, Scottish scientists Keith Campbell and Ian Wilmut recently succeeded in cloning a genetically identical sheep from the DNA

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62. Of course, given the possibility that more than one biological kind (e.g., humans and dolphins) could possess the appropriate reasoning capacity, identity, and difference of persons may also supervene upon identity and difference of organisms both within and across biological kinds.

63. See Kathy Sawyer, *Researchers Clone Human Embryo Cells*, WASH. POST., Oct. 25, 1993, at A4 (discussing how George Washington University researchers cloned cells from abnormal human embryos which survived up to the equivalent of six days of maturation).

blueprint of another animal.<sup>64</sup> This new cloning breakthrough gives today's genetic scientists the basic technological expertise to clone higher mammals — including human beings — from a single DNA blueprint.<sup>65</sup> Apparently, genetic scientists actually possess, or will very soon possess, the capacity to create a genetic duplicate of every person on the face of the earth. Consequently, while a difference in DNA blueprints entails difference of persons, sameness of the DNA blueprint cannot logically guarantee sameness of person. DNA structure is, therefore, not to be confused with the Holy Grail of personal identity. DNA structure is at best a necessary but not a sufficient condition for personal identity. Two further questions arise. First, if DNA does not determine *sameness* of personal identity, what else does? Second, how should we understand the relation between DNA and personal identity? I shall consider each in turn.

At this point, the condition which determines sameness of person may begin to look rather mysterious. Indeed, it will exude this air of mystery so long as we seek some immutable factor that determines the essence of each individual person's identity. The key to the nature of personal identity is to be found in rather more humble contingent facts that make up each person's unique life history. Each human being travels upon a logically contingent but empirically unique path through

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64. See Rick Weiss, *Scottish Scientists Clone Adult Sheep: Technique's Use With Humans Is Feared*, WASH. POST, Feb. 24, 1997, at A1 (reporting that Scottish scientists Ian Wilmut and Keith Campbell successfully cloned an adult sheep, and discussing the ethical considerations of applying the technology to humans); Ronald Kotulak, *First Mammal is Cloned: Breakthrough Could Make it Possible to Duplicate Humans*, CHI. TRIB., Feb. 23, 1997, at 1 (outlining the steps used in the cloning technique and discussing the possible agricultural opportunities cloning could create).

65. Kotulak, *supra* note 64 (explaining how scientists reactivated shut off genes through fusion during sheep cloning). This new cloning technology has not yet been used successfully to create genetically identical human beings. Moreover, there remain significant questions about whether it would be morally and or socially desirable to do so. But in any event, it is now not seriously disputable that genetic science permits the technical possibility of cloning of a series of genetically identical human beings from the DNA blueprint found in any single nucleated human cell. Politicians, lawyers, and laymen have yet to confront fully the moral and social implications of this technological possibility. See, e.g., Philip Elmer-Dewitt, *Cloning: Where Do We Draw the Line?*, TIME, Nov. 8, 1993, at 65-70 (discussing situations in which cloning may occur, and the ethical considerations involved); George A. Hudock, *Gene Therapy and Genetic Engineering: Frankenstein is Still a Myth But It Should Be Reread Periodically*, 48 IND. L. J. 533, 548-50 (1973) (noting that regulation has not caught up with current levels of genetic engineering technology and proposing that doing so is "possible and will not be overwhelmingly confusing").

space and time during the course of his life history. So sameness of biological kind and sameness of spatiotemporal position, or route, determines — that is, is both necessary and sufficient for — sameness of personal identity.<sup>66</sup>

Sameness of both biological kind and spatiotemporal position is a sufficient condition for personal identity because only one person can be in exactly the same place at the same time. If we know that the President of the United States is the man speaking from that podium now, and that Hillary Clinton's husband is speaking from the podium now, then we may infer that Hillary's husband and the President of the United States are one and the same person. Similarly, if we have evidence proving that the young man who installed astro-turf in his pickup truck some thirty odd years ago has traveled upon a continuous spatiotemporal route to the position of the man now speaking from the podium, we may correctly deduce that they are one and the same person. Sameness of biological kind and spatiotemporal position is also a necessary condition for personal identity. If we can establish difference of biological kind, or more commonly, difference of spatiotemporal position, we can correctly deduce a difference of person.

Appeal to this feature of personal identity is commonly employed in the context of criminal prosecutions. Thus for example, the accused may be exonerated by an alibi establishing his presence in Los Angeles on the night of the Miami murder. Alternatively, the logic of personal identity may exonerate if DNA evidence shows the crime must have been committed by a woman and the accused is a man. Such familiar and elementary patterns of reasoning show that the Holy Grail of personal identity is, at bedrock, just sameness of biological kind and spatiotemporal position. At any rate, this is the basic criterion of personal identity implicit in our common sense, legal, and scientific world views.<sup>67</sup>

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66. For a comprehensive, if technical, discussion of this principle and the theory behind it, see WIGGINS, *supra* note 47, at 47-74, 149-89 (proposing and discussing a theory of individuation).

67. Of course, science fiction writers have fantasized about the possibility of one person's being in two different places at the same time, or of two or more persons, or "souls," that share the same body. Such imaginings are at odds with the broadly Aristotelian concept of a person implicit in our common sense and scientific theories of the world. We need not take them seriously in any

#### D. Personal Identity and Character

So let us proceed on the premise that sameness of biological kind and spatiotemporal position is the fundamental criterion of personal identity. At the same time, what most interests us about the concept of personal identity are not bare facts about sameness of biological kind and spatiotemporal route. We think that the most important facts that make a human being the person he is are facts about what he *does* — facts about his thoughts, feelings, choices, and actions — as he passes through space and time. The unvarnished facts about the unique spatiotemporal path he traverses may form the metaphysical substrate of his personal identity. From a psychological, social, and moral perspective, however, the facts that are most important in making a human being the very person he is are facts about what he chooses to do with his life. As the existentialist philosopher Jean Paul Sartre articulated this idea, the “existence” of a person precedes his “essence,” and the latter is created by the free choices he faces and makes during the course of his life history.<sup>68</sup> Another way of expressing the same idea is that the identity of a person is determined by the character he develops.<sup>69</sup> Roughly speaking, a person’s character is the set of mental properties and dispositions that distinguishes him as a unique individual from all other persons. Later on, we shall see that this preliminary definition requires considerable qualification and sharpening.<sup>70</sup>

For the present, we may begin with the idea that a person’s character is defined by all the properties of his past and present mental history. It includes all the particular thoughts, feelings, deliberations, and choices that constitute his mental history up to the present. And it also includes whatever properties of a person that make it true to say that he has cer-

attempt to elucidate a legally serviceable concept of personal identity.

68. See Jean Paul Sartre, *Existentialism*, reprinted in *EXISTENTIALISM: FROM DOSTOEVSKY TO SARTRE* 287-94 (Walter Kaufman ed., 1956).

69. For a discussion of the importance of character to our concepts of personal identity and morality, see, e.g., WILLIAMS, *MORAL LUCK*, *supra* note 54 (arguing that the person undergoes changes in character and remains unitary, not a disjointed collection of moral beliefs).

70. In section III.D, I conclude that this provisional definition of character should be restricted to exclude any mental properties or dispositions that lie beyond the causal control of a person’s free will.



tain dispositions to think, feel, deliberate, or choose in certain ways in the future.<sup>71</sup>

What then, is the connection between a person's character and the fundamental criterion of personal identity? Here it is important to understand that, properly interpreted, the idea that character determines personal identity does not conflict with the principle that sameness of person is determined by sameness of biological kind and spatiotemporal route. Of course, two different persons can develop remarkably similar characters. But according to the provisional definition of "character" above, no two individuals can have exactly the same character. It is very unlikely, but not necessarily impossible, for two different persons to share the same dispositional properties of character. Two or more people could share their set of characteristic propensities to think, feel, deliberate, or choose in certain ways in the future. But it is logically impossible for two different persons to share the very same *non-dispositional* properties of character.<sup>72</sup> These non-dispositional properties of a person's character record the particular thoughts, feelings, and choices that make up each person's unique mental life history. Each person is logically guaranteed to have a singular mental history in the sense intended because his particular thoughts, feelings, and choices are artifacts of the unique path through space and time that constitutes his own life situation.

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71. Presumably, facts about how a person has thought, deliberated, or chosen in the past play a substantial role in determining the dispositional facts about how he is likely to think, deliberate, or choose in the future. For a philosophical discussion of this issue in the context of the Aristotelian conception of the person, see M.F. Burnyeat, *Aristotle on Learning to be Good*, in *ESSAYS ON ARISTOTLE'S ETHICS* 69 (Amelie Oksenberg Rorty ed., 1980). See *infra* note 73 for the distinction between dispositional and categorical properties of objects.

72. Philosophers customarily draw a distinction between dispositional and non-dispositional properties of objects, and commonly label the latter as "categorical" in nature. Roughly speaking, dispositional properties of objects are expressed by statements that take a subjunctive conditional form, e.g., "if Smith became a lawyer, he *would* have been financially successful," or "if Smith chooses to be a lawyer after graduation, he *will* become financially successful." By contrast, categorical properties of objects are expressed by any assertion not of the subjunctive conditional form, e.g., "Smith is a lawyer," "Smith was a lawyer." Dispositional properties of objects are commonly conceived to be functions of their categorical properties. For example, Smith's disposition to become financially successful in the future may be determined by the categorical property that he is a law school graduate. This distinction between categorical and dispositional properties need not further concern us here. For a somewhat technical discussion of this topic in the context of modern philosophy of language, the interested reader may consult Michael Dummett, *What is a Theory of Meaning? (II)*, in *TRUTH AND MEANING* 67-137 (Gareth Evans & John McDowell eds., 1976).

Hence the idea that character determines personal identity does not contradict but logically coincides with the idea that sameness of person is determined by sameness of biological kind and spatiotemporal route. If A and B have *exactly* the same character (understood to include both mental dispositions to future behavior *and* past mental history), they must be of the same biological kind and have traversed the same spatiotemporal route (and vice-versa).

Of course, if we need to deploy a definitive operational criterion for determining whether two persons are the same in cases of uncertainty, we generally use the criterion of spatiotemporal position/route. Consider, for example, the condundrum of personal identity presented in the French film *Le Retour de Martin Guerre* (The Return of Martin Guerre).<sup>73</sup> The film is based on the true story of a certain 16th century roguish young peasant from the small village of Artigat in the foothills of the Pyrenees in southwestern France.<sup>74</sup> Guerre (played by Gerard Depardieu) disappears shortly after his marriage while serving in the military.<sup>75</sup> Eight years later, a man appears in the village.<sup>76</sup> He claims to be the absent husband, and takes up with the long-forsaken wife.<sup>77</sup> A predictable brouhaha ensues, and Depardieu endeavors to prove his "identity" in part by displaying personal characteristics identical to those of the departed man.<sup>78</sup> The ploy is unmasked in the *denouement*, where the real Martin Guerre, now a grizzled veteran, strides from the gallery to denounce the imposter before the *Parlement* of Toulouse.<sup>79</sup> For our purposes, the story's moral is that sameness of spatiotemporal position, not sameness of character, is the epistemically superior criterion for personal identity. But in practice, we may justly rely on the epistemically subordinate character criterion in contexts where we lack any evidence concerning the former.

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73. LE RETOUR DE MARTIN GUERRE (Societe Francaise de Production Cinematographique 1982).

74. See NATALIE ZEMON DAVIS, THE RETURN OF MARTIN GUERRE 6-18 (1983) (providing an historical analysis of the story of Martin Guerre).

75. See *supra* note 73.

76. See *id.*

77. See *id.*

78. See *id.*

79. See *id.*

## IV. GENETIC STRUCTURE AND PERSONAL IDENTITY

### A. Genes and Character

If the psychologically and socially interesting criterion of personal identity is sameness of character, we may naturally inquire whether DNA structure has some fundamental role to play in shaping it. A person's DNA structure determines a virtually indefinite number of physical traits possessed by an individual, from height, eye color, sex, and race, down to the shapes of a person's toes.<sup>80</sup> We also have some reason to suppose that many of a person's mental traits and dispositions have a genetic foundation. Scientists have in fact isolated certain genes that indicate an increased susceptibility to certain diseases, for example, Down's Syndrome and Huntington's Disease.<sup>81</sup> Moreover, there is some evidence, albeit far from conclusive, that a person's IQ, emotional temperament, and certain other mental qualities have causal antecedents in his genetic structure.<sup>82</sup> To what extent, then, might a person's character be determined by the features of his DNA blueprint? *A priori* there are three possible answers here. First, *all* properties of a person's character might be causally pre-determined by his DNA structure. Label this the thesis of "Strong Genetic Determinism." The second thesis, which may be called "Semi-Strong Genetic Determinism," is that *some* properties of a person's character are causally pre-determined by his DNA structure, but other properties are not.<sup>83</sup> Third, DNA structure

80. Of course not all physical traits are determined by a person's DNA blueprint. An equally indefinite number of physical traits may be acquired as a result of external events, accidents, or intentional behavior. Macroscopic bodily parts and functions may be altered or removed through diet, exercise, injury, medical treatment, tattoos, and so on. Even a person's DNA blueprint itself may be mutated as a result of exposure to radiation or to chemical carcinogens. However, there must be outer limits to the degrees of genetic change that a person may undergo before ceasing to belong to a given biological kind.

81. See Caskey, *supra* note 14, at 116-19 (stating that scientists now have the ability to test for myriad other diseases using DNA-based methods).

82. See generally Daniel Koshland, Jr., *Nature, Nurture and Behavior*, 235 SCIENCE 1445 (1987) (summarizing and discussing the ramifications of research suggesting a genetic component of manic-depression and schizophrenia).

83. Presumably, those properties of a person's character which are not fixed in advance by his DNA structure reflect the workings of a free will whose precise operation is not causally necessitated by any antecedent biological or physical laws. See discussion *supra*, Parts III.B.,

merely *influences* but does not causally pre-ordain *any* of the properties that make up a person's character. Label this the thesis of "Weak Genetic Determinism." I shall evaluate each of these options in the next two sections.

But before we consider these three theses about the relation between genes and character, a preliminary clarification about the general concept of genetic determinism is in order. To say that certain properties of a person's character are causally pre-determined by his genes is not to preclude the causal influence of factors in the external physical environment. Some genetically ingrained traits, e.g. the symptoms of Huntington's Disease, may be exhibited by a person regardless of his physical environment or upbringing. But other genetically determined traits may be latent and depend for their expression upon certain causal interactions between the individual and his external environment. For example, a person with a genetic disposition to alcoholism may never express this behavior if he lacks any opportunity to imbibe intoxicating beverages. As such, the idea that certain properties of a person's character are causally pre-determined by his genes should be understood to include both possibilities. If a person has a genetically determined character trait, this may be because his genes pre-determine the expression of this trait without regard to any influences in his external environment. Alternatively, a character trait may be genetically pre-determined if it is a direct result of causal interactions between the person's DNA structure and factors in his external environment. By comparison, if a person's character trait is *not* causally pre-determined by his genes, this implies that the trait is *neither* pre-determined by his genetic structure alone *nor* that it is pre-determined by causal interactions between his genetic structure and the external physical environment. To simplify the foregoing exposition, I shall just describe character traits as either "causally pre-determined" or "not causally pre-determined" by DNA structure. But the reader should keep in mind that "causally pre-determined" means either exclusive determination by genes alone or exclusive determination by genes plus causal factors

in the external environment.

### B. Strong Genetic Determinism

According to Strong Genetic Determinism, all aspects of the particular character a person develops during his life history are causally pre-determined by his DNA structure. Strong Genetic Determinism is thus equivalent to the claim that all of a person's mental states and mental dispositions — his past and present thoughts, feelings, and choices, along with his various propensities to think, feel, and choose in certain ways in the future — are direct causal products of his DNA structure. On this view, if God knew the scientific laws governing a person's DNA structure and all the scientific laws governing the remainder of the universe, He should be able to predict the present and future course of that person's life history.<sup>84</sup> Strong Genetic Determinism implies that a person is not really free to think, deliberate, choose, or act differently from the ways in which he actually does so. By contrast, our ordinary conception of a person as an autonomous rational agent implies that persons can deliberate and freely choose between two or more alternative courses of action. To say that a person freely chooses one course of action over another — for example, to pursue a legal career over a medical one — is to imply that the person *could have* chosen to become a doctor instead of a lawyer even though he did not actually do so. Strong Genetic Determinism

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84. This conjecture is but a special case of the basic concept of causal determinism that has animated classical physical theory since Newton. According to this conception, every physical event is theoretically pre-ordained by antecedent physical laws governing a set of initial conditions that were obtained at the birth of the universe. In modern times, this conception has been undermined by the intrinsically probabilistic "Copenhagen interpretation" of quantum mechanics. As such, the deterministic assumptions of classical physics are considered highly controversial and quite probably erroneous by a working majority of contemporary physicists. For an accessible discussion, see PENROSE, *supra* note 59, at 149-301. This fact bears some significance to the debate about free will and character that plays a central role in Part III of this Article. Quantum mechanics does not offer any positive explanation of how free will is possible. But it does leave some metaphysical room for the phenomenon of a free will in a world governed by universal physical laws. *See id.* at 296-99. This is not to say that the quantum mechanical picture is certainly correct. Indeed, some of its predictions clash with Einstein's Theory of General Relativity and to date no one has successfully reconciled the local conflicts between these two theories. *See id.* at 391-481. For present purposes, the moral is simply that the globally deterministic assumption of classical physics ought not to be accepted uncritically or regarded as beyond serious scientific dispute.

denies that people really have this power of free choice. According to it, the actual outcomes of all a person's deliberations are causally pre-ordained by interactions between his genetic structure and the environment. We may think that we are free to choose between a legal or medical career, and between sleeping late or getting to the office early. But according to Strong Genetic Determinism, the phenomenal feeling of free will we experience in everyday life must be explained away as a peculiar albeit persistent illusion. Our genetic structure is the dominant causal *arbiter* of all that we think, feel, and choose to do.

The idea that intentional human behavior is, despite appearances, not really the product of a free will did not, of course, originate with the birth of genetic science. Philosophers and scientists throughout the ages have speculated that allegedly free human actions might be causally pre-ordained, and hence predictable in theory, by antecedent laws of nature. Genetic science simply presents a hitherto undiscovered causal mechanism as a candidate through which such universal laws of human behavior might operate. Fifty years before the discovery of DNA, the most popular candidate for such a mechanism was probably Freud's dynamic account of the psyche in terms of id, ego, and super ego. It is impossible to prove or disprove with *a priori* certainty the general conjecture that all human behavior is causally pre-ordained by *any* laws of nature, let alone that it is causally pre-ordained by the laws of genetics. However, from a common sense and legal perspective, there is a compelling practical reason for retaining the idea of free will and rejecting Strong Genetic Determinism in particular. This reason is the fact that the Strong Thesis would wreak havoc on our ordinary conceptions of ethically responsible agency and moral desert.<sup>85</sup>

According to our traditional concept of moral responsibili-

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85. For an elucidation of this point in the more general context of the debate between defenders of free will and advocates of causal pre-determinism, see P.F. Strawson, *Freedom and Resentment*, in *FREEDOM AND RESENTMENT AND OTHER ESSAYS* 1-25 (1974). For discussion in a genetics context, see Dan W. Brock, *The Human Genome Project and Human Identity*, in *GENES AND HUMAN SELF-KNOWLEDGE* 18, 23-28 (F. Weir et. al. eds., 1994) (discussing the pros and cons of the Human Genome Project and its results with respect to genetic predisposition in human behavior).

ty, a person is morally responsible only for those actions that reflect the operation of a free will. Actions performed of free will are voluntary — they reflect choices of the person that could have been made otherwise than they were. To the extent that a person truly could not have chosen to act in a way other than he did, we refuse to hold him morally responsible (viz., blame or punish him) for the consequences of his action.<sup>86</sup> The idea of free and voluntary action as the wellspring of moral responsibility is, of course, a foundational presupposition of legal responsibility.<sup>87</sup> In general, an *actus reus* is an essential element of criminal offenses, of liability in tort, and of valid formation of private contracts.<sup>88</sup> However, if Strong Genetic Determinism were accepted, this implies that concepts of free will and *actus reus* must, in fact, be empty ones. Strong Genetic Determinism would thus nullify the deep-seated conceptual foundation for our existing practices of assigning moral praise and blame and justifying the imposition of legal sanctions. But we simply have no plausible idea how to reinterpret, revise, or justify our existing moral and legal practices on the assumption that the familiar concepts of free will and *actus reus* are empty.<sup>89</sup> As the philosopher Immanuel Kant once suggested in this regard, we may not be able to give a satisfying theoretical explanation of how free will is possible; but as rational deliberating agents, we cannot *act* practically except under the assumption that our wills are capable of free choice.<sup>90</sup> So it goes for the understanding and justification of

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86. For a classic discussion of the relation between free will and moral desert in a legal context, see generally H.L.A. HART, PUNISHMENT AND RESPONSIBILITY (1968) (drawing “attention to the analogy between conditions that are treated by criminal law as *excusing* conditions and certain similar conditions that are treated in another branch of law as *invalidating* certain civil transactions”).

87. See *id.* (stating that the law requires that “as a condition of liability to punishment, that the person to be punished should, at the time of his offence, have had a certain knowledge of intention or possessed certain powers of understanding and control”); Peter Arenella, *Convicting the Morally Blameless: Reassessing the Relationship Between Legal and Moral Accountability*, 39 UCLA L. REV. 1511, 1524-25 (1992) (discussing the current status of legal and moral accountability and “changes that might occur if the criminal law were to make a more honest attempt to limit criminal liability to morally accountable actors”).

88. Of course, there are exceptions to the principle that an *actus reus* is a predicate to legal sanction, e.g., the doctrine of strict liability in tort. Such exceptions are rare, however, and do not detract from the foundational status of the principle.

89. See Strawson, *supra* note 85.

90. Kant stated: “As a rational being . . . man can never conceive the causality of his own

our moral and legal practices — we cannot make sense of them except under the assumption that free will is possible. Hence, let us dismiss Strong Genetic Determinism on the ground that we have compelling practical reason for rejecting a theory of character and personhood which simply leaves no space at all for the exercise of free will.<sup>91</sup>

We may further observe that the claims of Strong Genetic Determinism are particularly vulnerable to empirical refutation by further scientific research. For example, Strong Genetic Determinism implies that persons who share the same DNA blueprint, that is, identical twins or genetically engineered human clones, will behave in exactly the same ways. For example, suppose one identical twin embarks upon a life of violent crime. Strong Genetic Determinism entails that the other twin is doomed to engage in equally criminal pursuits provided that both twins have the same life circumstances and upbringing. Empirical studies have shown that identical twins frequently exhibit remarkable similarities of character and temperament.<sup>92</sup> But empirical research has not shown, and is unlikely to prove, that identical twins are causally pre-destined to make exactly the same kinds of choices in life.<sup>93</sup> As an empirical matter, identical twins do exhibit a substantial degree of variation in the kinds of life choices they make. Of course, one could attribute some differences in the kinds of choices made by identical twins to different external influences in their re-

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will except under the Idea of freedom; for to be independent of determinism by causes in the sensible world (and this is what reason must always attribute to itself) is to be free. To the Idea of freedom there is inseparably attached the concept of *autonomy*, . . . A principle which in Idea forms the ground for all actions of *rational* beings, just as the law of nature does for [physical phenomena] . . .” IMMANUEL KANT, *GROUNDWORK OF THE METAPHYSIC OF MORALS* 120 (H.J. Paton trans., Harper Torchbooks 1964) (1948).

91. Readers interested in the general topic of free will may find a useful collection of articles in *FREE WILL* (Gary Watson ed., 1990). See also Bernard Williams, *How Free Does the Will Need to Be?*, in *MAKING SENSE OF HUMANITY AND OTHER PHILOSOPHICAL PAPERS* 1982-1993, 3-21 (1995) [hereinafter *How Free*] (distinguishing freedom of will, “our freedom as agents,” from political or social freedom, and noting that only the latter comes in degrees); David Wiggins, *Towards a Reasonable Libertarianism*, in *NEEDS, VALUES, TRUTH* 269 (2nd ed. 1991) (discussing the libertarian view of free will).

92. See Lawrence Wright, *We Two Are One*, *GUARDIAN*, Oct. 14, 1995, at 13, 16-18 (discussing some characteristics frequently shared by twins).

93. For a general review of the current state of empirical research bearing upon this issue, see generally Charles C. Mann, *Behavioral Genetics in Transition*, 264 *SCIENCE* 1686 (1994) (discussing the difficulties scientists encounter in trying to identify which genes influence particular human behaviors).



spective upbringings and environments. But even if identical twins tend to choose and deliberate in similar ways once external influences are controlled for, it is hard to believe that each twin lacks *any* freedom to choose differently from his sibling. Proponents of Strong Genetic Determinism may stick to their guns and postulate that any difference in choices must be explained by disparate influences of environmental factors; but this assumption is tantamount to the claim that there is no space at all in the world for the exercise of free will. As stated previously, this view should be rejected as inconsistent with our elementary concepts of moral and legal responsibility.

### C. Semi-Strong and Weak Genetic Determinism

By contrast, the theory that I have called Semi-Strong Genetic Determinism does leave some space for free will. It holds that some properties of a person's character are fixed by his DNA structure but other properties are not. For example, it may be that some or all aspects of a person's intellectual and emotional temperament are pre-ordained by his genes. Perhaps these include his capacity for mathematical reasoning, his disposition to altruistic behavior, or his susceptibility to depression. But other properties and dispositions of his character are not. Let us suppose his genetic structure does not causally pre-ordain his choice to become a mathematician instead of a lawyer, nor his disposition to engage in criminal behavior. Instead, these features of his character are the products of his own free will. They are contingent artifacts of character developed through the individual's autonomous expression of his own unique personality. Many people would no doubt find Semi-Strong Genetic Determinism intuitively quite plausible. Before passing judgment upon it, let us compare it with Weak Genetic Determinism.

Weak Genetic Determinism holds that DNA structure influences but does not causally pre-ordain *any* of the properties that make up a person's character. Weak Genetic Determinism does not assert that genetic structure plays no role at all in determining a person's character. It would be foolish to deny that a person's DNA-defined properties have a significant causal role that influences the kinds of choices he makes and

the character he develops throughout his life history. Rather, Weak Genetic Determinism holds only that a person's genetic traits do not of themselves causally pre-determine the particular choices that a person makes or the particular character he happens to develop. As such, Weak Genetic Determinism embodies a basically Kantian picture of practical reasoning and moral agency. Kant acknowledged that human beings were prompted to act in various ways by their biologically implanted instincts.<sup>94</sup> He also held that, as rational agents blessed with the power of free will, human beings have the capacity to choose whether or not to act in accordance with their biologically determined inclinations.<sup>95</sup>

Consider the genetically ingrained disposition to feed one's self. A person's genetic structure causes him to feel hungry whenever he enters a metabolic state of malnourishment. In the normal course of affairs, a person who feels hungry will be disposed to eat something if presented with the opportunity. But this is not always the case. A prisoner of conscience may resolve to starve to death unless certain political conditions are changed. The hunger striker will be prompted by his genetic structure to feel progressively more intense hunger pains. But if he has the requisite strength of will, he will not be disposed to eat anything and can refuse food even unto death. Generalizing from this sort of case, Weak Genetic Determinism allows that a person's genetic structure may cause him to have certain thoughts, feelings, or emotions, and hence "prompt" him to make certain kinds of choices or engage in certain kinds of behavior. But a person's genetic structure cannot of itself compel him to *act* on these thoughts, feelings, or emotions. Instead, Weak Genetic Determinism holds that no genetically prompted thought, feeling, or inclination can cause a person to behave intentionally *unless* he first chooses of his own free will to act in accordance with that prompting. In short, Weak Genetic Determinism implies that persons have the theoretical capacity to act against any of their genetically based inclinations.<sup>96</sup> Persons have the capacity to act contrary to

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94. See Kant, *supra* note 90, at 118-31 (arguing that the concepts of freedom causal necessity in the natural world are compatible).

95. See *id.*

96. In a complete account of Weak Genetic Determinism, we might want to posit a dis-

their genetic inclinations even if, for the most part, they actually choose to conform their voluntary behavior to these promptings.

To illustrate the difference between the Semi-Strong and Weak Genetic determinism, consider the different analyses that each theory might give of the fact that a poor person has chosen to commit some criminal action like robbing a bank. Let us assume that this person has a genetic trait, perhaps it is a double "Y" chromosome, which disposes him towards aggressive, self-seeking behavior.<sup>97</sup> Let us further suppose this genetic trait may cause the poor person to have certain thoughts or feelings as a result of his financial status, just like the genetic trait which causes him to feel hunger whenever he enters a metabolic state of malnourishment. On Weak Genetic Determinism this genetic trait may prompt the poor person with an impulse to rob the bank, but it does not of itself causally pre-determine his doing so in the circumstances. The person is free to choose of his own free will whether to follow this genetic impulse or not, and may be held morally and legally accountable for failing to resist it. By contrast, Semi-Strong Genetic Determinism leaves open the possibility that the poor person may have acted intentionally without having acted freely. It

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distinction between two levels of control that a person could have over his genetic inclinations. In the first category, we might have genetic inclinations like hunger that can be completely overridden by a person's conscious exercise of will. In the second category, we might have genetic inclinations to actions which can sometimes, but perhaps not always, be overridden by an exercise of will, e.g., a person's genetic inclination to breathe or to flinch at an object moving rapidly towards him. Perhaps some people have the strength of will to hold their breath until they lose consciousness, or to refrain from flinching at a hammer blow no matter how certain the probability of harmful impact. However, it is not clear that a person has a standing ability to ignore the genetic inclination to breathe or to flinch in the presence of harmful blows. Therefore, we might want to distinguish between types of genetic inclinations that are subject to total or to partial control by a person's free will. At the same time, this distinction should not play any substantial role in the account of the relation between genes and character developed in this paper. See discussion *supra*, Part III.D. I shall argue that regardless of whether we accept Weak or Semi-Strong Genetic Determinism, the essential ingredients of a person's character are constituted only by behavior that is subject to complete control by the person's free will.

97. The genotypes of most human males carry a single "Y" chromosome, but some contain two occurrences of this chromosome. Some empirical evidence suggests that the minority of males who have the double "Y" chromosome are at statistically greater risk of engaging in violent criminal behavior. See P. B. Whatmore, *Behaviour Disorders and Pattern of Crime Among XYY Males Identified at a Maximum Security Hospital*, 1 BRIT. MED. J. 533 (1967). For a discussion of this data in a legal context, see Kenneth J. Burke, *The 'XYY Syndrome': Genetics, Behavior and the Law*, 46 DENV. L. J. 261, 263-64 (1969).

may not have been possible for him to resist the genetic impulse to rob the bank because his genetic structure causally pre-ordains such intentionally criminal behavior in the circumstances. If the person were truly not free to act differently, then (in theory) he should not be held morally and legally responsible for his actions.

What then, is the most plausible theory of the relation between character and genetic structure? The Semi-Strong Genetic Determinism that holds some, but not all, properties of a person's character are causally pre-determined by his genes? Or the Weak Genetic Determinism that holds that DNA structure merely influences but does not causally pre-ordain any of the properties that define a person's character? Significantly, we do not have to decide this question to elucidate the most important features of the relation between character and genetic structure. As far as a person's character is concerned, the difference between Semi-Strong and Weak Genetic Determinism is not a difference in kind, but merely one of degree. Given that we may rightly insist upon retaining some space of free action for the exercise of one's autonomous will, the distinction between Semi-Strong and Weak Genetic Determinism simply reflects two different drawings of the boundaries of this space. Weak Genetic Determinism asserts that the space of free action coincides with the space of intentional human behavior, that all free actions are intentionally chosen (and vice-versa). By contrast, Semi-Strong Genetic Determinism asserts that the space of free action is more restricted than the space of intentional behavior. It claims that all free actions are intentionally chosen, but some intentional choices — those causally pre-determined by a person's genetic structure — may not correspond to free actions. Acceptance of either the Semi-Strong or Weak Genetic Determinism does have significantly different practical consequences for the application of our ordinary concepts of moral and legal responsibility. But a choice between them does not change the fundamental picture of the relation between character and genetic structure. Hence, for our purposes, we may remain justifiably indifferent to the choice between them. The reason for this indifference is that, to us, the most important ingredients of a person's character will be the features which a person expresses as artifacts of his own freely

choosing will.

Before elaborating why this is so in the next section, I want to note in passing that one might plausibly extrapolate within our legal system an implicit agnosticism and/or ambivalence over the choice between Semi-Strong and Weak Genetic Determinism. (We have already seen that Strong Genetic Determinism conflicts with fundamental precepts about free will and moral responsibility presupposed by actual legal practice.)

To illustrate, consider the legal defense of insanity for criminal offenses. It is not implausible that many, perhaps even all, legally excusing mental illnesses are caused in whole or in part by defective genetic traits. Hence it is instructive to examine the insanity defense with this pathological correspondence in mind. Perhaps half of the states currently employ a two-pronged standard for the insanity defense.<sup>98</sup> The first prong is a cognitive test. It excuses a criminal defendant from legal responsibility if, due to mental illness, he either did not know the nature of the act he committed or that an act of this nature was wrong. The second prong is a volitional test. It excuses the defendant if, due to mental illness, he was subject to an "uncontrollable" impulse that caused him to act wrongfully notwithstanding specific knowledge that the act was wrongful. In the present context, the cognitive test mirrors the standard of Weak Genetic Determinism. It implicitly charges a defendant with legal responsibility for *all* his intentional actions. But the cognitive test will carve out an excuse where the defendant intentionally commits an act that is wrongful but, due to mental illness of genetic origin, does not intentionally commit an act he *believes* to be wrongful. By comparison, the volitional test is consistent with the standard of Semi-Strong Genetic Determinism. The volitional test will absolve a defendant of responsibility for intentional and knowingly wrongful action if, due to mental illness of genetic origin, the defendant was incapable (or substantially incapable) of refraining from such action at that time.

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98. For a complete list of state and federal rules current as of 1980, see Robert J. Favole, *Mental Disability in the American Criminal Process: A Four Issue Survey*, in 6 *MENTALLY DISORDERED OFFENDERS: PERSPECTIVES FROM LAW AND SOCIAL SCIENCE* 247, 257-69 (John Monahan & Henry Steadman eds., 1983).

It is not appropriate to review the evolution of insanity defense jurisprudence at any length here. But roughly speaking, the insanity defense first appeared in Anglo-American common law as a cognitive test.<sup>99</sup> Progressive dissatisfaction with an exclusively cognitive standard, undoubtedly influenced by the advent of modern psychiatric theory, led to widespread incorporation of an independent volitional prong.<sup>100</sup> In recent times, the volitional prong has fallen out of favor with legal commentators and the lay population. In response, the federal government and a number of states have repudiated the volitional prong and retreated back to an exclusively cognitive standard.<sup>101</sup> Arguably, this history testifies implicitly to agnosticism and ambivalence within the legal system about the choice between Semi-Strong and Weak Genetic Determinism.

#### D. The Essential Relation Between Genes and Character

Let us return to confront the question about the need to choose between Semi-Strong and Weak Genetic Determinism. Previously I asserted that we may remain justifiably agnostic about this choice — at least as far as our picture of the fundamental relation between genetic traits and a person's character

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99. The seminal case here is *M'Naghten's case*, 8 Eng. Rep. 718 (1843) (holding that a criminal defendant may be found not guilty by reason of insanity if he either did not know the nature and quality of his act or that the act in question was wrong).

100. An early and influential decision embracing the volitional test is *Parsons v. State*, 2 So. 854, 859 (Ala. 1887) (holding that a defendant is not guilty by reason of insanity if, due to mental disease, he had lost the power of free will to choose between right and wrong at the time the criminal act was committed). See also MODEL PENAL CODE § 4.01(1) (Official Draft 1962) (stating that a defendant may be acquitted by reason of insanity if he lacked either the substantial capacity to "appreciate the criminality" of his conduct or to "conform his conduct to the requirements of law").

101. Popular dissatisfaction with the volitional prong came to a head in the aftermath of John Hinckley's insanity acquittal for the attempted assassination of President Reagan. Partially in response to the public outcry, Congress passed a new federal insanity statute, The Insanity Defense Act of 1981, 18 U.S.C. § 17 (1994), all but eliminated the volitional element in federal law in favor of reliance on an exhaustively cognitive standard. See generally PHILLIP JOHNSON, CRIMINAL LAW, CASES, MATERIALS, AND TEXT 319 (4th ed. 1990). See also *U.S. v. Lyons*, 731 F.2d 243 (5th Cir. 1984), cert. denied, 469 U.S. 930 (1984) (holding "that a person is not responsible for criminal conduct on the grounds of insanity only if at the time of that conduct, as a result of a mental disease or defect, he is unable to appreciate the wrongfulness of that conduct"). In the state arena, California adopted the two-pronged standard from the American Law Institute's Model Penal Code. See *People v. Drew*, 583 P.2d 1318, 1326 (Cal. 1978). But in 1982, California voters approved a new statute that eliminated the volitional prong and imposed a strict and exclusively cognitive test. See JOHNSON, *supra*, at 344-45.

is concerned. To explain why this is so, let us set aside the idea of a person's genetically determined mental traits and just consider the relation between a person's character and his DNA-defined physical traits.

A person's physical traits obviously contribute in important ways towards the determination of his character. For example, the kinds of choices that a person confronts and makes during his life history are clearly shaped by his height, looks, body morphology, susceptibility to medical diseases, and so on. A person's physical attributes may confine or extend the space of choices available to the free exercise of his will. If someone is born with the body structure of an NFL linebacker, he may have the ability to choose whether or not to bench-press a 500 pound weight. But for the rest of us, this is not an option no matter how intense our exercise regime. Similarly, if someone is blessed with extremely agile fingers and perfect pitch, she may have the ability to choose whether to become a world class violinist. But less gifted people do not have the luxury of this career choice. A person's physical traits contribute to the determination of his character insofar as they set upper and lower boundaries on what he can or cannot successfully choose to accomplish or do. But these physical traits do not causally pre-determine the particular character that the person will develop. Instead, a person's physical traits simply define a space of background possibilities within which he is free to develop a unique character through the operation of his autonomous will. A person's physical traits are, so to speak, the raw material out of which his character is created, but they are not to be identified with the finished product.

Now let us consider the relation of a person's character to his genetically defined mental traits (whatever they may be). If a person's genetic traits pre-determine some features of his intentional behavior, then, like his physical traits, they set upper and lower boundaries on what he can or cannot successfully choose to do. A person with an inexorable genetic disposition towards altruistic behavior may be incapable of intentionally choosing to act in immoral ways. Conversely, a person with an immutable genetic disposition to aggressive self-seeking behavior may be incapable of conforming his behavior to moral strictures. Should we say that it is part of the character

of the first person to choose like a saint and the second to choose like a sinner? In one sense, yes. But in a deeper sense, the answer should be no. Our concept of a *person's* character is that of a rational agent blessed with the power of free will. Moreover, a *person's* character is necessarily an object of ethical evaluation, the bearer of moral praise and blame.<sup>102</sup> Consequently, a person's character is distinguished in its essentials as the artifact of morally appraisable choices expressed through his autonomous will. By contrast, the kind of character that we ascribe to non-rational animals is not a fitting object of moral appraisal. Non-rational animals have no free will; they have no alternative but to conform with the promptings of their genetically implanted instincts.<sup>103</sup> Thus, we do not subject them to moral praise or blame, and we may rightly insist on a difference in essence between person and animal characters.

What then, are we to say about the characters of the genetically determined saint or sinner? Should we count the saint's genetically pre-determined beneficence, or the sinner's iniquity, as part of their essentially human characters? I suggest not. If a person is genetically programmed to be incapable of anything but altruistic behavior, we should not laud this behavior as a morally admirable feature of his character. The altruistic aspects of the person's conduct may be useful or pleasing to

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102. The idea that a person's character is an intrinsic object of moral assessment has ancient roots dating back at least to the time of Aristotle. For philosophical discussions of free will and personhood, see generally Harry G. Frankfurt, *Freedom of the Will and the Concept of a Person*, 68 J. PHIL. 5 (1971); Irwin, *supra* note 46, at 139-42 (discussing whether a person's character is the product of his environment and the amount of responsibility that can be attached to his actions); Gary Watson, *Free Agency*, 72 J. PHIL. 205 (1975) (comparing and contrasting the views of Plato and Frankfurt regarding whether the concept of free will exists); Williams, *How Free*, *supra* note 91, at 27-32 (discussing character and responsibility for actions).

103. A few caveats are necessary here. First, it is true by definition that non-rational animals lack free will. But it is also possible that some animals, e.g., dolphins and the higher primates, possess rudimentary reasoning abilities. Certain non-human animals may one day demonstrate deliberative reasoning capacities approximating those of human beings. If so, we may justly attribute some measure of free will to these animals and perhaps even treat them as subjects of moral assessment. The second caveat is that even if non-rational animals lack free will, this is not to imply that their genetically ingrained behavior is incapable of modification through training. For example, rats might be trained to ignore food that is surrounded by an electrified grill. However, such training does not cause a non-rational animal to choose freely against its genetic inclinations. It simply causes the rat to act on one kind of genetically ingrained inclination over another. In sum, we can modify the behavior of non-rational animals by altering the character of the physical environment in which they are embedded. This observation is entirely consistent with the idea that non-rational animal behavior is causally pre-determined by interactions between its genetic structure and its external environment.



us, but they do not warrant moral esteem anymore than, say, the genetically selected docility of a dairy cow. Conversely, if a person is genetically programmed to emit self-serving and violent behavior, we cannot justifiably deplore this as a morally reprehensible aspect of his character. We may incarcerate such a dangerous individual to safeguard the common weal. But we cannot regard this aspect of his behavior as the bearer of moral blame — anymore than we can the conduct of a tiger or a great white shark. More generally, if a person's genetic structure determines that some instances of his intentional behavior are not the product of his own free will, then to that extent this genetically compelled behavior is *not* an ingredient of the morally assessable, essentially human character that is *him*. If a person has genetically determined mental traits, these traits should bear the same kind of relation to his essentially human character as his genetically determined physical traits. That is, genetically determined mental traits would merely function — like physical traits of genetic origin — as parameters that fix a space of background possibilities within which a human being is free to develop a unique character through exercise of his own autonomous will. In sum, a person's genetically defined traits — be they physical or mental in nature — are nothing but the raw materials out of which his character is created. They ought not to be confused with the finished product.

Let us take stock of the discussion so far. We have seen that DNA structure is not a logically sufficient condition for personal identity, because two or more persons can share the same genetic blueprint. The logically necessary and sufficient condition for personal identity is sameness of biological kind (*viz.* human) and sameness of spatiotemporal position or route. We have also evaluated the psychologically important concept of character as an alternative but logically coincident criterion of personal identity. We saw that a person's character is distinguished from the kinds of character we ascribe to non-rational animals in being a fitting object of moral appraisal. Since moral praise or blame can only accrue to behavior that is the product of a person's free will, the essence of a person's character is created by the autonomous choices he confronts and makes over the course of his life history. It follows that a

person's genetically ingrained traits, be they physical or mental, are not to be regarded as essential determinants of his character. A person's genetic traits are merely a set of parameters that fix a background space of possibilities within which the person is free to create a unique character by exercise of his own free will.

What then may we conclude by way of final analysis about the relation between an individual's DNA structure and his personal identity? First, DNA structure can, of course, be regarded as a necessary condition for personal identity. No two individuals A and B can be the same person unless they have the same DNA blueprint. However, DNA structure should not be conflated with the "essential encoder" of an immutable personal identity or character. Qua character, the essence of a person's identity is encoded in the contingent, genetically non-predetermined facts about what a person freely chooses to *do* with his life while wending his way through the spatiotemporal world.

## V. CONCLUSION

It is not my purpose here to offer detailed suggestions as to how courts and legislatures should imbue an individual's right to genetic privacy with positive content. Rather, my aim is largely negative in character. It is to debunk the widely influential idea that DNA constitutes the "Holy Grail" of personal identity and, by implication, that DNA information merits exceptional legal protection under the right to privacy for that reason. The impending completion of the Human Genome Initiative, not to mention the startling news that genetic scientists have recently amassed technical "know-how" sufficient for the cloning of entire human beings, is liable to prompt increasingly strident calls to treat DNA with factually irrational reverence as the "essential encoder" of human personality. These calls should be properly resisted. Recent and impending advances in genetic science do not warrant any transformation of our concept of personal identity or character into essentially genetic terms. Genetic traits, be they mental or physical in nature, are simply the raw material from which an individual creates a unique character through the operation of his own autonomous

will. Consequently, legislatures and courts should resist pressure to give DNA information special legal protection that derives from the misguided idea that DNA constitutes the sacred essence of an individual's personal identity.

This is not of course to imply that an individual has no legally protected privacy interest in his own genetic information. We should still acknowledge that genetic information deserves substantial legal protection for much the same reasons as ordinary medical information. An individual's DNA blueprint contains a great deal of information that has, or will be discovered to have, substantial medical applications for the diagnosis, prevention, and treatment of disease. If genetic information has actual or foreseeable medical consequences, it should trigger the kinds of legal safeguards traditionally applied to protect the privacy of more mundane varieties of medically significant information.<sup>104</sup> To extract medical information, health care practitioners must inform patients of the significance of this data and the nature of the procedures used to acquire it. The patient, so informed, must then voluntarily consent to the extraction of this information from his person. Once acquired, the disclosure of this medical information to third parties is subject to the principle of doctor-patient confidentiality. In general, this principle entails that information contained in an individual's medical records is made available only to recipients that are authorized with a legal right of access, and then only on a "need-to-know" basis.<sup>105</sup> The extraction or use of genetic information for both medical and non-medical purposes should be subject to a similar set of legal constraints.

DNA information may of course be distinguished from ordinary medical information in regard to the relative strength

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104. On the legal rules that govern the acquisition and use of medical information, see generally GEORGE J. ANNAS, *THE RIGHTS OF PATIENTS: THE BASIC ACLU GUIDE TO PATIENT RIGHTS* 160-95 (2nd ed. 1989). For a proposed model of legal rules protecting the privacy of DNA data that draws on principles governing the acquisition and use of medical information, see Annas, *supra* note 8, at 2348-49. See generally John C. Fletcher & Dorothy C. Wertz, *Ethics, Law, and Medical Genetics: After the Human Genome is Mapped*, 39 EMORY L. J. 747 (1990) (discussing ethical issues and proposing social policies); Janet A. Kobrin, *Confidentiality of Genetic Information*, 30 UCLA L. Rev. 1283 (1983) (discussing genetic screening techniques and proposing legislative guidelines to regulate disclosure of genetic information).

105. See, e.g., Annas, *supra* note 8, at 2348.

and scope of scientific predictions that can be predicated upon it. For example, we can make more comprehensive predictions from the observation that an individual has the gene for Sickle cell disease than we can from the observation that he has abnormally low hemoglobin levels in his blood. At the same time, we should keep in mind the fact that the distinction between genetic information and ordinary medical information about a person's body is a difference of degree, not of kind. The perhaps unprecedented predictive strength of genetic information should not be mistaken for the hallowed ground of personal identity itself. DNA information should no more be conflated with the "sacred vessel" of an individual's inviolate personality than should ordinary medical information about his blood type or white cell count. In their endeavors to fashion new legal safeguards, legislatures and courts should not succumb to the influence of the popular, but ultimately irrational, idea that DNA is the essence of human personality.

