The Cassandra Complex: An Employer's Dilemma in the Genetic Workplace

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NOTE

THE CASSANDRA COMPLEX: AN EMPLOYER’S DILEMMA IN THE GENETIC WORKPLACE

CONTENTS

I. INTRODUCTION ................................................................. 412

II. HISTORICAL BACKGROUND .................................................. 413
   A. The Eugenic Movement: 
      The Quest for the “Perfect Person” .................................. 413
   B. Eugenics in the United States Workplace: 
      The Quest for the “Perfect Worker” ............................... 417
       1. Sickle Cell Screening .............................................. 418
       2. Enzyme Testing ...................................................... 420
   C. Congressional Interest in Genetic Monitoring and Screening .............................................. 424

III. THE HUMAN GENOME PROJECT .......................................... 426
   A. Origins ............................................................................ 426
   B. Project Planning and Organization .................................. 430
   C. Project Progress ............................................................ 432
   D. Progress in Ethical Considerations ................................ 434

IV. LEGISLATIVE ACTION AND INACTION ................................... 437
   A. State Response ............................................................. 438
   B. Federal Response .......................................................... 441
   C. Administrative Guidance ............................................... 446

V. THE CASSANDRA COMPLEX ................................................ 447
   A. To Test or Not to Test? .................................................. 449
   B. “Heads You Lose”: Liability for Using Genetic Information .............................................. 452
   C. “Tails You Lose”: Liability for Not Using Genetic Information .............................................. 460

411
The next time Apollo “caught at love,” he sought to get love back by promising to teach Cassandra the art of prophecy. He kept his promise, but Cassandra still refused to be his lover. Divine gifts, once given, cannot be withdrawn, so Apollo’s revenge was that she could keep her gift of prophecy but that no one would believe her.1

I. INTRODUCTION

Like the conflicted Cassandra, an employer in the new millennium will face a baffling legal predicament. Advances in genetic research could potentially enable the employer to “predict the future” by providing him with information regarding the genetic make-up of current and prospective employees. Equipped with this crystal ball, the employer might be able to foresee the possibility that certain employees will incur costly and debilitating diseases or that they will fall victim to substance addiction, mental illness, or criminal propensities. But, as in the myth of Cassandra, without clear guidance on the legal and ethical use of this gift, the gift will prove to be virtually useless. Under the statutory restrictions imposed by the Rehabilitation Act of 1973 2 and its successor, the Americans with Disabilities Act of 1990 (“ADA”),3 an employer will not be able to use this information to make employment decisions without risking liability for employment discrimination.

However, closing one’s eyes to this information will be equally problematic. Under the common law doctrines of negligent hiring, negligent retention, and negligent entrustment, an employer may be held responsible to third parties for the damage or injuries caused by an employee’s illness or dangerous propensity that the employer could have anticipated and prevented. The employer of the next millennium, therefore, will face the prospect of liability for failing to act on the genetic information he is statutorily preempted from accessing.

Part I of this Note gives an overview of past experiments with genetic predisposition and determinism, including the quest for the “perfect person” embodied by the “Eugenic Movement” of the late

nineteenth and early twentieth centuries, and the quest for the "perfect worker" undertaken by American employers since the 1940s. Part II examines the origins, goals, organization, and progress of the Human Genome Project, including the ethical and legal considerations raised by its findings. Part III of this Note reviews existing state and federal legislation and administrative regulations to examine their sufficiency in providing guidelines for the use of genetic information in the workplace. Using existing anti-discriminatory statutes, regulations, and judicial decisions, Part IV of the Note analyzes the "Cassandra Complex," an employer's liability for either using or ignoring available genetic information. Finally, Part V presents recommendations to the employer on preparing for the advent of the genetic workplace.

II. HISTORICAL BACKGROUND

A. The Eugenic Movement: The Quest for the "Perfect Person"

The quest for the perfect person found its political expression in the Eugenic Movement, which swept across the United States in the late nineteenth and early twentieth centuries. Developed as a theory in 1883, "eugenics" is described as the science of improving the human race by the careful selection of parents. French scientist Sir Francis Galton, a cousin of Charles Darwin, expounded the first theories of modern eugenics in the late 1800s. Creating the term eugenics from the Greek root meaning "well born," Galton maintained that "afflictions [such] as mental retardation, mental illness and criminality were incurable hereditary defects, and that measures preventing reproduction by those with such undesirable characteristics would eliminate many social problems." By the turn of the century, Galton's ideas on individual heredity had been expanded by his colleagues to include the concept that each

4. See Eric M. Jaegers, Note, Modern Judicial Treatment of Procreative Rights of Developmentally Disabled Persons: Equal Rights to Procreation and Sterilization, 31 U. LOUISVILLE J. FAM. L. 947, 950 (1993); see also George P. Smith, II, Genetics, Eugenics, and Public Policy, 1985 S. ILL. U. L.J. 435, 437 (1985) (defining "eugenics" as an "approach designed to give the more suitable races or strains of blood a better chance of prevailing speedily over the less suitable than they otherwise would have had") (quoting Comment, Eugenic Artificial Insemination: A Cure for Mediocrity?, 94 HARV. L. REV. 1850, 1852 (1981)).
6. See Jaegers, supra note 4, at 950.
7. Id.
individual's germ cells were ""part of a continuous stream of germplasm which has been in existence ever since the appearance of life on the globe, and which is destined to continue in existence as long as life remains on the globe.""8 In this expansive context, the concern of geneticists shifted from the individual's genetic traits to the "pools" of traits specific to race, nationality, or economic position.9 In the early part of the twentieth century, Galton's theories took root and flourished in a number of countries including the United States, England, and Germany.10

In the United States, the political unrest and economic change of the 1870s and 1880s, as well as the xenophobic sentiment that followed World War I, produced fertile ground for the growth of the Eugenic Movement in early 1900s.11 Eugenicists, supported by "scientific" evidence that intelligence and personality traits were genetically inheritable,12 maintained that society could actively improve itself by discouraging the reproductive capacity of its undesirable members and by encouraging reproduction of the desirable ones.13 Individuals considered unfit because of criminal backgrounds, low intelligence, or abuse of alcohol or drugs were targeted for negative eugenics—the effort "to eradicate the socially inadequate germplasm from the American stock."14 Ultimately, the "unfit" label expanded to include individuals with physical deformities, diseases such as epilepsy, syphilis, tuberculosis, or leprosy, and people of poor economic means.15

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9. See id. at 1421.
10. See Daniel J. Kevles, Eugenics and the Human Genome Project: Is the Past Prologue?, in JUSTICE AND THE HUMAN GENOME PROJECT 14, 15 (Timothy F. Murphy & Marc A. Lappé eds., 1994). Spurred by their American counterparts, German scientists, funded by the Nazi government, conducted substantial research into genetics. See Proctor, supra note 5, at 59-61. Racial hygiene, the care for germinal health, was pronounced a primary medical responsibility. See id. In Germany, as in the United States, eugenic policies were first implemented by forced sterilizations. See id.
11. See Cynkar, supra note 8, at 1423.
12. As their scientific basis, eugenicists used the work of Gregor Mendel, who developed genetic ratios through his experiments with crossbreeding peas. See id. at 1421. At a time when knowledge of genetics was in its infancy, eugenicists used these ratios to support their theories of the inheritability of individual characteristics and psychological traits. See id.
13. See Jaegers, supra note 4, at 950; see also Jana Leslie-Miller, From Bell to Bell: Responsible Reproduction in the Twentieth Century, 8 MD. J. CONTEMP. LEGAL ISSUES 123, 124 (1997) (commenting that the science of eugenics "justified discrimination on the basis of race, class, and sex").
14. Cynkar, supra note 8, at 1428.
15. See James E. Bowman, Genetics and African Americans, 27 SETON HALL L. REV. 919, 922 (1997). Immigrants from "undesirable racial stocks," such as the early twentieth century...

http://scholarlycommons.law.hofstra.edu/hlr/vol27/iss2/5
The negative eugenic policies demanded that those with inferior germplasm be rendered incapable of producing offspring to ensure that their deleterious genes would not have an opportunity to further "infect" society.\textsuperscript{16} To implement these policies, eugenicists proposed the establishment of a nationwide plan of mandatory, long-term care in custodial institutions for the genetically unfit. The advent in the 1890s of the salpingectomy and the vasectomy, relatively simple procedures to prevent reproduction, allowed eugenicists to advocate sterilization as a "more humane" method of accomplishing the eugenic goals.\textsuperscript{17}

The Eugenic Movement found legislative expression in the enactment of state sterilization laws. Starting with Indiana in 1907, thirty states passed compulsory sterilization laws by 1940, resulting in approximately 50,000 procedures by the end of World War II.\textsuperscript{18} Sterilization laws were upheld by the Supreme Court in 1927 in the landmark
case of *Buck v. Bell*, the Court’s first consideration of the constitutionality of state sterilization statutes. The reluctant plaintiff was Carrie Buck, a seventeen-year-old girl from Appalachia “who had a funny drawl and who perpetrated the sin of having a child out of wedlock.” The Supreme Court upheld the Virginia sterilization law as a valid exercise of state police power. The distinguishing feature of the case was Justice Holmes’ positive endorsement of eugenic theories, according more weight to the rights of society as a whole than to Buck’s individual procreative rights under the Fourteenth Amendment. Justice Holmes concluded: “It is better for all the world, if instead of waiting to execute degenerate offspring for crime, or to let them starve for their imbecility, society can prevent those who are manifestly unfit from continuing their kind. . . . Three generations of imbeciles are enough.”

Beginning in the 1930s, there was a gradual decline of support for eugenic theories. Increased scientific understanding of mental retardation disproved the theoretical foundations of eugenics by proposing that the majority of mental illness is not inheritable. Secondly, the outcome of the Nazi eugenic movement—the atrocities promoted by Adolf Hit-

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20. Leslie-Miller, *supra* note 13, at 128. Buck was committed to the State Colony for Epileptics and Feebleminded in Lynchburg, Virginia by her guardian, Mrs. Dobbs, who, upon discovering that Buck was pregnant, determined that the institution would be best able to handle her “unmanageable and promiscuous” behavior. See Cynkar, *supra* note 8, at 1437; see also Dudziak, *supra* note 17, at 848 (finding that the State of Virginia sought to prevent “propagation” by people it felt “mentally defective and socially inadequate”). Buck, like her mother who was institutionalized in the same colony, was classified as hereditarily feebleminded and was determined to have passed on her genetic disorder to her illegitimate offspring. The lower court found that Buck was the “probable potential parent of socially inadequate offspring,” and that she could be “sterilized without detriment to her general health.” Leslie-Miller, *supra* note 13, at 128. This conclusory statement was based on evidence such as Buck’s IQ score on the Binet-Simon intelligence test, her pregnancy, and hearsay from institution staff members. See id. Subsequent history proved that both Buck and her mother were of average intelligence, and that her daughter was a second grade honor roll student before dying at the age of eight. See Jaegers, *supra* note 4, at 957.
22. See Leslie-Miller, *supra* note 13, at 129.
23. *Buck*, 274 U.S. at 207. Justice Holmes, a social Darwinist at heart, was a believer in the possibility for science to breed a better race of human beings. This belief, in conjunction with his view that state legislatures and Congress should be left free to conduct social experimentation, combined to create his strong rhetoric in *Buck v. Bell*. See Dudziak, *supra* note 17, at 856. In his short opinion, Justice Holmes saw fit to cite only one case and saw no need to carefully ponder the constitutional arguments. See id. at 858. He subsequently declared that the *Buck* decision was “[o]ne decision that I wrote [that] gave me pleasure.” Id. at 859; see also Cynkar, *supra* note 8, at 1443-45 (discussing Justice Holmes’ opinion in *Buck v. Bell*).
25. See id. at 955.
THE CASSANDRA COMPLEX

Finally, procreative autonomy began to emerge as a fundamental right. Although not explicitly overruling *Buck v. Bell*, the Supreme Court in 1941 articulated its opposition to involuntary sterilization in *Skinner v. Oklahoma*, declaring that the state’s unequal application of sterilization in the criminal context was a constitutional violation and holding that procreation is a fundamental right.

B. Eugenics in the United States Workplace: The Quest for the “Perfect Worker”

The quest for the perfect person, dismissed by American society in the 1940s, found new expression in the quest for the perfect worker in the decades following World War II. Technological advancements in the post-war industrial explosion, especially the introduction of many new chemicals in the workplace reignited the interest in eugenics. However, this time the interest centered on identifying workers whose genetic makeup would be best suited to withstand increased exposure to industrial toxins.

After World War II, several large employers established medical screening programs to identify employees whose genetic makeup might render them “hyper-susceptible” to workplace toxins. These early industrial eugenic experiments would prove to be as misguided as the social eugenic policies of prior decades. Under the guise of extending workplace protection, these policies openly discriminated against workers with little valid scientific support and with even less consideration for the potential detrimental impact upon the lives of the individuals tested.

26. See id.
27. See id. at 957.
28. 316 U.S. 535 (1942). This Supreme Court case challenged the constitutionality of Oklahoma’s Habitual Criminal Sterilization Act requiring compulsory sterilization of individuals convicted of two or more felonies involving “moral turpitude.” See id. at 536. Disputing the contention that criminal tendencies are heritable, the Court concluded that the statute violated “the most elementary notions of due process.” Id. at 545.
29. See id. at 541.
30. Genetic testing in industry takes two forms: genetic screening and genetic monitoring, or cytogenetics. See OFFICE OF TECH. ASsESsMENT, U.S. CONGRESS, GENETIC MONrrORING AND SCREENING IN THE WORKPLACE 1 (1990) [hereinafter GENETIC MoNrrORING AND SCREENING]. Genetic monitoring involves periodic exams of current employees to evaluate modifications in their genetic material, such as chromosomal damage or molecular mutation, which occur in the course of their employment. See id. Genetic monitoring targets the entire active workforce and its focus is the identification of environmental workplace risks that can be reduced through the implementation of prevention programs. See id. at 2. Genetic screening, on the other hand, involves
Discriminatory treatment of workers on the basis of the results of sickle cell screening and enzyme testing illustrates both the dangers inherent in stereotyping workers without valid medical or scientific justification and the potential liability for employers in either accessing or ignoring the results of genetic tests. An examination of the ethical and legal problems that arose with these exclusionary policies serves as a preview of the potential problems that may face an employer when genetic testing becomes readily available.

1. Sickle Cell Screening

As early eugenicists postulated, many genetic traits are prevalent in specific races and nationalities, making genetic exclusionary policies particularly stigmatizing to certain segments of society. Sickle cell anemia is an inherited blood disorder in which red blood cells become sickled, or crescent shaped, causing physical symptoms of varying severity. The disease manifests itself in homozygous individuals, those who have inherited the sickle cell gene from both parents. Heterozygous individuals, those who have inherited one normal hemoglobin gene and one sickle cell gene, test positive for the disease trait but effectively have no adverse physical manifestations. The sickle cell trait is concentrated in people of African ancestry and, to a lesser degree, those of Middle Eastern or Mediterranean ancestry.

Interest in screening for sickle cell anemia increased after the deaths of four black Army recruits while training at moderately high
altitudes at Fort Bliss, Texas.\textsuperscript{36} With little scientific corroboration, the Air Force Academy imposed an entrance ban on carriers of the sickle cell gene, regardless of whether they showed evidence of the disease.\textsuperscript{37} In addition, the Department of Defense initiated a policy of excluding sickle cell carriers from aviation and flight crew training.\textsuperscript{38} Following the Air Force's lead, Congress passed the National Sickle Cell Anemia Control Act of 1972,\textsuperscript{39} which appropriated federal funds for voluntary testing programs to detect the sickle cell gene in the black population.\textsuperscript{40} The government, like the armed forces, ignored the critical difference between the sickle cell \textit{trait} carried by healthy heterozygous individuals and the sickle cell \textit{disease}, thereby perpetuating the stigmatization of over two million blacks.\textsuperscript{41}

Industry soon reacted to the government's concern, suspecting that healthy carriers of the sickle cell gene might prove more vulnerable, or hyper-susceptible, to hemolytic agents such as amino and nitro compounds, benzene, cadmium, carbon monoxide, and cyanide.\textsuperscript{42} In a three month study of genetics in the workplace, the \textit{New York Times} reported that Du Pont de Nemours & Co. ("Du Pont") had routinely given pre-employment blood tests to black applicants to identify carriers of the sickle cell gene.\textsuperscript{43} Dr. Charles F. Reinhardt, Director of Du Pont's Haskell Lab for Toxicology and Industrial Medicine, told the \textit{Times} that the tests were started in 1972 at the request of a group of black employees.\textsuperscript{44} Dr. Bruce W. Karrh, the Medical Director for Du Pont, maintained that no job placement decisions had been made on the basis of the tests.\textsuperscript{45}

Subsequently, in the 1981 congressional hearings investigating the existence of genetic screening in the workplace, Dr. Karrh testified that the testing program had been publicly misconstrued.\textsuperscript{46} He reaffirmed that the screening of black employees and applicants was purely for

\begin{footnotes}
36. See Proctor, \textit{supra} note 5, at 72.
37. See \textit{id}.
38. See \textit{id}.
40. See Bowman, \textit{supra} note 15, at 920.
41. See \textit{id}.
42. See Brokaw, \textit{supra} note 35, at 323.
44. See \textit{id}.
45. See \textit{id}.
46. See Genetic Screening and the Handling of High-Risk Groups in the Workplace: Hearings Before the Subcomm. on Investigations and Oversight of the House Comm. on Science and Tech., 97th Cong. 261 (1981) [hereinafter \textit{High-Risk Groups}].
\end{footnotes}
their information and benefit and that no decisions had been made regarding placement or promotion as a result of the tests. These reassuring statements contradicted prior admissions by Dr. Reinhardt in the New York Times article that “the tests would definitely influence the employment process.”

Both Dr. Karrh and Dr. Reinhardt were unable to testify as to how many blacks applicant had been screened since the program had been initiated in 1972 or how many instances of sickle cell had been found. Both maintained that no systematized data had been derived from the tests. After numerous interviews with company officials, the New York Times concluded that “it remains difficult to determine precisely what is happening with genetic screening at Du Pont.”

The Du Pont officials did seem to agree on one fact. Despite their concern for the health of their employees, no thought had been given to genetic testing of white workers of Mediterranean ancestry susceptible to inheritable blood diseases. To explain this inconsistency, Dr. Karrh stated in congressional hearings that the tests were limited to blacks because “the original request came from them.” However, he confirmed that many of Du Pont’s sites continued testing black applicants, and that determination of who was black and would therefore be tested was done “by appearance.” Moreover, even though the tests were ostensibly conducted for the employee’s personal use, Dr. Karrh said that employee’s medical records were retained in the company medical files, accessible on a “need-to-know” basis. Also at the 1981 hearings, Dr. Barton Childs, a professor at the Johns Hopkins Medical School, testified that he could see no reason for the Du Pont screening program, but affirmed that this screening effectively stigmatized healthy individuals and exposed them to discrimination in employment and in health insurance.

2. Enzyme Testing

In addition to screening black applicants for the sickle cell trait, Du Pont tested applicants for two enzyme deficiencies prevalent in specific

47. See id.
49. See id.
50. See id.
51. Id.
52. See id.
53. High-Risk Groups, supra note 46, at 282.
54. Id.
55. See id. at 283-84.
56. See id.
races and nationalities: Glucose-6-phosphate dehydrogenase ("G-6-PD") deficiency and Serum alpha subscript 1-antitrypsin ("SAT") deficiency. Glucose-6-phosphate dehydrogenase is a biochemical genetic condition involving red blood cells, which occurs homozygously in males and is found primarily in blacks from Central Africa, Mediterraneans, Asians, East Indians, Filipinos, and Oceanians. A deficiency of the enzyme interferes with the oxidation of glucose and was believed to endanger individuals exposed to industrial amino and nitro compounds. However, no information or studies exist to back up the proposition that deficient individuals exhibit a heightened medical risk from exposure to industrial chemicals.

SAT deficiency, occurring most frequently among people of northern European ancestry, is responsible for a predisposition to alveolar destruction leading to chronic pulmonary disease. Smoking and exposure to dusty environments exacerbate the condition. As with the other genetic conditions, there is a significant difference in outcome between homozygous and heterozygous individuals, with only ten percent of SAT deficient heterozygotes ultimately developing the disease.

Dr. Karrh testified in the congressional hearings that Du Pont tested for the two enzyme deficiencies on a limited basis to determine if the tests would be of value in protecting the health of susceptible employees. He concluded that the tests were generally found not to be useful in an occupational setting. In his testimony, Dr. Karrh stated that he could not answer the question as to whether employees and applicants were notified prior to testing, and he affirmed that there were no counseling or educational programs available for those workers found to test positive for the deficiencies.

Dr. Karrh nevertheless admitted that the results of tests for G-6-PD deficiency had been used to reassign four employees from positions that

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57. See id. at 284.
58. See Rothstein, supra note 32, at 1386.
59. See id. at 1390.
60. See id. at 1385.
61. See id. at 1386.
62. See id. at 1390-91.
63. See id. at 1387.
64. See id.
65. See id.
66. See High-Risk Groups, supra note 46, at 266.
67. See id.
68. See id. at 284.
69. See id. at 285.
had potential exposure to amino compounds. He reassured the congressmen that upon discovery of this practice, the plant physician was advised that tests should not be used as the sole criteria for placement decisions. As with sickle cell testing, the results of the enzyme deficiency tests were filed with the medical records of the employee. Dr. Karrh did not elaborate as to the planned use for these findings nor what workplace decisions they would engender. Commenting on Du Pont’s screening policies, Dr. Jonathan King, molecular biologist at the Massachusetts Institute of Technology, maintained that:

“This policy of Du Pont’s is very clearly a eugenic policy . . . . Du Pont’s position is scientific racism. They say they are not bigots because all this is based on science. But the fact is that people are not going to get sick because they are hypersusceptible, they are going to get sick because they are being poisoned.”

The New York Times investigative study uncovered another company that had been testing thousands of workers to determine if “defective” genes were making them more vulnerable to substances in the workplace. Ironically, in this report, the employer, the Dow Chemical Company (“Dow”), was equally censured, but in this case for its failure to act on the basis of the test results. Under the guidance of Medical Director Jack Killian, Dow began conducting genetic monitoring on its workers to detect change in chromosomal structure due to exposure to workplace substances. By the mid-1970s, Dr. Killian became convinced that workers who exhibited consistently high rates of broken chromosomes should be notified and transferred away from the chemicals that might be the cause of their chromosomal mutations. According to Dr. Killian, when he and his colleagues determined that the chromosomal breakage centered on workers exposed to benzene and epichlorohydrin, Dow officials grew distant, hostile, and defensive about the findings. Dr. Killian eventually left Dow, along with the key

70. See id.
71. See id.
72. See id. at 283-84.
73. See id. at 283-87.
76. See id.
77. See id.
78. See id.
79. See id.
people who contributed to the study.\textsuperscript{80}

Dow, like Du Pont, maintained that after more than a decade and a half of genetic screening involving thousands of workers, it had no exact figure for how many workers were screened, what the tests concluded, or how the company might use genetic monitoring in the future.\textsuperscript{81} Dow's explanation for its failure to act on Dr. Killian's data was that his results were difficult to evaluate and that it would be irresponsible to alarm workers by citing findings that might prove to be inaccurate.\textsuperscript{82} The Dow experiment, although initially established for outwardly beneficial reasons such as the protection of industrial workers, was eventually condemned because of the company's failure to act on the results of the test.

The two corporations, Dow and Du Pont serve as early examples of employers confronted with the Cassandra Complex. Lacking clear legal and ethical guidance, they were both censured, one for acting and one for failing to act on the results of predictive employee testing.\textsuperscript{83}

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\textsuperscript{80} See id. Dr. Dante Picciano, the geneticist who worked under Dr. Killian, had a similar problem in convincing Dow Chemical Company ("Dow") officials that the genetic results were significant enough to necessitate corporate action. See id. He, like Dr. Killian, eventually left Dow. See id.


\textsuperscript{82} See id.

\textsuperscript{83} Not all exclusionary practices were based on medical testing. Some were enacted simply on the basis of a worker's sex and misconceptions as to its limitations. These practices, like the broad exclusions of healthy heterozygous individuals, were based on groundless generalizations of a group's physical limitations. In January 1980, 13 female employees of the American Cyanamid Company ("American"), along with their labor union, brought a sexual discrimination suit against the company under Title VII of the Civil Rights Act of 1964. See \textit{High-Risk Groups}, supra note 46, at 172. The plaintiffs maintained that American fostered a policy barring all women except those whose infertility was medically documented from certain jobs involving exposure to lead. See id. Five of the women had undergone voluntary sterilization in order to keep their positions. See id. A year prior to the suit, the Occupational Safety and Health Administration ("OSHA") had charged American with a violation of OSHA's regulatory standards and had fined the company $10,000 for its sex-based exclusionary policies. See Oil, Chem. & Atomic Workers Int'l Union v. American Cyanamid Co., 741 F.2d 444, 450 n.1 (D.C. Cir. 1984). OSHA settled the suit. See id. OSHA's Lead Standard rejected the absolute exclusion of fertile women, requiring instead that testing and transfers apply equally to men and women planning to parent children. See \textit{High-Risk Groups}, supra note 46, at 188-89. The issue of gender-biased policies was addressed by the Supreme Court in the landmark case of \textit{International Union v. Johnson Controls, Inc.}, 499 U.S. 187 (1991). The action was brought by women workers who had chosen to be sterilized to avoid losing their jobs. See id. at 192. Johnson Controls' policy, like American's, excluded women from the battery manufacturing process where the primary ingredient was lead. See id. at 206. In holding the policy violative of women's rights under Title VII, the Court concluded that decisions regarding the welfare of future children should be left to parents rather than to employers. See id. Addressing the potential liability of the employer from suits by the offspring of exposed workers, the Court explained: "If, under general tort principles, Title VII bans sex-specific fetal-protection policies,
C. Congressional Interest in Genetic Monitoring and Screening

The newspaper reports exposing industrial experiments with genetic monitoring and screening finally reached the ears of Congress. Alarmed by the rising controversy, Congress commissioned the Office of Technology Assessment ("OTA") to conduct a survey on genetic monitoring and screening in the workplace. The national survey targeted the 500 largest United States industries (Fortune 500), the fifty largest utility companies, and thirty-three major unions. Much to the government's surprise, the 1982 survey documented that six companies were actually conducting genetic monitoring and screening, and that fifty-five companies indicated they would "possibly" use genetic tests within the next five year period. Albert Gore, Chairman of the Subcommittee on Investigations and Oversight of the Committee on Science and Technology ("Subcommittee"), commented that "instead of putting a controversy to rest, the OTA study gives further evidence of the need to examine in much more detail the development of cytogenetic screening as well as its ramifications."

On the same day that the New York Times released the results of the OTA's controversial survey, Representative Gore convened a hearing before the Subcommittee to discuss the survey findings and their ethical and legal implications for industry. After analyzing the results of the survey, the Subcommittee heard various experts voice their concerns over the developing trend of genetic screening and monitoring in the workplace. Dr. Gretchen Kolsrud of the OTA testified in part that the problems were arising due to the rapid development of genetic technologies. She stated that "[w]e have no ethical guidelines to tell us how or whether to use these capabilities because we have not had to face the questions that are being posed by the potential of these new technolo-

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84. See GENETIC MONITORING AND SCREENING, supra note 30, at 18.
85. See id.
86. See id. at 21-22; see also Genetic Screening of Workers: Hearing Before the Subcomm. on Investigations and Oversight of the House Comm. on Science and Tech., 97th Cong. 2 (1982) [hereinafter Genetic Screening of Workers] (finding that "a handful of companies are currently using these methods and a more appreciable number intend to implement these practices in the next 5 years").
87. Genetic Screening of Workers, supra note 86, at 2.
89. See Genetic Screening of Workers, supra note 86, at 1-2.
90. See id. at 44.
Dr. Kenneth B. Miller, Medical Director for the Workers' Institute for Safety and Health, stated that accepted guidelines for medical screening stressed "the need for a demonstrated benefit to the individual with little potential for harm." He added that in order for early intervention and treatment to be effective, there must be both "a clear definition of what the disease state is and [knowledge of] the natural progression of the disease." Dr. Miller concluded that in the case of genetic screening, where there is no known disease and no predictable progression from chromosomal differences to disease, the potential harm to the individual might outweigh the hypothetical benefit. Dr. Miller predicted that, by labeling individuals as "hyper-susceptible," employers could shift the responsibility for workplace safety to the genetics of the worker. This shift would deflect "the attention that might be paid to the employer's inability or unwillingness to make the workplace safe for all those who trust that their health will be protected on the job." Mark Rothstein, Professor at the College of Law, West Virginia University and an expert on the ethical ramifications of genetic screening, also testified before the subcommittee. He anticipated that with the advent of genetic screening, the potential workforce would become divided into two groups. He explained that "[o]ne group would contain super healthy, disease-resistant persons; a second group would contain able-bodied persons who are unemployable because of an atypical hereditary trait or a chromosomal anomaly that places them in a category of statistically higher risk of occupational illness." Representative Gore observed that genetic surveillance was "akin to a black art and that it is really very tentative and premature. Nevertheless, companies are rushing headlong into this technique, or apparently many of them are ready to move quickly into this area."

In 1989, the OTA conducted a second survey, designed to remove ambiguities that might have been present in the initial survey and to provide trend data for the seven years that elapsed since the 1982 survey. Of the 330 Fortune companies responding to the 1989 survey,
twelve health officers reported that their companies were currently conducting genetic monitoring or screening, as compared with six reporting such use in 1982. Substantiating the *New York Times* reports, the survey found that twenty-seven percent of health officers in the 1989 survey reported "the existence of medical criteria that affected employment eligibility of job applicants. These included back ailments or problems, pregnancy, sensitivity to materials used in production, and respiratory conditions." Ultimately, with an almost audible sigh of relief, the OTA concluded that the 1989 survey appeared to indicate that there was no evidence of a sizeable increase in the number of companies using genetic screening or monitoring, and that fewer companies appeared to anticipate using it in the future.

In the same year that the second survey was conducted, the United States government publicly launched the Human Genome Project, the largest, most ambitious experiment in human genetics to have ever been conducted.

**III. THE HUMAN GENOME PROJECT**

**A. Origins**

As ethical debates raged on Capitol Hill, the seed for the ambitious Human Genome Project was planted in the arid soil of Santa Cruz, New Mexico. In May 1985, Robert Sinsheimer, who was then the chancellor

[100] *See id.* In the 1989 survey, 20 health officers stated that their companies had conducted genetic screening or monitoring either currently or in the past, whereas 18 officers reported such current or past use in the 1982 survey. *See id.*

[101] *Id.* at 4. Of particular concern in the 1989 study was the question of what pre-employment examinations would be considered acceptable. *See id.* at 4-7. Most health and personnel officers responded affirmatively to the use of examinations to identify employees who were physically unfit for employment; currently using drugs; at increased risk to workplace hazards or emotionally or psychologically unstable. *See id.* The use of testing to identify high insurance risks was found to be acceptable by a smaller proportion of health and personnel officers. *See id.* Almost universally, corporate personnel officers thought periodic medical testing of employees in workplace settings where there were known health risks was appropriate. *See id.* In voicing their concerns for future genetic testing in the workplace, the respondents reported cost-effectiveness, reliability, and legality as primary considerations. *See id.* Over half of the health officers responding to the survey agreed with the idea that genetic testing represented a potential threat to the rights of the employee. *See id.* Interestingly, those companies reporting current genetic testing were most likely to agree with this idea. *See id.* The growing concern of employers over the rising cost of health insurance featured prominently in their responses. *See id.* More than a third of the respondents answered that an applicant's health insurance risk was assessed when considering his or her candidacy for a position with the company.

[102] *See GENETIC MONITORING AND SCREENING*, *supra* note 30, at 21-22.
of the University of California at Santa Cruz, gathered an assorted mix of deoxyribonucleic acid ("DNA") experts to discuss the feasibility of mapping and sequencing the entire human genome. In the same year, Charles DeLisi, who had proposed an independent Human Genome Initiative to the Department of Energy ("DOE"), became the Director of the DOE's Office of Health and Environmental Research. After a 1986 meeting in Santa Fe, New Mexico, DeLisi proposed that certain national laboratories should become the center of the United States', and perhaps the world's, human genome efforts. Funding for DeLisi's proposals began in fiscal year 1987, commanding an initial budget of $4.2 million.

In addition to the DOE, several other governmental agencies and private institutions had launched corresponding programs with ambitious goals and sizeable budgets. The National Institutes of Health ("NIH") held a meeting in October 1986 to set policy for the NIH's 3000 projects (with a combined budget of $294 million) involving genetic mapping and sequencing. The National Science Foundation, the
Howard Hughes Medical Institute, and the National Research Council ("NRC") also committed substantial funding to research related to mapping and sequencing the human genome.\textsuperscript{100}

In light of these potentially conflicting projects, the Board of Basic Biology, Commission on Life Sciences of the National Academy of Sciences held a meeting in August 1986 and decided to commission a special NRC committee to prepare a report as to how the United States should proceed with the Human Genome Project.\textsuperscript{100} The committee's report urged the United States government to begin a unified Human Genome Project and to cooperate with other interested nations.\textsuperscript{100} The committee proposed a fifteen-year project, with an estimated budget of $200 million per year.\textsuperscript{111} At the same time, the House Committee on Energy and Commerce commissioned the OTA to prepare a report assessing the scientific and medical validity of the genome projects.\textsuperscript{112} The OTA's final report, published in April 1988, sounded a cautionary note regarding the possible ethical and legal implications of the genome projects.\textsuperscript{113} The OTA concluded that the question of whether the United States should enter the genetic arena was moot, since mapping and sequencing activities had been ongoing for a decade with no governmental prohibition.\textsuperscript{114} The report recommended that the federal government become involved in genome research in the public interest of "making resources available in ways that are consistent with the considerations of

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\textsuperscript{100} See id. at 93. Its projects involving genetic mapping and sequencing commanded a combined budget of $294 million. See id.

\textsuperscript{101} See id. at 102-07. The National Science Foundation, commissioned to continue the federal government's role in sponsoring basic research, had spent, in 1987, an estimated $32.7 million in research related to genetic sequencing and mapping. See id. In 1987, the Howard Hughes Medical Institute, a privately endowed organization, had committed an estimated $40 million to genetic research, and the National Research Council, a federal agency providing the government with advice regarding scientific issues, had recommended $200 million per year for a three year research project on the genome. See id.

\textsuperscript{102} See Watson, supra note 103, at 45.

\textsuperscript{111} See Watson, supra note 103, at 45.

\textsuperscript{113} See How Big, How Fast?, supra note 106, at 79.

\textsuperscript{114} See id. at 80-81.
beneficence, justice, and autonomy.”

The OTA stressed that the government’s involvement was needed to ensure centralized control of the evolving technological applications of the genome project so that ethical issues, such as voluntary testing and the access of data, could be addressed, regulated, and controlled by federal legislation. In considering the ethical implications of the genome initiative, the report warned that “[t]hese questions are complex and are not likely to be resolved in the near future. It will therefore be necessary to ensure that some means for explicitly addressing ethical issues attends scientific work.” The report concluded with the recommendation that the mapping and sequencing efforts continue to evolve as a multi-agency effort, but that Congress regulate the level of involvement and control accorded to the participants.

Congress assessed the need for centralized governmental involvement in the genome initiatives as early as January 1987. The Biotechnology Competitiveness Act of 1987 addressed the need for a federal policy coordinating biotechnical efforts, particularly encouraging the cooperation and communication between the research community, government, and industry. Responding to perceived ethical and safety concerns, the proponents of the bill recommended the establishment of a Biomedical Ethics Board, an independent entity in the executive branch which would include representatives from all of the federal agencies funding biotechnology-related regulation, research, or promotion. The bill additionally proposed the establishment of the National Advisory Panel on the Human Genome, co-chaired by the NIH and DOE officials to recommend the best strategy for the genome project, including the evaluation of ethical considerations raised by genetic research and prod-

115. Id. at 87.
116. See id.
117. Id. at 88.
118. See id. at 110.
120. “A bill to amend the Public Health Service Act to improve information and research on biotechnology and the human genome, and for other purposes . . . .” 133 Cong. Rec. S18,399 (daily ed. Dec. 18, 1987).
121. See id. at S18,399 (statement of Sen. Chiles).
122. See id. at S18,400.
uct development. To ensure the bill's passage, its proponents raised the specter of the potential for destructive or unethical uses of the new genetic information if governmental controls were not imposed, as well as the overriding need to "keep the U.S. biotechnology industry the best in the world."\textsuperscript{124}

In fiscal year 1988, the DOE was awarded $12 million of its $15 million budget request to continue its genome effort. An additional $18 million was subsequently awarded to the National Institutes of General Medical Sciences ("NIGMS"), the NIH's genome research division.\textsuperscript{125} With these appropriations, Congress sent a clear message that both the DOE and the NIH would be responsible for the development of a united Human Genome Project.\textsuperscript{126}

\textbf{B. Project Planning and Organization}

Faced with the reality of having to cooperate in order to obtain continued federal funding for their genome initiatives, the DOE and the NIH signed a Memorandum of Understanding in 1988 and appointed a joint advisory group to outline the strategy of the unified Human Genome Project. In April of 1990, the joint advisory group of the NIH's National Center for Human Genome Research ("NCHGR") and DOE's Office of Health and Environmental Research ("OHER") published a comprehensive plan outlining the mission and organization of the first five years of the Human Genome Project.\textsuperscript{127}

\begin{flushright}
\textsuperscript{123.} \textit{See id.}

\textsuperscript{124.} \textit{Id.} at S18,405. To underscore this latter goal, the proponents introduced articles reporting advances in biotechnology by the Japanese, which threatened to topple the United States as the leading biotechnological giant. \textit{See id.} at S18,402-03. Expounding on Japan's commitment of funds to biotechnology, the article warned of Japan's capacity for dominating biotechnology in the same manner that it had previously dominated the electronic and automotive fields. \textit{See id.}

\textsuperscript{125.} \textit{See Watson, supra} note 103, at 45-46.

\textsuperscript{126.} In hearings before the Senate Committee on Labor and Human Resources in July 1996, Senator Domenici reflected on the origins of the collaboration between the NIH and the DOE in the Human Genome Project. He stated:

I can remember vividly 10 years ago that we got this [Genome Project] started by creating, believe it or not, a competition between the Department of Energy and the NIH. The NIH was kind of worried about whether they should do [the Project], and I said, well, fine, if they will not, let us have the Department of Energy do it, since they had been doing a lot of genetic work because of Hiroshima and Nagasaki. And, believe it or not, the enthusiasm of the NIH changed in a positive and exponential manner once I introduced the bill to give the Genome Project to the Department of Energy. \textit{Advances in Genetics Research and Technologies: Challenges for Public Policy, 104th Cong. 2 (1996)} [hereinafter \textit{Advances in Genetics Research}].

\textsuperscript{127.} \textit{See The First Five Years, supra} note 103. Although the two agencies found themselves united in the new partnership, their individual interests in the Human Genome Project were
The 1990 joint NIH and DOE plan articulated the overall goal of the Human Genome Project: "to acquire fundamental information needed to further our basic scientific understanding of human genetics and of the role of various genes in health and disease." Two of the specific goals for the period from 1990 to 1995 were: (1) the production of a variety of physical maps of all human chromosomes and of those of selected model organisms and (2) the determination of the completed sequence of human DNA and the DNA of the model organisms. The program was expected to take fifteen years to complete, with an estimated expenditure of $3 billion. To address ethical and legal issues, the agencies proposed a NIH and DOE joint working group on Ethical, Legal, and Social Implications ("ELSI") to anticipate and address the implications for individuals and society of mapping and sequencing the human genome. The ELSI group's initial emphasis was on the "privacy of genetic information, safe and effective introduction of genetic information in the clinical setting, fairness in the use of genetic in-
formation, and professional and public education." Three percent of the overall Human Genome project budget was made available for the activities of the ELSI.

C. Project Progress

By fiscal year 1990, the Human Genome Project had grown from a $17.2 million program to one commanding a budget of $59.5 million. With the increase in funding came increased concern with the application of the discoveries rapidly being made by the initiative. In hearings before the House of Representatives on March 19, 1991, Representative Michael Andrews of Texas (D-TX), quoting George Bernard Shaw, stated that "'[s]cience is always wrong. It never solves a problem without creating 10 more.'" He expressed a concern that with easy access to a person's genetic profile, there would be a heightened potential for unfair denial of benefits and jobs. He urged Congress to enact laws that would prevent discrimination based on genetic profiles while maintaining that "[t]he promise of the human genome project should be enough to move us forward as fast as possible."

The progress of the Human Genome Project continued in relative obscurity through the next six years, with modest increases in funding.
The Human Genome Project was given a sizeable boost on May 21, 1997, when the Senate passed the Mack-Feinstein Amendment, doubling the investment in biomedical research at the NIH by 2002 and renewing Congress’ interest in the project. In his congressional testimony on September 30, 1997, Dr. Collins stated that although only two percent of the human genome had been sequenced, projects initiated in 1996 would generate between 50 and 100 million base pairs of human DNA sequence by 1998, leading to a total sequence of the genome by 2005.

Dr. Francis Collins, Director of the NIH’s National Human Genome Research Institute (“NHGRI”), further testified that as a result of the Human Genome Project, new disease genes were discovered almost weekly, with recent identification of the sequences of genes involved in the onset of colon cancer, diabetes, breast cancer, and Alzheimer’s disease. He added that ELSI’s major focus in 1997 was to ensure the responsible use of genetic information, since the rapid increase in the number of genetic tests available to the individual greatly increases the potential for misinterpretation and abuse.

The achievements of the Human Genome Project, in conjunction with international genome initiatives and with private biotechnology corporations, continue on a daily basis. The discoveries made by the initiatives have contributed to the identification of the genes associated with diseases such as Huntington’s disease, neurofibromatosis types 1 & 2, certain genetic types of breast and colon cancers, hypertension, diabetes, and Alzheimer’s disease. Progress in identifying genetic markers affecting predisposition to common ailments such as lower back injuries, allergies, and arthritis have been equally successful. Based on these findings, dozens of new biotechnology companies have sought to develop genetic tests for disorders ranging from arthritis to obesity.

On September 14, 1997, biologists at the NHGRI isolated the first gene that may affect social behavior in mammals, a discovery which prom-

141. See id.
142. See id.
143. See Postscript infra notes 361-81 and accompanying text.
144. See Collins & Galas, supra note 132, at 46.
146. See Casey, supra note 103, at 14.
ises to shed new light on disorders of human social behavior such as schizophrenia and autism.  

D. Progress in Ethical Considerations

From the discovery of the recombinant DNA technique in November 1974, which launched the age of genetic engineering to the scientific planning conferences in the 1980s, there seems to be little documentary evidence indicating that the scientists who proposed the Human Genome Project considered its ethical and legal implications. The reluctance by the scientific community to evaluate ethical problems squarely shifted to Congress the contradictory tasks of anticipating the societal repercussions caused by the access to genetic information and of continuing to champion expanding genetic projects.

Governmental concern for the ethical dilemmas associated with the Human Genome Project were voiced several years prior its launching. On January 26, 1987, the OTA sponsored a workshop entitled Issues of Collaboration for Human Genome Projects which convened in preparation for the OTA's final assessment report recommending federal control over the project. One of the speakers, Dr. Mark Lappé of the University of Illinois at Chicago College of Medicine, warned of the long-term ethical implications of mapping and sequencing the human genome. He urged that scientific professionals take immediate steps to insure that the results of the project be used for the benefit of society and to safeguard against the misuse of sensitive genetic data.


148. See Charles Weiner, Anticipating the Consequences of Genetic Engineering: Past, Present, and Future, in ARE GENES US? 31, 31 (Carl F. Cranor ed., 1994). Dr. Arthur Caplan, Director of the University of Pennsylvania's Center for Bioethics, suggested that this scientific reluctance to address ethical issues stems from an awareness by researchers that ethical concerns may stand in the way of continued funding for biotechnical projects. See Shenk, supra note 145, at 39-42.

149. One of the earliest expression of concern came from Senator Edward Kennedy in his address at the Harvard Medical School in May 1975:

"When science develops techniques that have the potential to fundamentally change society, society has the right to determine how the technique is to be used, whether it should be developed in the first place, and if so, under what constraints. A decision to pursue the kind of research discussed . . . requires the informed consent of the society—which, after all—is called upon to fund it."

Weiner, supra note 148, at 43.


151. See id. at 6.

152. See id. at 21.
viewing the eugenic experiments of the past, Dr. Lappé warned that, armed with the results from the Human Genome Project, eugenicists would, for the first time, be able to point to "hard" genetic data to attain their desired ends.\textsuperscript{155} He concluded that "[b]ecause of the intrinsic capacity of genomic information to be used to discriminate (both invidiously and acceptably) among members of the population and to affect their entitlements, it is also highly desirable that protections against significant abuse be in place \textit{before} the project gets underway.\textsuperscript{154}

The joint report from the NIH and the DOE, which outlined the first five years of the Human Genome Project, gave considerable attention to the report of the working group, ELSI, and to the ethical, social, and legal issues awaiting the dawn of the genetic era.\textsuperscript{155} The report stressed the need to protect individuals and society from the possible hazards resulting from the new methods for detecting and predicting hereditary illness.\textsuperscript{156} The report underscored that "[t]he use of genetic information, for good or ill, has long been an issue in our society. But the quantity and complexity of genetic information that should become available requires that special precautions be taken."\textsuperscript{157} In analyzing the potential discriminatory effects caused by the release of genetic information to employers and insurers, the report concluded that "[t]he interim phase, before adequate treatment is available, is the one in which the most deleterious consequences can occur, such as discrimination against gene carriers, loss of employment or insurance, stigmatization, untoward psychological reactions and attention."\textsuperscript{158} After outlining a plan for addressing these ethical dilemmas,\textsuperscript{159} the ELSI working group concluded that a critical ethical component for the first five years was informing the general public of the goals of the Human Genome Project and soliciting from them their questions and concerns.\textsuperscript{160}

\begin{itemize}
\item \textsuperscript{153.} See \textit{id.} at 44.
\item \textsuperscript{154.} \textit{id.} at 60 (emphasis added). For a more thorough discussion of the ethical challenges generated by the Human Genome Project, see \textit{JUSTICE AND THE HUMAN GENOME PROJECT}, \textit{supra} note 10.
\item \textsuperscript{155.} See \textit{THE FIRST FIVE YEARS}, \textit{supra} note 103, at 65-71.
\item \textsuperscript{156.} See \textit{id.} at 65.
\item \textsuperscript{157.} \textit{id.}
\item \textsuperscript{158.} \textit{id.}
\item \textsuperscript{159.} See \textit{id.} at 66-69.
\item \textsuperscript{160.} See \textit{id.} at 70. The relative anonymity of the Human Genome Project was commented on by the Director of NHGRI, who stated:

"If you ask the average person what the Human Genome Project is and what it will do, most people will say, Huh? But when the history of science is written 100 years from now, this will be seen as the greatest scientific project of the century, maybe of all time."
\end{itemize}
Seven years after its initial report, ELSI produced a final report in September 1997. Although the report's findings centered on the accuracy and confidentiality of genetic test results in laboratories and medical offices, the report echoed the themes of its 1990 plan. Strongly advocating informed consent wherever genetic specimens could be traced back to the subject, the ELSI working group stressed that "[u]nder no circumstances should results with identifiers be provided to any outside parties, including employers, insurers, or government agencies . . . [nor should any person] be subjected to unfair discrimination by a third party on the basis of having had a genetic test or receiving an abnormal genetic test result." In conceding that its prior mandate for universal education was more difficult than initially anticipated, the task force stated that "identifying a genetic variant that has a much higher frequency in some ethnic groups than in others could have a stigmatizing effect on that group." In April 1990, James D. Watson, co-discoverer of the structure of DNA and Director of the NCHGR in the infancy of the Human Genome Project, warned:

We must work to ensure that society learns to use the information only in beneficial ways and, if necessary, pass laws at both the federal and state levels to prevent invasions of privacy of an individual's genetic background by either employers, insurers, or government agencies and to prevent discrimination on genetic grounds. . . . We have only to look at how the Nazis used leading members of the German human genetics and psychiatry communities to justify their genocide programs . . . . We need no more vivid reminders that science in the wrong hands can do incalculable harm.


162. Id. at xiv.

163. Id. at 65; Charles W. Henderson, Breast Cancer Gene May Intensify Breast Cancer Growth, CANCER WKLY PLUS, Sept. 7, 1997. As progress in gene sequencing continues, scientists have continued to find genetic alterations that are prevalent in specific nationalities or races. See Rick Weiss, Jews Say Gene Find Medically, Culturally Troubling, DETROIT NEWS, Sept. 8, 1997, at 2E (documenting that these discoveries have further fueled fears of stigmatization based on genetic stereotype). The Johns Hopkins Medical Center recently discovered a tiny genetic variation found in one of every six Jews of Eastern European ancestry that doubles the odds of getting colon cancer. See id. This genetic discovery joins other diseases found in similarly isolated and genetically "intact" populations such as musculoskeletal disease (Amish), diabetes (Native American), sickle cell anemia (Blacks), and cystic fibrosis (Northern Europeans). See id.

164. Watson, supra note 103, at 46.
IV. LEGISLATIVE ACTION AND INACTION

To date, there has been no federal legislation enacted to guide employers or insurers in the ethical and legal use of genetic information. By the year 2005, the scheduled completion date of the Project, such information should be as readily accessible as the results of a routine blood test. As evidenced by the vast differences in interpretation between courts on issues related to workplace discrimination, it is clear that the establishment of uniform laws to regulate the collection, use, and retention of genetic information must come from the legislature. Without these statutes, the courts will be left to generate decisions in a highly technical area with minimal information or advice. Additionally, the successful resolution of the myriad of ethical and legal issues generated by the Human Genome Project will require compromise and deliberation, two qualities better embodied by the legislative rather than the judicial process. Congress, unlike the courts, has the power to delegate to an agency the authority to establish criteria and procedures to guide the employer through the evolving legal labyrinth of genetic information in the workplace.

In 1995, the ELSI component of the Human Genome Project issued a proposed model for federal legislation entitled The Genetic Privacy Act and Commentary. The main goal of the model act was to provide assurance that an individual’s genetic information would not be controlled or possessed by third parties unless consented to by the individual. The act proposes an express prohibition on the unauthorized collection and analysis of DNA information where the individual’s identity can be determined. However, the act does allow DNA collection for a number of specific purposes, including issues involving research activities, fetuses and pregnant women, and minors and incompetent people.

165. Ethical, Legal, and Social Implications, in conjunction with the Einstein Institute, initiated the Genetics Adjudication Research Project whose goal was to educate 1000 state and federal judges on genetics and molecular biology over a two year period. See Genetic Testing: Courts, Legislatures Ready for Flood of Genetics Related Cases and Bills, 5 Health L. Rep. (BNA) (Dec. 12, 1996), available in Westlaw, 5 B.H.L.R. 48. Franklin M. Zweig, President and Chief Executive Officer of the Einstein Institute, commented that the courts are going to have “one hell of a time” ruling on complaints involving genetic discrimination without a scientific background. See id.
167. See id. at 203.
169. See id. at 521.
170. See id.
171. See id. at 522.
Although the act proposes lucrative liquidated damages and treble damages for unlawful use of genetic information, it does not address criminal penalties.\textsuperscript{172} The drafters of the model act maintained that any future legislation must balance the individual's need for privacy and autonomy against science's need to continue proper and useful genetic research.\textsuperscript{173} In stressing the need for Congress to adopt the ELSI recommendations, Dr. Francis Collins concluded that "[g]enetic discrimination has been hailed as the 'civil rights' issue of this decade. We have the unique opportunity to address genetic privacy and discrimination issues now as the scientific information unfolds, before we find ourselves in a full-fledged crisis."\textsuperscript{174}

A. State Response

To keep pace with the swift advancements in biotechnology, state legislatures saw an explosion of bills addressing genetic privacy in the insurance and employment contexts.\textsuperscript{175} According to the National Conference of State Legislatures, at least twenty-six states had passed legislation prohibiting the discriminatory use of genetic information by insurance companies by 1997.\textsuperscript{176}

The principal struggle in enacting statutes governing genetic information is the attempt to strike a balance between the rights of the individual to genetic privacy and ownership of his germline, and the needs of science to have unlimited access to the results of genetic tests and experiments. The laborious process of New Jersey's Genetic Privacy Act\textsuperscript{177} through the legislature and the governor's office gives a telling indication of the competing interests at play throughout the enactment process of genetic regulation.

The struggle in New Jersey stemmed from one deceptively simple provision of the Act: the classification of genetic information as the

\textsuperscript{172} See id.
\textsuperscript{173} See id. at 522-23.
\textsuperscript{174} Advances in Genetics Research, supra note 126, at 49.
\textsuperscript{175} See Burnett, supra note 168, at 509.
\textsuperscript{176} See Robert Pear, Concerned States Pass Legislation Regulating Genetic Testing Results, ROCKY MTN. NEWS, Nov. 2, 1997, at 18A. Carl Feldbaum, president of the Biotechnology Industry Organization, representing 730 companies, expressed alarm at the rapid growth of legislative initiatives governing genetic research: "The sponsors of these bills are well intentioned[, ] but often they don't understand the science or the potential consequences of their bills. Some of the legislation would virtually stop genetic research or severely limit our ability to conduct clinical trials." Id.
property right of its owner.\textsuperscript{178} This seemingly innocent provision raised the powerful hackles of New Jersey's booming insurance and genetic research industries. Dr. Philip Reilly, a clinical geneticist and director of the Shriver Center for Mental Retardation in Waltham, Massachusetts, after analyzing the bill, declared that the property right provision "could dramatically change the discipline of pathology and could impose major costs on research."\textsuperscript{179} George Annas, Professor of Health Law at Boston University School of Public Health, countered that "people should own their genetic information, their 'probabilistic future diary'" and that "[t]he argument that such property rights will drive research jobs out of New Jersey is 'just a scare tactic.'"\textsuperscript{180}

On November 19, 1996, Governor Christie Whitman signed the Genetic Privacy Act into law, following the deletion of the offending provision on genetic property rights.\textsuperscript{181}

Despite this deletion, the New Jersey Genetic Privacy Act met a number of the requirements that ELSI had previously recommended for the "model" Genetic Privacy Act, as have a number of other state statutes. Some states have been less reticent than New Jersey and have declared that genetic information is the property right of the individual to whom it pertains.\textsuperscript{182} In general, however, most states have opted to follow New Jersey in stopping short of providing property rights for genetic information. They have, instead, made statements of varying forcefulness prohibiting the use of genetic information in employment, or, at least banning employment discrimination on the basis of genetic test results. Iowa, North Carolina, New Hampshire, New York, Rhode Island, Texas, and Wisconsin have enacted statutes that ban genetic testing and genetic discrimination in the workplace,\textsuperscript{183} and, in some


\textsuperscript{179} Id.

\textsuperscript{180} Id.

\textsuperscript{181} See Statelines New Jersey: Governor Signs Genetic Privacy Act, AMERICAN HEALTHLINE, Nov. 20, 1996, available in Westlaw, ALLNEWS database. Governor Whitman said that "[t]his legislation strikes an important balance between protecting privacy and preventing discrimination, while ensuring that scientific and medical research are not unduly inhibited or burdened." Id.

\textsuperscript{182} See OR. REV. STAT. § 659.715 (1997). Under this statute, however, if the genetic sample or information is to be used for anonymous research, that information is not property of the individual. See id.; see also FLA. STAT. ANN. § 760.40(2)(a) (West 1997) (requiring informed consent of the person to be subjected to DNA testing and analysis).

cases, ban the sale and interpretation of genetic information to the employer by a third party.\textsuperscript{184} New Hampshire and Wisconsin expanded the ban on the use of genetic information by prohibiting even voluntary agreements offering employment or benefits in exchange for submission to testing.\textsuperscript{185}

Unfortunately, with the exception of Rhode Island, most of the states that have enacted genetic privacy legislation have provided for a variety of exceptions which allow the use of genetic information in the workplace and which, effectively, undercut the prohibitions in the statutes. Iowa's and Wisconsin's statutes allow genetic testing with the employee's written and informed consent for the limited purposes of investigating workers' compensation claims and determining an employee's susceptibility to a workplace toxin.\textsuperscript{186} The overall strength of New Hampshire's ban on forced genetic testing is significantly weakened by the concession that an employer is not prohibited from genetic testing to determine "whether an individual meets reasonable functional standards for a specific job or task."\textsuperscript{187} Oregon authorizes the genetic testing of an individual if informed consent is granted and if the test is solely to determine a bona fide occupational qualification.\textsuperscript{188} Likewise, New York's Civil Rights Law states that an employee can be denied employment on the basis of a "unique genetic disorder" if it can be "clearly shown" that the disorder would prevent the employee from performing the particular job.\textsuperscript{189} In light of these exceptions, an employer conducting business in any state other than Rhode Island will have, at best, very limited and, at worst, conflicting guidance regarding the utilization of genetic information. Remedies available to victims of genetic discrimination vary as well, ranging from criminal misdemeanor charges for the intentional disclosure of genetic information\textsuperscript{190} to the im-

\begin{itemize}
\item \textsuperscript{186} See Iowa Code § 729.6(7)(a)-(b); Wis. Stat. Ann. § 111.372(4)(a)-(b).
\item \textsuperscript{188} See Or. Rev. Stat. § 659.227(6) (1997). When tests are conducted for the purpose of determining qualifications, the statute proscribes that unless a court order says otherwise, the results must be destroyed as soon as the purpose is accomplished. See id. at § 659.715(6). Texas includes a similar provision in its statute. See Tex. Lab. Code Ann. § 21.405 (West Supp. 1998).
\item \textsuperscript{189} See N.Y. Civ. Rights Law § 48-a (McKinney 1996). Additionally, the New York employer is allowed to administer genetic tests "to determine the employee's susceptibility to potentially carcinogenic, toxic, or otherwise hazardous chemicals or substances found in the workplace environment," provided that the employer does not terminate or adversely affect the employee's terms of employment based on the results. N.Y. Exec. Law § 296(19)(c)(3) (McKinney Supp. 1999).
\item \textsuperscript{190} See Fla. Stat. Ann. § 760.40(2)(b) (West 1997).
\end{itemize}
position of monetary penalties for damages.\footnote{See N.J. STAT. ANN. § 10:5-49 (West Supp. 1998); R.I. GEN. LAWS § 28-6.7-3 (1995).}

B. Federal Response

On September 13, 1990, just months after the release of the joint DOE and NIH publication outlining the goals for the first five years of the Human Genome Project,\footnote{See THE FIRST FIVE YEARS, supra note 103.} Representative John Conyers (D-MI) introduced a bill, the Human Genome Privacy Act,\footnote{H.R. 5612, 101st Cong. (1990).} with a warning that the "[p]ublic release of people's genetic information is a Pandora's Box that is best left unopened."\footnote{Richard A. Bornstein, Note, Genetic Discrimination, Insurability and Legislation: A Closing of the Legal Loopholes, 4 J.L. & POL'Y 551, 579 (1995).} The limited scope of the bill was "[t]o safeguard individual privacy of genetic information from the misuse of records maintained by agencies or their contractors or grantees."\footnote{H.R. 5612.} The introductory section of the bill, outlining the legislative findings and purposes, gave a total tally of the amount of funding appropriated to the DOE and the NIH in fiscal years 1989 to 1991,\footnote{See id. § 2(a)(6)-(7). The amounts given to the NIH and DOE, respectively, were: 1989 - $28.3 million, $17.5 million; 1990 - $39.5 million, $26 million; and in 1991 - $108 million, $45 million.} and warned that the advances of the Human Genome Project had "greatly magnified the potential harm to individual privacy."\footnote{Id. § 2(a)(3).} The bill proposed a ban on the disclosure of genetic information to third parties without informed consent and allowed individuals to request the review and amendment of their genetic records.\footnote{See id. §§ 112 & 114(1).} The exceptions to the requirement of informed consent included the use of information by government employees "in the performance of [their] duties,"\footnote{Id. § 122(a).} the disclosure of information to medical professionals in connection with the care and treatment of a specific individual,\footnote{See id. § 123(a).} and disclosure for the purpose of "alleviat[ing] emergency circumstances affecting the health or safety of any individual."\footnote{Id. § 124(2).} The enforcement provisions assessed fines of up to $30,000, eighteen months in jail, or both for the selling of genetic information...
stolen from an agency, but capped damage awards in suits against federal agencies at $1000.

The major weaknesses of the bill were its broad exceptions and its narrow purview. The exceptions were so numerous and generalized that they effectively undercut the confidentiality protections that the bill was enacted to protect. The bill was completely silent on the requirements of “informed consent,” focusing primarily on what could be done with the information once the consent had been obtained. Lastly, the bill only prohibited disclosure from government agencies, leaving the door wide open for disclosure by medical personnel, insurance providers, and private genetic research companies.

The Human Genome Privacy Act languished and finally expired without enactment. There were no other federal bills proposed until 1995, when, within a period of five months, six separate bills were proposed. It is difficult to speculate as to what caused the clarion call for Congress in 1995. One can surmise that it might have been the completion of the first five years of the Human Genome Project, or the declaration in March 1995 by the Equal Employment Opportunity Commission (“EEOC”) that genetic testing constituted discrimination under the ADA, or possibly even pressure from the rapidly developing state legislation governing genetic information. In any event, the outpouring of congressional proposals seemed to indicate that the government had finally realized the necessity of federal action to establish at least a minimum level of protection throughout the country.

Senator Mark Hatfield (R-OR) introduced the Genetic Privacy and Nondiscrimination Act of 1995 in the Senate on November 15, 1995.

202. See id. § 141(b).
203. See id. § 142(b)(1).
205. See id.
206. See id.; see also Bornstein, supra note 194, at 580 (“The greatest weakness [of the bill] was that it only prohibited disclosure from government agencies . . .”).
208. See infra notes 237-42 and accompanying text.
209. See Burnett, supra note 168, at 530-31.
THE CASSANDRA COMPLEX

Representative Clifford Stearns (R-FL) sponsored it in the House two weeks later. The legislative findings, borrowing heavily from the ELSI model, stressed the need to both “protect individual privacy and to permit legitimate genetic research.” The section of the bill addressing employment practices simply stated that

[n]o employer may seek to obtain, obtain, or use the genetic information of an employee or a prospective employee, or require a genetic test of an employee or prospective employee, to distinguish between or discriminate against or restrict any right or benefit otherwise due or available to the employee or prospective employee.

The bill fortified the employment provision by according the powers, procedures, and remedies set forth in sections 705 to 709 of the Civil Rights Act of 1964 to anyone alleging a violation. Unlike the section governing insurance providers, the bill provided no exceptions to the general ban for employers. Although the bill can be admired for being the first to provide for the protection of genetic information, it failed to address several other significant issues, including “the property rights in the materials themselves and the apportionment of benefits from research and development using such materials.”

Senator Pete Domenici (R-NM), one of the chief proponents of federal funding for the Human Genome Project, introduced an ambitious bill into the Senate on June 24, 1996—the Genetic Confidentiality and Nondiscrimination Act of 1996. The legislative findings in the bill contrasted sharply from those of prior versions due to their foreboding tone. The bill used phrases such as “[g]enetic information has been misused resulting in harm to individuals” and “[g]enetics has the potential to penetrate many aspects of life including employment, insurance, ... and even one’s self-perception.” The provisions for collection, stor-
age, and analysis of DNA samples were detailed and thorough with specific instructions regarding the content of notices and authorizations.\textsuperscript{218} The bill added an equally detailed provision governing disclosure, amendment, and destruction of genetic records.\textsuperscript{219} In section 104, the bill boldly declared: "A DNA sample is the property of the individual."\textsuperscript{220} The section that addressed discrimination by employers substantially followed the broad statement of the 1995 version (although it clarifies the text significantly).\textsuperscript{221} In short, the 1996 version of the Genetic Confidentiality and Nondiscrimination Act was comparatively clear in its mandate and straightforward in its provisions—thereby ultimately guaranteeing its death on the Senate floor.

The "kinder, gentler" version of the Genetic Confidentiality and Nondiscrimination Act made its appearance on March 11, 1997 under the joint sponsorship of Senators Domenici, Christopher Dodd (D-CT), and James R. Jeffords (R-VT);\textsuperscript{222} Domenici was, at the time, the Chairman of the Labor, Health and Human Resources Committee.\textsuperscript{223} In his address, Senator Domenici stressed the need to begin the dialogue regarding the protection of genetic information.\textsuperscript{224} In declaring his continued support of the Human Genome Project, Senator Domenici warned that "[w]hile all that is going on, the one thing we do not need, we do not need an abuse of the information by either researchers, scientists, insurance companies or the like, such that it would excite the American people to turn against such research."\textsuperscript{225} In outlining the key provisions of the revised bill, Senator Domenici flatly declared that "[t]his legislation will very simply preclude employers or health insurers from requesting or requiring genotype information as a condition of employment or health insurance."\textsuperscript{226}

\begin{enumerate}
  \item \textsuperscript{218} See S. 1898 §§ 101-05.
  \item \textsuperscript{219} See id. §§ 201-05.
  \item \textsuperscript{220} Id. § 104(a).
  \item \textsuperscript{221} See id. § 301(a). The bill states:

  An employer may not seek to obtain, obtain or use the genetic information of an employee or a prospective employee, or require the collection of a DNA sample of an employee or prospective employee for analysis to distinguish between, discriminate against, or restrict any right or benefit otherwise due or available to the employee or prospective employee.

  Id.

  \item \textsuperscript{222} See S. 422, 105th Cong. (1997).
  \item \textsuperscript{223} See 143 CONG. REC. S2140 (daily ed. Mar. 11, 1997) (statement of Sen. Domenici).
  \item \textsuperscript{224} See id.
  \item \textsuperscript{225} Id. at S2141.
  \item \textsuperscript{226} Id. at S2142.
\end{enumerate}
After reviewing the newest version of the Genetic Confidentiality and Nondiscrimination Act, one is hard pressed to find the flat preclusion that Senator Domenici alluded to in his sponsoring speech. The legislative findings in the bill are clearly attenuated from the 1996 version. The language of existing misuse and damage to "self-perception" has been replaced by laudatory statements about the benefits provided by research in human genetics. The lengthy requirements for the collection, storage, and analysis of DNA samples have been shortened and simplified in the 1997 version. The declaration of an individual's ownership of his genetic samples is missing altogether. The section addressing discrimination by employers is drastically different. The 1997 version stipulates:

An employer may request or require or use the genetic information of an employee for the purpose of—

(1) permitting a genetically susceptible employee to avoid occupational exposure to substances with a mutagenic or teratogenic effect; or

(2) determining a genotype that is otherwise directly related to the work and is consistent with business necessity.

In a presidential press briefing held on July 15, 1997, White House spokesperson Mike McCurry predicted:

I think that the fact that the legislation is attracting bipartisan support, that the chair of one of the relevant committees will have some things to say that we hope will be positive about the bill bodes very well for consideration of the legislation in this Congress, and hopefully in a short while.

Although both McCurry and President Clinton spoke at length about the possible impact of the new bill on health care providers, neither made any mention of the effect of the proposed legislation on employment.

On January 20, 1998, Vice President Gore, in an address to the National Academy of Science, called for legislation that would bar an employer from discriminating against its employees on the basis of genetic

227. See S. 422 § 2(a)(2) ("Research in human and medical genetics continues to provide and to predict immense health benefits to individuals and their families.").

228. See id. §§ 101-102.

229. Id. § 401(a).


231. See id. However, the briefing addressed the testing for sickle cell anemia in the 1970s in order to illustrate the use by insurance companies of genetic information to deny coverage. See id.
information. Vice President Gore declared: "Miraculous scientific achievements can help build an America that is healthier in body and in spirit. That's no small feat. But science and society must always advance together, for neither can ever truly advance alone."  

C. Administrative Guidance

In the past, the EEOC, charged with the enforcement of both Title VII and the ADA, has specifically excluded predisposition to disease as a covered condition under its regulations. It has further declined to apply its protection to personality traits such as poor judgment, quick temper, or irresponsible behavior. Genetic conditions that have been cited in the legislative history as protected by the ADA include genetic conditions like muscular dystrophy, multiple sclerosis, cystic fibrosis, dyslexia, hemophilia, and retinitis pigmentosa, but only once the conditions have shown overt debilitating symptoms. These exclusions would seem to indicate that asymptomatic genetic predisposition to mental and physical diseases would fall outside the protection of the Act.

On March 15, 1995, however, the EEOC issued regulations clarifying the definition of "disability" under the ADA. Tucked within a larger technical document was the EEOC's first statement prohibiting an employer from discriminating against a worker on the basis of his genetic makeup. The provision extends coverage to include "individuals who are subjected to discrimination on the basis of genetic information relating to illness, disease, or other disorders." Dr. Francis Collins

233. See EQUAL EMPLOYMENT OPPORTUNITY COMM'N, A TECHNICAL ASSISTANCE MANUAL ON THE EMPLOYMENT PROVISIONS (TITLE I) OF THE AMERICANS WITH DISABILITIES ACT, at II-2 (1992) [hereinafter TECHNICAL ASSISTANCE MANUAL].
234. See id.
236. See Rick Weiss, Gene Discrimination Barred in Workplace, WASH. POST, Apr. 7, 1995, at A3; see also Bornstein, supra note 194, at 581 ("The EEOC released guidelines which clarified the definition of 'disability' under the ADA to include 'individuals who are subjected to discrimination on the basis of genetic information relating to illness, disease, or other disorders.'").
237. See Weiss, supra note 236, at A3; see also Abbey S. Meyers, EEOC Genetic Ruling Protects Society, 4 EMPL. TESTING L. & PL'y REP. 103, 103 (1995) (stating that "[n]or can one deny an applicant a job as long as the disability does not interfere with an employee's ability to do the job").
238. EQUAL EMPLOYMENT OPPORTUNITY COMM'N, 2 EEOC COMPLIANCE MANUAL § 902, at 902-45 (1995) (defining the term "disability").
exulted, "[t]his solves a huge dilemma that's been sitting there without
an obvious solution . . . . This is wonderful news for the American pub-
lic." However, in hearings held before the Senate Committee on Labor
and Human Resources in July 1996, Dr. Collins tempered his enthusi-
asm. He noted that the EEOC interpretation fails to cover unaffected
carriers of recessive genes and that it does not prevent employers from
obtaining a general release from an applicant once there has been a pre-
employment offer. Bob Silverstein, counsel for Senator Tom Harkin
(D-Iowa), the chief sponsor of the ADA, noted the considerable diffi-
culties in proving discrimination under this new regulation. To qualify
under the terms of the ADA, people must show not only that they have a
genetic defect, but also that they were regarded as disabled and dis-
~criminated against by an employer on account of that perception.

Following the example of the state and federal legislatures, the
EEOC has effectively tempered its ban on genetic discrimination with
nebulous exceptions that threaten to swallow the rule, leaving the em-
ployer with no administrative regulations to guide it when it inevitably
confronts the legal dilemma of access to genetic information.

V. THE CASSANDRA COMPLEX

Confronted with the ethical and legal dilemmas of the genetic
workplace with little or no legislative or administrative guidance, the
employer of the new millennium will be left with few options for
avoiding legal consequences, whether the employer chooses to use the
new-found genetic information or not. To make matters more difficult
for the employer, genetic tests, painted by science as fairly clear-cut, are
not, at the current stage, precise predictors of the medical future of em-
ployees or job applicants. As illustrated by the failed experiments with
sickle cell testing, those carrying a gene may never show manifestations
of its effect. If the gene does manifest itself, its effects may vary
widely from individual to individual, making predictions of its manifes-
tations a virtual guessing game.

Additionally, gene reading, except in cases of single gene disease,
is an incomplete measurement, which does not take into account the
possibility of avoiding disease through environmental or personal health

239. Weiss, supra note 236, at A3.
240. See Advances in Genetics Research, supra note 126, at 15.
241. See id. at 15-16.
242. See Council on Ethical and Judicial Affairs, American Medical Association, Use of Ge-
243. See id.
factors. Virtually all employees and job applicants have hereditary gene characteristics that predispose them to the onset of particular illnesses or diseases, and therefore, without considering the importance of environmental or lifestyle factors, everyone can be considered a potential drain on the limited resources of an employer. Because of the inherent imprecision in current genetic technology however, it will be difficult for an employer to make and justify employment decisions based solely on the results of genetic tests.

The time in which genetic knowledge will be most controversial for employers will be the often lengthy phase between the discovery of a genetic variation responsible for disease and the availability of treatment for that disease. It is during this time that loss of employment or insurance, discrimination, or stigmatization is most likely to occur. In this twilight period, the employer will need particular guidance in making employment decisions on the basis of genetic information—guidance that, to date, has not been forthcoming from the government. This lack of guidance is at the root of the Cassandra complex, where the employer has access to potentially devastating information regarding an employee's future physical or mental health, but will be

244. See JERRY E. BISHOP & MICHAEL WALDHOLZ, GENOME: THE STORY OF THE MOST ASTONISHING SCIENTIFIC ADVENTURE OF OUR TIME—THE ATTEMPT TO MAP ALL THE GENES IN THE HUMAN BODY 303 (1990); see also Brokaw, supra note 35, at 321 (describing the importance of considering family medical history or further investigating the person's chromosomes in a laboratory test). It has been speculated that all individuals possess five to seven lethal recessive genes, plus an undetermined number of genes that indicate a predisposition to develop diseases based on dealings with the environment, including diet, work, and other environmental factors. See Alexander Morgan Capron, Which Ills to Bear?: Reevaluating the "Threat" of Modern Genetics, 39 EMORY L.J. 665, 690 (1990).

245. See Rothstein, supra note 235, at 46-47. "We still don't understand even the simplest kind of hereditary disease, such as Huntington's chorea, which is caused by the mutation of only one gene. This summer researchers made the first major breakthrough in understanding how that mutation might lead to the destruction of the brain—but this came four years after the discovery of the mutation." Schoofs, supra note 160, at 18.

246. This difficulty will be most evident in genetic screening for psychological traits, where it has been estimated that genes account for between 40 and 60 percent of the variations in personality and between 40 and 70 percent of the differences in IQ. See Schoofs, supra note 160, at 18. It is, however, in the development of personality traits and intelligence that the environment exerts its greatest influence. See id. Family background or life experience may, for example, determine whether an "anxiety" gene will create a person who is clinically neurotic or a person who is merely conscientious. See id. As David Lykken, a Minnesota researcher of personality variations in identical twins, postulated: "The psychopath and hero are twins on the same genetic branch, and the difference is experience." Id. For a discussion of the difficulties an employer will encounter in the evaluation of psychiatric disorder in the workforce, see John D. Thompson, Psychiatric Disorders, Workplace Violence and the Americans with Disabilities Act, 19 HAMLIN L. REV. 25 (1995).

247. See THE FIRST FIVE YEARS, supra note 103, at 65-71.

248. See BISHOP & WALDHOLZ, supra note 244, at 304.
unable to use it in making employment decisions due to the potential for extensive litigation. The simple solution of ignoring the newfound genetic information will not be an option either. Not only will the employer be unable to ignore the obvious financial and safety benefits which the tests will confer, but the very ability of an employer to foresee future genetic consequences will hold it responsible for any detrimental effects caused by the harmful manifestations of known genetic conditions. In choosing either side of the coin, using or ignoring genetic information, the employer is likely to lose.

A. To Test or Not to Test?

Left to their own devices, most employers would understandably welcome information that would prevent the hiring of employees who would be disproportionately susceptible to illness. It would be naïve to ignore the fact that employment decisions, even in the pre-genetic era, are partially influenced by information gleaned from the medical histories of applicants and their families. The most obvious benefit to an employer in having access to an employee’s genetic information (although the one least likely to be used as justification) is the potential for cost containment. Sick employees account for increased costs caused by sick leave, absenteeism, workers’ compensation expenses, and lost goodwill. Additionally, employees or dependents with illnesses account for greater costs in providing health and life insurance for a workforce. For employers with self-insured plans, where the employer assumes direct responsibility for healthcare expenses, the ability to predict catastrophic illness could have a significant impact on the solvency of a company’s health plan.


250. See id. at 371-72.


252. See Brokaw, supra note 35, at 326.

253. See 29 C.F.R. § 1630.4(f) (1997). The ADA prohibits an employer from firing or refusing to hire an employee because of potential increases in future health care costs caused by the disability of the employee or of the employee’s dependents. See TECHNICAL ASSISTANCE MANUAL, supra note 233, at VII-9. However, the ADA leaves the door open for an employer to tailor health benefits in response to insurance underwriting or actuarial risks, including the denial
Another valid reason for an employer to access workers' genetic information is to ensure the safety of the worker, the employer, and society at large. Employers concerned with the worker's safety and health could use genetic testing and screening to provide information about threats posed to employees and applicants by existing workplace conditions. Because monitoring may disclose genetic damage that has already occurred, its use would be especially helpful as a means of preventing future damage. The screening of applicants might disclose a disease predisposition that may be triggered by workplace conditions, allowing an employer to offer a valuable warning to job candidates of the danger inherent in applying for certain positions.

The employer's responsibility for providing a safe and healthy workplace extends beyond the employee. An employer has a legal and moral duty to ensure that employees are professionally, physically, and psychologically capable of performing their duties. Co-workers and members of the public could have a legal right to access genetic information about a worker where the manifestation of his genetic variance might put them at risk. Recognizing the safety concerns of both employers and third parties, the ADA has authorized employers to discriminate where a disabled individual poses a direct threat to the health and safety of others. This exception might justify an employer's decision of coverage for pre-existing conditions or for certain procedures or treatments. See 42 U.S.C. § 12001(c)(2)(3) (1994); TECHNICAL ASSISTANCE MANUAL, supra note 233, at VII-9. For legislative history, see H.R. REP. No. 101-485, pt. 2 at 137-138. See also Miller & Huvos, supra note 249, at 381-82 (describing employment practices the ADA does and does not permit). If genetic predisposition can be cast as a pre-existing condition, an employer can design a health plan to exclude payment for any medical costs arising from a genetic condition diagnosed at the time of hire. Alternatively, an employer can design a plan to exclude certain diseases that appear with greater regularity in the genetic screening of its current employees. This capacity for the redesign of health plans, effectively authorized by the ADA, will discourage high-risk applicants from seeking employment where the financial burdens they will incur due to health plan limitations are too large. See id. at 382.


255. See id. at 5.

256. See id.; see also Lori B. Andrews & Ami S. Jaeger, Confidentiality of Genetic Information in the Workplace, 17 AM. J.L. & MED. 75, 76 (1991) (explaining how genetic information may be used to warn people with particular genetic dispositions to avoid certain jobs that may trigger an illness).

257. See Andrews & Jaeger, supra note 256, at 94.

258. See id. at 96.

259. See 29 C.F.R. § 1630.2(e) (1997); Robert John Maseleck, Jr., Note, Employee Medical Screening Under the Americans with Disabilities Act of 1990, 26 SUFFOLK U. L. REV. 653, 684 (1992); see also TECHNICAL ASSISTANCE MANUAL, supra note 233, at II-3 (detailing that an employee with a contagious disease could be discriminated against if they "posed a direct threat to health or safety, if no reasonable accommodation could reduce or eliminate this threat").
sion to exclude individuals with certain genetic traits from positions in which the traits might create health and safety risks in the workplace.

In addition to the financial and safety benefits to the employer in accessing genetic information, genetic testing may actually be mandated by state legislation governing workers’ compensation plans or by federal legislation such as the Occupational Safety and Health Act ("OSHA"). Workers’ compensation is a state mandated system of strict liability in which employers assume responsibility for employees’ work-related injuries or illnesses. Compensation depends on medical evidence that the employee’s condition resulted from workplace exposure. In many states, the responsibility of the current employer for workplace injury or illness is mitigated by apportionment statutes that divide liability for medical costs among all of the companies that could have contributed to the employee’s current condition. In order to insure an appropriate partitioning of financial responsibility, genetic monitoring may be called upon to analyze an employee’s health through a succession of exposures to workplace hazards. Moreover, genetic screening may be utilized to determine whether workplace exposure played any part in the onset of the disease.

The employer’s refusal to institute genetic testing in the workplace may also run headlong into OSHA’s promotion of employer-conducted medical exams. OSHA mandates biological monitoring through “periodic analysis of body fluids, tissues and excreta in order to measure [the] impact of the body’s exposure to chemical agents and to evaluate the health risks these chemicals pose.” Some OSHA health standards, such as those regulating arsenic, lead, and acrylonitrile, offer protection to

260. 29 U.S.C. §§ 651-78 (1994). OSHA was enacted in 1970 as a federal effort to assure a safe work environment by investigating industrial diseases and their causal connections to the workplace and by mandating preventive workplace safety practices. See Judith Richter, Taking the Worker As You Find Him: The Quandry of Protecting the Rights As Well As the Health of the Worker with a Genetic Susceptibility to Occupational Disease, 8 MD. J. CONTEMP. LEGAL ISSUES 189, 206 (1997); see also 29 U.S.C. § 651 (containing the opening congressional statement of findings and declaration of purpose and policy).
261. See Richter, supra note 260, at 193.
262. See Rothstein, supra note 32, at 1475-76.
263. See id. at 1477.
264. A number of states allow the use of pre-employment data in computing disability for workers’ compensation awards for occupational disease. See High-Risk Groups, supra note 46, at 153-54. Other states have provisions for second injuries or handicaps that allow the pre-existing component of an occupational illness to be deducted from either the employee’s benefit or the employer’s premium. See id.
265. See Richter, supra note 260, at 209-10.
sensitive employees by requiring medical surveillance of those exposed to designated concentrations of the substances.\textsuperscript{267} In particular, proponents of genetic testing in the workplace have pointed to a section in the OSHA regulations governing cancer-causing agents.\textsuperscript{268} This section provides that "before an employee is assigned to enter a regulated area, a preassignment physical examination by a physician shall be provided. The examination shall include the personal history of the employee, family and occupational background, including genetic and environmental factors."\textsuperscript{269} When confronted with conflicting medical and safety requirements established under other federal laws, the ADA regulations clearly state that the employer can follow these requirements without violating the ADA.\textsuperscript{270} In light of the OSHA mandate and the ADA's concession, an employer may be found negligent for failing to provide genetic testing before assigning an employee to certain OSHA designated positions.

Tempted by the financial benefits gained by identifying genetic predisposition to disease, fearing the potential harm from the harmful manifestations of genetic conditions, and confused by the government's contradictory signals, the employer will most likely feel compelled to institute genetic testing in the workplace. However, by doing so, the unwitting employer will run directly into the legal and ethical contradictions inherent in the Cassandra Complex.

\section*{B. "Heads You Lose": Liability for Using Genetic Information}

To date, there has not been a suit by an employee charging an employer with genetic discrimination, but it would be naïve to assume that this relative quiet will continue once advances in genetic tests make workplace screening more economical and accurate. Genetic discrimination has as yet to be defined by the courts, but has been identified by commentators as "discrimination directed against an individual or family based solely on an apparent or perceived genetic variation from the 'normal' human genotype."\textsuperscript{271}

\begin{thebibliography}{99}
\bibitem{267} See 29 C.F.R. §§ 1910.1018, .1025, .1045 (1997); see also Rothstein, supra note 32, at 1427 (finding medical surveillance is required "for all employees exposed to concentrations above the 'action level'").
\bibitem{268} See 29 C.F.R. § 1910.1003(g)(1)(i).
\bibitem{269} Id. (emphasis added); see also Richard Severo, Federal Mandate for Gene Tests Disturbs U.S. Job Safety Official, N.Y. TIMES, Feb. 6, 1980, at A1 (describing the confusion of OSHA officials when asked to explain the genetic mandate in Part 1910, Title 29).
\bibitem{270} See TECHNICAL ASSISTANCE MANUAL, supra note 233, at VI-5.
\bibitem{271} Paul R. Billings et al., Discrimination as a Consequence of Genetic Testing, 50 AM. J. HUM. GENETICS 476, 476 (1992). Individuals at risk for genetic discrimination may include (a)
An employer’s chances of prevailing against a charge of genetic discrimination can be predicted by examining judicial decisions under current anti-discriminatory legislation, specifically the ADA. The ADA maintains that an individual is considered to have a disability if that individual either has “(A) a physical or mental impairment that substantially limits one or more of the major life activities of such individual; (B) a record of such an impairment; or (C) . . . [been] regarded as having such an impairment.” Asymptomatic individuals who manifest a genetic predisposition to a physical or mental illness would most likely be covered under the third classification of a disability if they are otherwise qualified to perform the essential functions of the position in question and are discriminated against on the basis of their genetic predisposition.

On March 3, 1987, the Supreme Court decided a landmark case that clarified the requirements of the “regarded as” prong of the ADA’s

asymptomatic individuals who carry a detrimental gene; (b) those who are heterozygotic for a condition but will never be affected by it; (c) those who have genetic polymorphism (similar genes that assume different forms); and (d) relatives of these individuals who have or are perceived as having genetic conditions. See Miller & Huvos, supra note 249, at 372; see also Adrienne Asch, Genetics and Employment: More Disability Discrimination, in THE HUMAN GENOME PROJECT AND THE FUTURE OF HEALTHCARE 158, 161 (Thomas H. Murray et al. eds., 1996) (commenting that “people who never before were perceived as disabled will discover that their genetic characteristics lead them to be viewed as disabled by others—notably employers and insurers”).

272. See 42 U.S.C. §§ 12101-213 (1994). Enacted on July 26, 1990, the ADA was intended to supplement the Rehabilitation Act of 1973 (29 U.S.C. §§ 701-96) by extending coverage to private sector employees. See Rothstein, supra note 235, at 32. The Act provides in part that “[n]o covered entity shall discriminate against a qualified individual with a disability because of the disability of such individual in regard to . . . hiring, advancement, or discharge of employees, employee compensation, job training, and other terms, conditions, and privileges of employment.” 42 U.S.C. § 12112(a). The Code of Federal Regulations explains that “[t]he ADA is a Federal antidiscrimination statute designed to remove barriers which prevent qualified individuals with disabilities from enjoying the same employment opportunities that are available to persons without disabilities.” Appendix to part 1630-Interpreting Guidance on Title I of the American with Disabilities Act, 29 C.F.R.§ 1630, app. at 336 (1997); see also 29 C.F.R. § 1630.4 (governing forms of prohibited discrimination); TECHNICAL ASSISTANCE MANUAL, supra note 233, at VII-9 (discussing health insurance and employee benefit plans).

273. 42 U.S.C. § 12102(2) (emphasis added). Courts have further clarified that one is regarded as having a substantially limiting impairment if the individual (1) has an impairment which is not substantially limiting but which the employer perceives as constituting a substantially limiting impairment; (2) has an impairment which is substantially limiting only because of the attitudes of others toward such an impairment; or (3) has no impairment at all but is regarded by the employer as having a substantially limiting impairment.

Bridges v. City of Bossier, 92 F.3d 329, 332 (5th Cir. 1996); see also MacDonald v. Delta Air Lines, Inc., 94 F.3d 1437, 1444 (10th Cir. 1996) (discussing what constitutes a mental or physical impairment).
protected classification. In School Board of Nassau County v. Arline, the Court reviewed the case of an elementary school teacher who was discharged from her job due to a history of tuberculosis. The Court found that the school board violated section 504 of the Rehabilitation Act of 1973 because “the fact that a person with a record of a physical impairment is also contagious does not suffice to remove that person from coverage under [section] 504.” The Court declared:

By amending the definition of “handicapped individual” to include not only those who are actually physically impaired, but also those who are regarded as impaired and who, as a result, are substantially limited in a major life activity, Congress acknowledged that society’s accumulated myths and fears about disability and disease are as handicapping as are the physical limitations that flow from actual impairment.

A year prior to Arline, a district court in Florida upheld a charge of discrimination filed by an epileptic employee who was terminated from his position as a mechanic, even though he maintained that he had never had a seizure. The court concluded that “[i]t is unreasonable to deny a person employment because of a fear of recurrence of a condition which that person has asserted he has never had, when there is no evidence showing that Plaintiff had ever had a seizure.”

In Cook v. Rhode Island, Department of Mental Health, Retardation, and Hospitals, the Court of Appeals for the First Circuit held that a morbidly obese applicant for the position of attendant in a home for the mentally retarded was unfairly denied employment because of the employer’s preconceptions of how her obesity would affect her performance. The court concluded that “denying an applicant even a single job . . . due solely to the perception that the applicant suffers from a physical [limitation] . . . can constitute treating an applicant as if her condition substantially limited a major life activity, viz., working.” In

275. See id. at 276.
276. Id. at 286.
277. Id. at 284. The Court remanded the case to the district court for a determination as to whether Ms. Arline was otherwise qualified for the job of elementary school teacher with a warning that it conduct an individualized inquiry of how her handicap might impact on the essential functions of her position. See id. at 287-88. The Court also laid out the “well-established” basic factors to be used in the inquiry. See id.
279. Id. at 935.
280. 10 F.3d 17 (1st Cir. 1993).
281. See id. at 28.
282. Id. at 26; see also Johnson v. American Chamber of Commerce Publishers, Inc., 108
short, the focus of the "regarded as" inquiry is determined not on the actual existence of an impairment, but on the attitudes of others to the perceived impairment. On the basis of these decisions, an employer would most likely be held liable for disability discrimination if it made an employment decision solely on the basis of a genetic test, without producing further evidence that the employee was not otherwise qualified for the position.

Once a prima facie case of genetic discrimination was established, an employer could have legal recourse in one of the defenses currently available under the ADA to combat a charge of disability discrimination. These defenses include lack of knowledge, undue hardship, and direct threat to health and safety. Unfortunately, an analysis of court decisions addressing these defenses reveals that they would most likely be unsuccessful in the genetic context.

An employer's first line of defense might be to prove that it had no knowledge of the applicant's or employee's genetic condition. The federal regulations to the Rehabilitation Act mandate that an employer must know about an existing specific disability before it can be liable for failing to accommodate the disabled person's needs. In cases involving "hidden" disabilities, courts have held that an employer cannot be liable for disability discrimination if it had no actual or constructive knowledge of an individual's disability. In order to succeed under this defense, an employer would need to affirmatively prove that it either has no possibility of access to genetic information or that the hiring rec-

F.3d 818, 819 (7th Cir. 1997) (holding employer liable for its refusal to hire a telemarketing applicant with 18 missing teeth because it perceived him as being unfit for the position); Katz v. City Metal Co., 87 F.3d 26, 33-34 (1st Cir. 1996) (finding that an employer had wrongfully discharged the plaintiff after he had suffered a heart attack because of the employer's perception that the plaintiff could not resume his normal duties); 29 C.F.R. § 1630.2(g)(1) (1997) (defining disability).

283. See MacDonald v. Delta Air Lines, Inc., 94 F.3d 1437, 1444 (10th Cir. 1996) (quoting Wooten v. Farmland Foods, 58 F.3d 382, 385 (8th Cir. 1995)); see also Francis v. City of Meriden, 129 F.3d 281, 287 (2d Cir. 1997) ("'This third prong is particularly important for individuals with stigmatic conditions that are viewed as physical impairments but do not in fact result in a substantial limitation of a major life activity.'" (quoting H. Rep. No. 101-485 part 2, at 53 (1990)).


285. See Hunt-Golliday v. Metropolitan Water Reclamation Dist., 104 F.3d 1004, 1012-13 (7th Cir. 1997) (holding that a former employee with a mental disability could not prevail in an ADA claim where she failed to present any evidence of the employer's knowledge of her condition); see also Morisky v. Broward County, 80 F.3d 445, 448 (11th Cir. 1996) ("Vague or conclusory statements revealing an unspecified incapacity are not sufficient to put an employer on notice of its obligations under the ADA."); Hedberg v. Indiana Bell Tel. Co., 47 F.3d 928, 932 (7th Cir. 1995) (finding that "an employer cannot be liable under the ADA for firing an employee when it indisputably had no knowledge of the disability"); Landefeld v. Marion Gen. Hosp., Inc., 994 F.2d 1178, 1181-82 (6th Cir. 1993) (holding that an internist could not prove that a hospital suspended him because of his mental illness absent evidence that the hospital knew of such illness).

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ommendation was made by an independent evaluator. The courts have made it difficult for an employer to hide behind the recommendation of a medical or occupational professional in denying opportunities to protected individuals. In *EEOC v. Texas Bus Lines*, the Southern District Court of Texas found an employer liable in an ADA action brought by a morbidly obese applicant who was denied employment on the basis of the recommendation of a physician hired by the employer to perform physical evaluations. The court concluded:

> If an employer’s relationship with a physician who conducts a medical examination results in the discriminatory rejection of applicants protected by the ADA, the employer is liable for a violation of the statute despite the involvement of a third party, the doctor, with whom the employer had a professional arrangement.\(^{287}\)

Based on these decisions, an employer may be able to avoid litigation for genetic discrimination by refusing to administer genetic tests either directly or through a third party examiner. However, in light of the benefits that will be available to the employer through testing and the possible liabilities for failure to test, this will most likely be the least acceptable defense.

If an employer has knowledge of an employee’s or applicant’s genetic information, it could attempt a second defense by proving that providing accommodations for the disabled individual would pose an undue hardship on the finances or operations of the organization.\(^{289}\) Two areas where this defense has proven successful are when the accommodation would substantially interfere with the safe and efficient operations of the business and when the disability itself would preclude the attainment by the employee of the licenses or clearances needed to perform his job.

In the first instance, where an accommodation would interfere with the business’ operations, the courts have specified that the considerations cannot be based on generalized fears about the potential effects of a particular disability, nor about concern over high absenteeism or in-

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287. Id. at 982.
288. See infra Part IV.C.
289. When considering if an accommodation poses an undue hardship, the EEOC considers: (1) the cost and type of the accommodation; (2) the financial resources of the facility; (3) the overall financial resources of the entity (the parent company of the facility); (4) the kind of operation of the entity; and (5) the effect of the accommodation on the operations of the facility, including the impact on the facility’s ability to conduct business and the productivity of other employees. See 29 C.F.R. § 1630.2(p)(2) (1997).
creased workers’ compensation costs.290 Employers have only been successful, if, after an individualized assessment of the individual’s disability, the employer can provide direct evidence that retaining or accommodating the employee would cause harm to the operations of the business.291 Such evidence will normally be speculative when dealing with asymptomatic genetic conditions. In the second instance of undue hardship, where an employee’s disability, or potential disability interferes with his ability to obtain needed licenses or waivers, the employer can likewise mount a defense of business necessity or undue hardship. In McDaniel v. AlliedSignal, Inc.,292 an employee lost his government mandated security clearance partly because of mental illness.293 The court found that the employer was justified in terminating the employee because no accommodation could have insured the employee’s regaining of his clearance.294

A third employer defense, the legitimate concern with a direct threat to the health and safety of the employee and of others caused by

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290. See, e.g., Cook v. Rhode Island, Dep’t of Mental Health, Retardation, and Hosps., 10 F.3d 17, 27 (1st Cir. 1993) (declining to consider increased absenteeism and workers’ compensation claims in failure to hire obese applicant); Anderson v. Gus Mayer Boston Store, 924 F. Supp. 763, 781 (E.D. Tex. 1996) (finding increased costs of health insurance insufficient reason to exclude employees from company plan); Turner v. City of Monroe, 634 So. 2d 981, 986 (La. Ct. App. 1994) (refusing to consider potential increases in workers’ compensation costs in employer’s decision not to allow employee with back injury to return to work). The EEOC clarifies that ADA prohibitions apply to decisions “based on unsubstantiated concerns about productivity, safety, insurance, liability, attendance, costs of accommodation, accessibility, workers’ compensation costs or acceptance by co-workers and customers.” TECHNICAL ASSISTANCE MANUAL, supra note 233, at 1-11.

291. In EEOC v. Kinney Shoe Corp., 917 F. Supp. 419 (W.D. Va. 1996), the court upheld the termination of an epileptic salesperson prone to unpredictable seizures. The court held that “if an employee causes vast disruption at the workplace, and if no possibility exists of cabining that disruption, then the employee is unqualified for the position. However, the degree of disruption caused by the employee’s disability must be substantial in order to render an employee unqualified.” Id. at 428. Similarly, in Johnston v. Morrison, Inc., 849 F. Supp. 777 (N.D. Ala. 1994), an Alabama district court upheld the firing of a waitress prone to panic attacks when the restaurant became crowded. The court concluded that “[a]n employer or other covered entity is not required to reallocate essential functions.” Id. at 779 (citing Interpretive Guidance on Title I of the Americans with Disabilities Act, 29 C.F.R. App. § 1630.2(o) (alterations in original); see also Zevator v. Methodist Hosp., Civ. A. No. H-94-859, 1995 WL 500637, at *1 (S.D. Tex. 1995) (finding that an employer is not required by the ADA to create a new position or reallocate essential functions).


293. See id. at 1486.

294. See id. at 1490; see also Long v. Chicago Transit Auth., 979 F. Supp. 1214, 1217 (N.D. Ill. 1997) (finding that an applicant’s failure to obtain a waiver from the Department of Transportation precluded a finding of discrimination on the part of the employer who refused to hire him for a bus driver position). But see Sarsycki v. United Parcel Serv., 862 F. Supp. 336, 341 (W.D. Okla. 1994) (finding that employer had failed to conduct individualized assessment before terminating insulin-dependent diabetic who had been denied operator’s license).
the onset of a genetic condition, would likewise be difficult to sustain
without direct proof that the employee’s genetic condition poses an im-
mediate and direct threat to the welfare of others. In order to prove a
“direct threat,” the employer must be prepared to show a significant cur-
rent risk of substantial harm and the harm must be identified and docu-
mented by objective medical and factual evidence. Additionally, even
if a significant risk of substantial harm exists, the employer must con-
sider whether it can be eliminated or reduced below the level of direct
threat by reasonable accommodation.

When confronted with this defense, courts are strict in requiring an
individualized and factually based assessment of the risk. This assess-
ment must include: “(1) The duration of the risk; (2) [t]he nature and se-
verity of the potential harm; (3) [t]he likelihood that the potential harm
will occur; and (4) [t]he imminence of the potential harm.” Courts
would likely reject blanket exclusions based on potential risks posed by
the future manifestations of genetic conditions.

This judicial reluctance to credit unsubstantiated concerns can be
seen from the courts’ conflicted treatment of another silent and unpredict-
dable disability—mental illness. The line between an employee’s pri-
vacy rights and an employer’s responsibility for providing a safe work-
place becomes particularly blurred in situations where an employee’s
mental instability threatens the safety of her supervisor or co-workers.
In Collins v. Blue Cross Blue Shield of Michigan, the plaintiff was
disabled from work as a result of “major depression adjustment disor-

295. The ADA permits employers to require that employees “not pose a direct threat to the
health or safety of other individuals in the workplace.” 42 U.S.C. § 12113(b) (1994). The legisla-
tive history of the ADA and the EEOC regulations, however, have made it clear that the “direct
threat” claim is difficult to prove. See Direct Threat, 56 Fed. Reg. 35,745 (1991) (interpreting the
regulations to be codified as 29 C.F.R. § 1630.2 (r)).
296. See 29 C.F.R. § 1630.2(r) (1997); see also TECHNICAL ASSISTANCE MANUAL, supra note
233, at VI-3 (discussing when medical examinations may be administered by employers).
297. See TECHNICAL ASSISTANCE MANUAL, supra note 233, at VI-3.
298. 29 C.F.R. § 1630.2(r); see also School Bd. of Nassau County v. Arline, 480 U.S. 273,
287-88 (11th Cir. 1987) (discussing the factors to be considered in the assessment of an elementary
schoolteacher with a history of tuberculosis); EEOC v. Chrysler Corp., 917 F. Supp. 1164, 1170-72
(E.D. Mich. 1996) (examining the standards for the “direct threat” defense); Sarsycki, 826 F.
Supp. at 340 (discussing the factors to be considered in deciding whether a person is limited in “a
major life activity”).
299. See Bombrs v. City of Toledo, 849 F. Supp. 1210, 1219-20 (N.D. Ohio 1993) (holding
that “blanket exclusions are to be given the utmost scrutiny, and are, as a general rule, to be dis-
couraged”).
1996).
In the course of an examination by a company appointed psychiatrist, the plaintiff made threatening statements against her supervisor. The psychiatrist felt that the remarks were not threats, but were instead "expressions of the plaintiff's thoughts" and that she was not a danger in the workplace. However, the plaintiff was terminated upon her return to work. In an unexpected decision, the court found that the statements, made in the private setting of a psychiatric evaluation, were merely "homicidal ideations" consistent with the plaintiff's psychiatric diagnosis, and did not disqualify her from employment. Conversely, in Mazzarella v. United States Postal Service, the District Court of Massachusetts held that the employer was justified in terminating an employee suffering from "an explosive personality disorder." In this case, also involving homicidal ideations against a supervisor, the court maintained that "[w]hile [plaintiff] did not physically harm or directly threaten any individual, his admitted conduct did pose a threat to the physical safety of other USPS employees." The court held that "'[a]n agency . . . is not obliged to indulge a propensity for violence—even if engendered by a 'handicapping' mental illness—to the point of transferring potential assailants and assailees solely to keep peace in the workplace.'"

The foregoing examination indicates that, when the courts face cases involving genetic discrimination, they will be likely to find that an employer's adverse actions, based on the uncertain and unpredictable results of genetic tests, are violative of the rules and spirit of the ADA.
C. "Tails You Lose": Liability for Not Using Genetic Information

If an employer decides that it will not make use of the genetic information readily and cheaply available in the twenty-first century, it will be faced with the baffling flip-side of the Cassandra Complex—liability in tort for injuries caused by the manifestation of genetic conditions of which the employer should have been aware. Under the tort theories of negligent hiring, retention, and entrustment, employers are held directly liable for injuries to third parties caused by the acts of their employees, whether within or outside the scope of employment. Once again, there are no decisions that have attributed tort liability to an employer for the harmful manifestations of an employee's genetic condition. In order to forecast judicial reaction, however, one can look to tort cases involving an employee's violent criminal propensities and alcohol or drug addiction, both hidden, potentially destructive conditions.

The tort theory of negligent hiring creates a cause of action from the wrongful conduct of the employer in exposing third parties to a potentially dangerous employee. An employer can be liable for the torts of his employee beyond the scope of employment "where it knew or had reason to know of the [employee's] particular unfitness, incompetence or dangerous attributes . . . and could reasonably have foreseen that such qualities created a risk of harm to other persons." In Tallahassee Furniture Co. v. Harrison, the court upheld a personal injury suit

310. See 27 AM. JUR. 2D Employment Relationship § 472 (1996); see also Medina v. Graham's Cowboys, Inc., 827 P.2d 859 (N.M. Ct. App. 1992) (reviewing a personal injury complaint against a bar owner for the doorman's assault on a patron); Valdez v. Warner, 742 P.2d 517 (N.M. Ct. App. 1987) (remanding the case and holding that a bar owner may be liable for the injuries of a patron who was assaulted by a bar employee when employer had prior knowledge of employee's history of assaults); Garcia v. Duffy, 492 So. 2d 435 (Fla. Dist. Ct. App. 1986) (considering liability of employer when an employee with a known history of assault and battery and night-prowling attacked plaintiff).

311. Di Cosola v. Kay, 450 A.2d 508, 516 (N.J. 1982); see also Seariver Maritime, Inc. v. Industrial Med. Servs., Inc., 935 F. Supp. 1287, 1302 (N.D. Cal. 1997) (finding medical provider liable for negligent hiring of a doctor who failed to treat a sailor for an arm injury); Doe v. WTMJ, Inc., 927 F. Supp. 1428, 1433 (D. Kan. 1996) (declaring that "liability [for negligent hiring] turns on whether there are facts from which the employer knew or should have known of a particular dangerous proclivity of an employee followed by employee misconduct consistent with such dangerous proclivity by the employee") (quoting McNair v. Bunch, 891 S.W.2d 822, 825 (Mo. 1995)) (alterations in original); Patton v. Southern States Transp., Inc., 932 F. Supp. 795, 801 (S.D. Miss. 1996) (identifying the elements of negligent hiring cases); Garcia, 492 So. 2d at 435 (considering liability of employer when an employee with a known history of assault and battery and night-prowling attacked plaintiff); F & T Co. v. Woods, 594 P.2d 745, 747 (N.M. 1979) (finding that in order to be liable for employee's rape of customer, the employer must have been able to foresee that hiring the employee would constitute an unreasonable risk of injury to others).

brought by a customer who had been attacked by a furniture delivery-
man employed by the defendant company. Although the employee had
a lengthy criminal record, the employer's normal hiring documentation
and procedures failed to turn up the convictions. The court stressed the
need for an employer to conduct an independent investigation, particu-
larly in a situation where the employee is allowed to enter customers' homes. In a similar case, Ponticas v. K.M.S. Investments, a tenant sued the realty company that hired the manager who raped her. As in Tallahassee, the manager had a criminal record that had not been discovered through the employer's standard hiring process. The court stated that "[l]iability is predicated on the negligence of an employer in placing a person with known propensities, or propensities which should have been discovered by reasonable investigation, in an employment position in which . . . it should have been foreseeable that the hired individual posed a threat of injury to others." The court further determined that "[t]he scope of the investigation is directly related to the severity of risk third parties are subjected to by an incompetent employee." 

Although genetic predisposition does not carry with it the stigma of a prior criminal record, it is not difficult to foresee the liability of an employer who had easy access to records of an applicant's predisposition to mental illness or to other potentially dangerous conditions, and could have, therefore, reasonably foreseen the possibility of harm. If the predisposition becomes a reality, the door will be open to suits from

313. See id. at 747.
314. See id. at 749.
315. See id. at 751-52; see also Kendall v. Gore Properties, Inc., 236 F.2d 673, 678 (D.D.C. 1956) (finding employer negligence in the rape of a tenant by an employee when the employer knew that the employee was able to enter, after hours, the apartment of a young woman); Williams v. Feather Sound, Inc., 386 So. 2d 1238, 1240 (Fla. Dist. Ct. App. 1980) (finding that when a developer permitted an employee to have entry into townhouses, the developer was liable for not obtaining information regarding the employee's background).
316. 331 N.W.2d 907 (Minn. 1983).
317. See id. at 909.
318. See id. at 910.
319. Id. at 911.
320. Id. at 913. Courts appear somewhat conflicted over the amount and type of information that an employer should uncover to insure that an employee is capable of safely performing the job. The court in Edwards v. Robinson-Humphrey Co., 298 S.E.2d 600, 601 (Ga. App. 1982), held as sufficient the employer's standard process of hire, including several applications and a thorough background check. The court in Estate of Arrington v. Fields, 578 S.W.2d 173, 177 (Tex. Civ. App. 1979), insisted that the employer should have accessed the employee's criminal record from private investigative agencies. But see Cones v. Molalla Transp. Sys., Inc., 831 P.2d 1316, 1322 (Colo. 1992) (holding that an employer's duty of investigation in hiring truck drivers does not extend to conducting a search into an applicant's criminal history).
third parties arguing that the employer did not take sufficient investigative steps to prevent tortious injury caused by the employee’s illness. For example, an employer could be held responsible for the harm caused by an employee who was hired in a truck driver or security guard position if the employee’s genetic tests revealed a predisposition for diseases that cause lapses of consciousness or incapacity. In all cases, the employer’s ability to foresee injury to third parties, predicated by the frequency and manner of the employee’s contact with the public, will likely be a significant factor considered by the courts in assessing liability.\(^{321}\)

Negligent retention, a variant on the traditional tort of negligent hiring, is based on the theory that an employer has a continuing duty to retain only those employees who are fit and competent.\(^{322}\) While under the theory of negligent hiring the issue of liability turns on the adequacy of the employer’s pre-employment investigation, in negligent retention it depends on whether the employer becomes aware or should have become aware of problems with a current employee, yet fails to take further action.\(^{323}\) Additionally, an employer might be liable for negligent retention if “the employer reasonably should have foreseen that its precautions were inadequate to protect third parties from an unreasonable risk of harm resulting from a recurrence of the employee behavior of which the employer had prior notice.”\(^{324}\) In Favorito v. Pannell,\(^{325}\) the First Circuit reviewed the claim of negligent retention brought by a yacht’s passengers against the yacht’s owners for injuries caused by the reckless driving of the owners’ engineer.\(^{326}\) In determining the owner’s liability, the court maintained that the employer could be held liable if it “(1) had ‘reason to know of the particular unfitness, incompetence or dangerous attributes of the employee’ and (2) ‘could reasonably have foreseen that such qualities created a risk of harm to other persons.’”\(^{327}\)

The court held that “a negligent retention claim does not lie absent sufficient evidence . . . that the employer reasonably should have foreseen

\(^{321}\) See 27 AM. JUR. 2D Employment Relationships § 474 (1996). “The scope of the employer’s duty in exercising reasonable care in a hiring decision will depend largely on the anticipated degree of contact that the employee will have with other persons in performing his or her employment duties.” Id.

\(^{322}\) See id. § 476.

\(^{323}\) See Yunker v. Honeywell, Inc., 496 N.W.2d 419, 423 (Minn. Ct. App. 1993) (holding the employer liable for the murder of an employee by a co-worker where an employer had knowledge of the co-worker’s criminal propensity and retained him in his position).

\(^{324}\) 27 AM. JUR. 2D Employment Relationships § 476.

\(^{325}\) 27 F.3d 716 (1st Cir. 1994).

\(^{326}\) See id. at 718.

\(^{327}\) Id. at 719 (quoting DiCosala v. Kay, 450 A.2d’508, 516 (N.J. 1982)).
that its precautions were inadequate to protect persons . . . from an unreasonable risk of harm resulting from a recurrence of the employee behavior of which the employer had prior notice."\footnote{328}

The doctrine of negligent retention may be particularly pertinent for employers who may conduct routine genetic monitoring of employees in the workplace. According to this theory, once the employer is put on notice of an employee's condition or propensity, it may be liable for any subsequent injury to third parties caused by the employee's condition.

Negligent entrustment occurs "where the employer supplies an employee with a chattel knowing the employee to be likely . . . to use it in a manner involving unreasonable risk of physical harm to himself and others."\footnote{329} This theory of liability is often used in cases where the employer has allowed an incompetent employee to use a motor vehicle, causing subsequent injury to third parties.\footnote{330}

In \textit{Cherry v. Kelly Services, Inc.},\footnote{331} for example, an injured motorist sued the employer due to an accident caused by a temporary truck driver.\footnote{332} The court held: "The fact that [defendant] uncontrovertably
proved that it had no actual knowledge of any pattern of reckless driving by [the employee] does not mean that [it] carried its burden of proving that it exercised ordinary care."³³³ The court went on to explain that the employer must look into all available information in order to satisfy its burden of ordinary care.³³⁴ As with cases involving negligent hiring and retention, states vary as to the level of care needed to satisfy this burden.

In addition to liability toward third parties for injuries caused by an entrustee, an employer may be held liable for injuries caused to the entrustee himself. In Casebolt v. Cowan,³³⁵ the Supreme Court of Colorado held an employer liable for injuries sustained by an employee for allowing him to drive the company car while intoxicated.³³⁶ The court concluded that “the risk presented by the entrustment, or the continuation of an entrustment, of a vehicle to a person likely to drive it while inebriated is an unreasonable one.”³³⁷ If an employer has the ability to access genetic tests revealing a condition that might impact upon an employee’s driving abilities, it might be found negligent for failing to exercise its ordinary duty of care by not acting on the test results.

In light of the tort doctrines of negligent hiring, retention, and entrustment, it would seem that an employer may be held liable for its failure to act upon the results of genetic information, particularly in circumstances in which this information was readily accessible. Case law seems to indicate, therefore, that an employer may be liable under the ADA for acting on the results of an employee’s genetic test. Paradoxically, an employer will be held responsible under tort theories for not acting on the results of genetic tests. Caught in this no-win situation, an employer would reasonably look to both federal and state legislatures or to administrative regulatory agencies for guidance in solving the Cassandra Complex. Unfortunately, as previously examined, this guidance varies broadly from state to state, and Congress, to date, has failed to issue any legislation to assist the employer with this baffling dilemma.

VI. CONCLUSION

Caught between the increasing momentum of genetic research and the inertia of Congress, an employer must begin now to prepare for the

³³³. Id.
³³⁴. See id.
³³⁶. See id. at 360.
³³⁷. Id. at 362; see also Sanchez v. San Juan Concrete Co., 943 P.2d 571 (N.M. Ct. App. 1997) (declining employer’s motion for summary judgment in negligent entrustment action by employee for injuries incurred while driving company truck while intoxicated).
genetic information unleashed on the workplace. If an employer chooses to ignore the information, science and technology will continue to flood the market until it will no longer be financially and legally practical to do so. As Robert Oppenheimer declared in his testimony on the role of science in the development of the atom bomb: "'If you are a scientist, you cannot stop such a thing. If you are a scientist, you believe that it is good to find out how the world works; that it is good to find what the realities are; that it is good to turn over to mankind at large the greatest possible power to control the world.'" Whether one considers the Human Genome Project a "Pandora's box," or a "Holy Grail," its effects have only begun to impact upon industry.

An employer can begin to prepare for the future by understanding the balancing process needed to successfully navigate in the genetic workplace. In fashioning policies and procedures addressing genetic testing and discrimination, an employer can be guided by a set of generally applicable public policies drawn from existing legislation and basic societal morality.

One of the primary responsibilities for an employer is to ensure as far as possible a safe and productive work environment for all employees. Unfortunately, workers and their families have often been the first to subsidize new industrial processes with their health and even their lives. Protection of the worker may mean that an individual should not...
be assigned to a job if it is not possible to assure his own safety or the safety of others. In an open and mutual dialogue between management and workers, legitimate issues must be explored, including valid evaluations of the physical and mental requirements of jobs, and of the realistic potential harm for the worker and his offspring.

An employer must conscientiously try to identify the health dangers in its workplace, using available findings from other employers and governmental agencies. This information must be made clearly and completely available to workers to allow them the opportunity to determine whether a risk should or should not be assumed. Employers should notify applicants of all the possible risks inherent in the position they are seeking and that genetic susceptibility might increase their risk. The final choice regarding assumption of risk should remain with the employee or the applicant, unless co-workers or third parties will also share the risk. Employers should consult attorneys to assist them in the drafting of a waiver of responsibility should the worker decide to assume the risk despite the warnings of future potential harm. This will be particularly complicated in situations where the risk might involve future reproductive capacity or harm to a fetus.

In the best of circumstances, an applicant or employee would be referred to his or her own physician to assess genetic predisposition so that confidentiality could be preserved. The results of genetic analysis

344. See id. at 8 (statement of Ernest E. Dixon, Tabershaw Associates, Rockville, Maryland).
345. See id.; GSWIRTH, supra note 254, at 7.
346. See High-Risk Groups, supra note 46, at 17.
347. Mark A. Rothstein outlines six recommendations to minimize dangers of genetic hazards in the workplace:

(1) all employees subject to possible reproductive hazards must be informed in writing of the specific substances involved;
(2) employers must advise employees in writing of the possible short-term and long-term effects of exposure and provide them with available literature on the substances and the nature of the hazards;
(3) no employer may condition employment on the employee being sterilized;
(4) employers must make pregnancy and fertility testing available;
(5) medical removal protection must be provided for employees attempting to become parents, especially pregnant employees; and
(6) employers must make ongoing efforts to reduce exposure levels through improved control technologies, substitution of substances and better personal protection equipment.

Rothstein, supra note 32, at 1465 (footnotes omitted).

348. See Council, supra note 242, at 1829.
349. See id.; see also High-Risk Groups, supra note 46, at 9 (testimony of Ernest E. Dixon) ("I do not believe that workers should be permitted to assume the risk of bodily harm just because they are shielded from the risks of financial loss.").
350. See Council, supra note 242, at 1829.
conducted by employer-contracted physicians should be retained in a location other than the employer’s work site and should be destroyed immediately after their purpose has been accomplished.

If the employer decides to conduct genetic screening in the workplace, it must ensure that the tests utilized are safe, valid, and reliable. Occupational physicians must be instructed to make assessments based on testing measures that reliably predict the probability and extent of the harm foreseen. To avoid liability, occupational qualifications must be bona fide and reasonably related to performance on the job. Empirical data must be gathered to demonstrate that the genetic condition would expose the worker to an unusually elevated susceptibility to occupational injury or illness. Decisions based on stereotypes or presumptions are illegal, as are those based on racial, ethnic, or class based statistics. There must be an individualized assessment of each applicant or employee’s ability to perform the specific job with no harmful results.

The possibility of genetic testing must be disclosed to employees and applicants, and informed consent must be obtained before any testing occurs. The written authorization consenting to genetic screening must be drafted in language understandable to the worker and should contain a clear statement that all genetic testing and monitoring is voluntary. It should identify the specific genetic test to be conducted, the information that could be derived from the analysis, and the ways in which the genetic information will be used. Additionally, procedures for revocation of consent and destruction of genetic samples should be documented and discussed with the worker. Lastly, the employer should provide the services of a genetic counselor to the worker to discuss the meaning of the test results and to assist the worker with difficult moral

351. “Reliability” has been defined as “the degree to which a test consistently measures the same thing” and “validity” as “whether or not the test is measuring what you think it is measuring.” Genetic Screening of Workers, supra note 86, at 43. A technically valid genetic test must meet at least the following criteria: (a) it must be appropriately sensitive to the genetic trait or to the genetic damage and it must be appropriately specific for that trait or that damage; (b) there must be sufficiently high prevalence of the trait or of the damage in the population, in part to justify the cost of the testing program and in part to give the test an appropriately high predictive value; (c) there must be a significantly higher risk of those with the trait or the damage developing the illness than of those without the trait or damage developing the illness. See Baruch A. Brody, The Ethics of Genetic Testing in the Workplace, in 3 Genetic Monitoring and Screening in the Workplace 2 (1990).

352. See Council, supra note 242, at 1829.
353. See Genetic Screening of Workers, supra note 86, at 99.
355. See id.
and ethical choices including the communication of the genetic findings to his or her family.\textsuperscript{356}

Protecting employees from occupational injury may be achieved by offering workers the opportunity to be monitored for exposure to potential toxins and for adverse health effects from the toxins.\textsuperscript{357} If the tests indicate that the employee has exceeded the recommended exposure, the employee should be transferred to a safer job without loss of salary, benefits, seniority, or opportunities for advancement.\textsuperscript{358} In order to justify transferring a "hyper-susceptible" worker instead of reducing risks in the workplace for all workers, the employer would need to show that the costs of improving safety are extraordinary relative to other costs of production.\textsuperscript{359} An employer would be wise to establish procedures for resolving potential conflicts created by the transfer of a worker or the restructuring of positions if there is no formal avenue for grievance in its workplace.

Finally, the employer must analyze the provisions of the legislation of its particular state to ensure that its policies do not conflict with enacted laws regarding genetic testing in the workplace. Most importantly, through professional organization and in conjunction with organized labor, employers must lobby to ensure that adequate federal legislation and administrative guidelines are established to provide effective guidance to companies faced with ethical and legal dilemmas.

To avoid Cassandra's fate, employers will need to squarely face the economical, legal, and ethical ramifications of the Human Genome Project and, in conjunction with workers, forge a new understanding that will respect the privacy and autonomy of the worker as well as the rights of the employer to conduct its business safely and economically.

\textbf{POSTSCRIPT}

Since this Note was first written, many developments have occurred in the science and the politics of genetic testing. Below are a few highlights:

\textsuperscript{356} See id.
\textsuperscript{357} See Council, supra note 242, at 1829. In his testimony before the Subcommittee of Investigations and Oversight, Ernest Dixon, specialist in occupational medicine stated: "The benefits in worker health protection afforded by properly and fairly conducted health surveillance far outweighs any risk that discriminatory decisions might pose." High-Risk Groups, supra note 46, at 8-9. He added: "However, there are ethical and social dilemmas to be addressed. When it comes to a health problem of an individual posing a hazard to other individuals or property, there can never be a decision to accept the latter." Id. at 9.
\textsuperscript{358} See Council, supra note 242, at 1829.
\textsuperscript{359} See id.
FEBRUARY 3, 1998: The Ninth Circuit Court of Appeals reversed a summary judgment motion granted to the Lawrence Berkeley Laboratories in a suit by current and former administrative and clerical employees.\textsuperscript{360} The employees alleged that in the course of their mandatory employment entrance examinations and without their knowledge or consent, Lawrence tested their blood and urine for "intimate medical conditions"—specifically, syphilis, sickle cell trait, and pregnancy.\textsuperscript{361} In a decision that may have a significant impact on genetic testing in the workplace, the court held that the fact that employees signed medical releases authorizing the collection of blood and urine did not imply their consent to "investigate the most intimate aspects of [their lives]."\textsuperscript{362} Concluding that there are "few subject areas more personal and more likely to implicate privacy interests than that of one's health or genetic make-up,"\textsuperscript{363} the court remanded the case to the district court for adjudication.\textsuperscript{364} The Lawrence Berkeley Laboratory, funded through the DOE, is one of the National Laboratories involved in research for the Human Genome Project.\textsuperscript{365}

MAY 9, 1998: Dr. Craig J. Venter, President of the non-profit Institute for Genomic Sciences in Rockville, Maryland, and Michael W. Hunkapiller, President of the Applied Biosystems division of the Perkins-Elmer Corporation of Norwalk, Connecticut, announced that they were joining forces with the aim of deciphering the entire human genome within three years, far faster and cheaper than the federal Human Genome Project.\textsuperscript{366} Ethicist Dr. Arthur Caplan of the University of Pennsylvania\textsuperscript{367} commented: "The question is, can the moral and legal questions be addressed if the largest scientific revolution of the next century is going to be done under private auspices?"\textsuperscript{368}

MAY 21, 1998: In testimony before a Senate committee, Senator Pete Domenici said that Congress would be "irresponsible" by not making progress in protecting individuals from misuse of their personal genetic information.\textsuperscript{369} Senator Domenici, the author of the Genetic

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\textsuperscript{360} See Norman-Bloodsaw v. Lawrence Berkeley Lab., 135 F.3d 1260 (9th Cir. 1998).
\textsuperscript{361} See id. at 1264.
\textsuperscript{362} Id. at 1268.
\textsuperscript{363} Id. at 1269.
\textsuperscript{364} See id. at 1275-76.
\textsuperscript{365} See How Big, HOW FAST?, supra note 106, at 100.
\textsuperscript{366} See Nicholas Wade, Scientist's Plan: Map All DNA Within 3 Years, N.Y. TIMES, May 10, 1998, at 1.
\textsuperscript{367} See id.
\textsuperscript{368} Id.
Confidentiality and Nondiscrimination Act of 1997, testified on stalled efforts in Congress to ensure privacy rights for individual genetic information. Senator Domenici commented: ""The Human Genome Project stands to be one of our greatest scientific and medical achievements. But its wonderful promise may never be fully realized if the public is afraid of what someone else will do with their information . . . .""370

JUNE 3, 1998: At a meeting in Warrentown, Virginia, the NIH and the DOE unveiled their new five year draft plan for the Human Genome Project, emphasizing that the ELSI planning group will be charged with analyzing and addressing ""the implications of completing the first human genome sequence and identifying variation.""371 Additionally, the NIH and DOE in the draft committed to exploring ""how new genetic knowledge challenges or affirms long-standing philosophical and theological traditions.""372

JUNE 8, 1998: The DOE's Human Genome Project funded the Chicago Judicial Conference for Genetics in the Courtroom, to educate judges in preparation for "cases brought because of the Human Genome Project."373 Dr. Franklin M. Zweig, president of the Einstein Institute commented that because Congress and the states had failed to enact anti-discriminatory legislation, ""the judicial branch of government will bear the primary responsibility when the law and science intersect.""374 Dr. Daniel W. Drell, director of the ELSI Program of the Human Genome Project stated: ""The trend is clear that a lot of these kinds of cases are headed toward the courts . . . .""375

SEPTEMBER 3, 1998: The Labor-HHS-Education spending bill allocated $250 million in funding in fiscal year 1999 for the National Human Genome Research Institute, a further increase from the 1998 appropriation level of $217 million.376

SEPTEMBER 14, 1998: Leaders of the worldwide Human Genome Project announced a sharp acceleration in the Project's schedule, agreeing to complete a "rough draft" in three years and a definitive map by

370. Id.
372. Id.
373. Patricia Manson, Judges Huddle over the Future: Gene-Based Law, CHI. DAILY L. BULL., June 8, 1998, at 1.
374. Id.
375. Id.
In addition to shortening their timetable, gene researchers added another goal: "They will begin compiling a detailed catalogue of genetic variations among people, another endeavor where private companies had threatened to leapfrog publicly funded researchers." This database will help reveal "why some people are smarter than others, why some are tall and some are short, why some run fast and others play a mean game of chess, why some get cancer and others get depressed, why some die young and others live to a ripe old age." This new timetable, if adhered to will provide the publication of the first gene map in 2003, exactly fifty years after James Watson and Francis Crick described the fundamental structure of DNA.

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378. Id.
379. Id.
380. See id.

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