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SCIENCE TESTS HUMAN DIGNITY: THE CHALLENGES OF GENETIC ENGINEERING

John B. Attanasio*

THE issues involving the genetic revolution go to the heart of human dignity. The regulatory approach to genetic engineering in the German and American systems have been sharply contrasting. The European Union and Germany, in particular, have displayed a marked skepticism toward genetic engineering.¹ The United States, on the other hand, has engaged in very little regulation.²

The United States Constitution does not have a human dignity clause. The Supreme Court has occasionally tried to add something like this, using the theory of substantive due process, which is primarily invoked to support a woman's right to have an abortion.³ This concept of substantive due process, though controversial, means that the government cannot take a particular action, regardless of the process it follows, if that action would undercut fundamental traditions of Anglo-American jurisprudence.⁴

In *Saenz v. Roe*,⁵ decided in 1999, the Court tried to revive the much neglected Privileges and Immunities Clause of the Fourteenth Amendment, which says that the government cannot abridge certain privileges and immunities that are considered inherent to being a citizen of the United States. The *Saenz* case is a rare example of the Court using the Privileges and Immunities Clause of the Fourteenth Amendment.

No technology in the immediate future will cause more controversy about the concept of human dignity than genetic engineering, particularly

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1. See Stevan M. Pepa, *International Trade and Emerging Genetic Regulatory Regimes*, 29 LAW & POL'Y INT'L BUS. 415, 439, 446-47 (1998).

2. See generally Marsha A. Echols, *Food Safety Regulation in the European Union and the United States: Different Cultures, Different Laws*, 4 COLUM. J. EUR. L. 525 (1998) (explaining the markedly different regulatory approaches in the European Union and the United States).

3. See Anne Lawton, *The Frankenstein Controversy: The Constitutionality of a Federal Ban on Cloning*, 87 KY. L.J. 277, 351 (1999).

4. See, e.g., *Palko v. Connecticut*, 302 U.S. 319 (1937). Different supreme court opinions express the idea of substantive due process in different ways.

5. 526 U.S. 489 (1999).

human genetic engineering. Rapid and unimaginable changes are occurring in this area. A few short years ago, the world changed when it discovered that scientists had cloned a sheep named Dolly; that is, they produced a sheep asexually. Recently scientists have found that the cloned sheep might age more quickly than the original copy.⁶ Whether this would be true if they cloned an embryo, rather than an adult sheep, is uncertain. More recently, scientists cloned mice and cows. The mice were cloned in Japan.⁷

There are reports of scientists cloning a human embryo, but not implanting it into a woman's womb.⁸ For many years now, there have been discussions about cloning human embryos and developing an exact copy of each of us, which could be preserved in a frozen state and serve as a perfect organ donor. After all, the organs would not be rejected and would be readily available. But what are the ethics of this idea? What are the implications for human dignity? Does the clone have any rights? Is she a human being or just a piece of property? Perhaps less problematically, scientists could clone individual organs using stem cells—cells which have not yet had the chance to differentiate themselves into specific uses or organs.⁹ About two years ago, scientists isolated stem cells and got them to grow into neural, gut, muscle, and bone cells.¹⁰ While controversy swirls around the problem that stem cells come from aborted embryos, scientists are trying to develop alternative sources.¹¹

Separate problems are caused by transgenetic beings. Scientists are already experimenting with inserting human genes into mice in order to determine the effect of an isolated human gene causing some kind of disorder.¹² What is the morality of combining human genetic materials with that of other creatures? Even if one gene or a few genes are acceptable, what about inserting many genes? What about purposefully creating transgenetic creatures which have certain human genes and certain ape genes to make them somewhat more intelligent than apes, and considerably stronger than humans? Suppose these beings were soldiers designed for war? Even if some countries shun such practices, what about totalitarian regimes who might leap at such a prospect? What about the process of aging? Scientists may be able to arrest this process by certain

6. See Nic Robertson et al., *Scientists: Cloned Sheep Dolly Has "Old" DNA*, CNN INTERACTIVE (visited May 26, 1999) <<http://www.cnn.com/nature/9905/26/dolly.clone.02/index.html>>.

7. See David Derbyshire, *The Calves Cloned From a Pint of Milk: Made in Japan, the Latest Breakthrough in Genetic Engineering*, DAILY MAIL (London), Apr. 27, 1999, at 19.

8. See Renee C. Esfandiary, *The Changing World of Genetics and Abortion: Why the Women's Movement Should Advocate for Limitations on the Right to Choose in the Area of Genetic Technology*, 4 WM. & MARY J. WOMEN & L. 499, 502 (1998).

9. See Don Knapp, *Cell Scientists Hope to Grow Human Spare Parts*, CNN INTERACTIVE (visited May 22, 1999) <<http://www.cnn.com/health/9905/22/organs.to.grow/>>.

10. See Michael D. Lemonick et al., *On the Horizon*, TIME, Jan. 11, 1999, at 89.

11. See *id.*

12. See Dan Vergano, *Of Transgenic Mice and Men: Human Touch Turns Rodents into Pioneers of Medical Research*, USA TODAY, May 25, 1999, at 11D.

genetic manipulations.¹³

Germany and the United States have dramatically different approaches to the entire arena of genetic engineering. Germany and the European Community have taken a far more cautious approach, banning foodstuffs which are the product of genetic engineering.¹⁴ Currently, virtually the only genetic engineering regulations in the United States concern health and safety and are promulgated by organizations like the Food and Drug Administration and the Environmental Protection Agency.¹⁵ There are also experimentation protocols imposed by the National Institutes of Health, which are mandatory if government money is used.¹⁶

The Supreme Court of the United States has held that genetically transformed animals are patentable¹⁷ and the United States Patent Office, in fact, does grant patents in newly created living organisms.¹⁸ Will the Patent Office eventually give patents over human beings? What about the blood that flows in a person's veins? If a hospital uses my blood to make some new drug, does the hospital have a property right in that new substance, or do I have a property right because it was my blood?¹⁹

The most controversial of all genetic technologies is recombinant DNA, which involves changing the genetic code to create new human beings.²⁰ Scientists recently completed a complete map of the human genome, which provides a major step forward to do gene splicing and other sorts of genetic manipulation.²¹ Scientists already can perform some processes whereby they can extract a strand of genetic material from one being and inject new genetic material in its place.²² They are already doing some recombinant DNA to cure diseases.²³ This application is generally called negative genetic engineering.²⁴ More controversial is using recombinant DNA technology to develop such desired traits as beauty, intelligence, strength, and stamina. This use is sometimes called positive genetic engineering.²⁵ If performed in embryos, such

13. See Lemonick et al., *supra* note 10.

14. See Bill Hord, *Today's High-Tech Harvest Farms and Ranches at the End of the 20th Century Have Evolved into High-Tech Businesses Relying as Much on Computers and Biogenetics as the Machinery Turning the Soil: Agricultural Milestones, a Century of Agricultural Evolution Glossary*, OMAHA WORLD-HERALD, May 24, 1999, at 1.

15. See Curtis A. Kin, *Coming Soon to the "Genetic Supermarket" Near You*, 48 STAN. L. REV. 1573, 1580 (1996).

16. See *id.* at 1578.

17. See Esfandiary, *supra* note 8, at 504; see also *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

18. See Paul Blunt, *Selective Breeding and the Patenting of Living Organisms*, 48 SYRACUSE L. REV. 1365, 1370 (1998).

19. See *Moore v. Regents of the Univ. of Cal.*, 793 P.2d 479 (Cal. 1990).

20. See Kin, *supra* note 15, at 1581-82.

21. See Brian C. Cunningham, *Impact of the Human Genome Project at the Interface Between Patent and FDA Laws*, 7 RISK: HEALTH SAFETY & ENV'T 253 (1996).

22. See Vergano, *supra* note 12.

23. See Lemonick et al., *supra* note 10.

24. See Esfandiary, *supra* note 8, at 501.

25. See *id.* at 502.

processes can affect the germ line and be inheritable, dredging up frightening memories of eugenics. Expense amplifies prospects for master classes, or indeed races. While such problems particularly infect germ line manipulations, distributive concerns pervade all of these expensive genetic technologies. Insurance may not cover many of these costly procedures. Indeed, the spotting of adverse genetic traits—such as a propensity for heart disease—may undercut a particular individual's insurability or employability.²⁶

Scientists caution that the possibility of manipulating complex, polygenic traits such as intelligence remains far off in the future. However, developments in this area generally are kept secret, in part, to avoid the controversy they generate. Developments are also kept secret because the basic way to protect developments in their early stages is by trade secrets. The problem with this approach is that the law will play no role in the discourse if judges and lawyers simply wait until the developments are upon us. Lawyers must become better trained in science, or technocracy and laissez-faire market mechanisms may supplant the rule of law and democracy.

Lawyers must also learn to think proactively by mapping out futuristic scenarios upon which to analyze possible regulatory schemes. Imagine the following hypothetical: suppose a drug company discovers a new drug called *genos*, which can be used to develop stronger, more intelligent human beings. The method of using the drug involves a series of complex surgical procedures. Researchers begin by extracting an egg from a woman and fertilizing it *in vitro*. They proceed through micro-injection to manipulate pharmacologically the genetic structure of the fertilized egg. The egg is then inserted back into the uterus where it develops until the woman gives birth.

Subjects of the *genos* experiments have been many times stronger—in both immediate strength and stamina—than the average human being of their sex, and have had I.Q.s well above genius level. It is undisputed that the drug is completely safe to use and poses no undesirable side effects to the mother or to the resulting fetus or child at any stage of development. Finally, suppose scarcity of the raw materials necessary to manufacture the drug will limit *genos* births to approximately 15,000 per year. Based on natural scarcity, high production costs, and high surgical costs, the drug company estimates that the price of having a *genos* child will be \$370,000. The paucity of raw materials needed to produce *genos* will increase the price of the drug for the foreseeable future. Under pressure from citizens who cannot afford the drug, Congress considers the policy merits and constitutionality of a ban on the manufacture of

26. See John B. Attanasio, *The Genetic Revolution: What Lawyers Don't Know*, 63 N.Y.U. L. REV. 662 (1988).

genos.²⁷

The *genos* hypothetical holds in tension the foundational, constitutional ideas of liberty and equality. The basic question must be whether the United States Constitution affords parental choice to bear children whose traits are enhanced by positive genetic engineering.

The starting point for addressing this question in America must be the fundamental right to choose an abortion. Of course, the argument hinges on the precise scope or breadth of the right guaranteed.²⁸ Is it a right to choose an abortion or a broad right of procreative liberty? In addition, current American jurisprudence arguably permits considerable genetic engineering, as for quite some time during the pregnancy, it allows abortion for any reason whatsoever. As science can already spot a number of undesirable or negative genetic traits, considerable genetic engineering is already allowed by means of abortion.²⁹

On the positive genetic engineering side, science can already spot gender early during pregnancy, which has generated controversy in the U.S. as some data indicates that couples are opting for male children.³⁰ As the vision of science grows more acute, the right to choose an abortion will increasingly permit parents greater latitude in choosing desirable or positive genetic traits.

Indeed, the problems sparked by the *genos* hypothetical are already upon us. For several years, controversy already has swirled around growth hormone: who can use it and who pays for it, because it is expensive. At what height is curing an undesirable trait, like shortness, really negative engineering and at what height does such manipulation become positive genetic engineering?³¹

To regulate genetic engineering, some international consensus must be achieved. The systems are far apart on these pressing issues, and the economic incentives against regulation are large. All of life will be impacted. Huge fortunes are at stake; and so is all of existence as we have known it.

27. I first presented the *genos* hypothetical in an article over a decade ago. See John B. Attanasio, *The Constitutionality of Regulating Human Genetic Engineering: Where Procreative Liberty and Equal Opportunity Collide*, 53 U. CHI. L. REV. 1274, 1278 (1986).

28. Lawton, *supra* note 3, at 332.

29. For an extensive discussion of the issues presented by the *genos* hypothetical, see Attanasio, *supra* note 26.

30. See Lee M. Silver, *A Quandary that Isn't: Picking a Baby's Sex Won't Lead to Disaster*, TIME, Sept. 21, 1998, at 83; see also Abigail Trafford, *Is Sex Selection Wise?*, WASHINGTON POST, Sept. 22, 1998, at Z6.

31. See Kin, *supra* note 15, at 1573.

