

VIEWS OF CLONING FROM A PHYSICIAN'S PERSPECTIVE

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By way of introduction, I would like to acknowledge that the symposium held by the *NYU Journal of Legislation and Public Policy* was well organized and provided a great deal of cutting-edge information. This audience consists of the most informed people in the United States, if not the world, on the issue of cloning. This distinguished panel has explored more information in a couple of hours than many people who are making decisions in this arena have explored in a lifetime. As a practicing physician who constantly deals with these issues, I hope to contribute a medical perspective. People in many different fields, such as the sciences, molecular biology, law, politics, education, and philosophy, are grappling with the complex ethical dilemmas that arise when dealing with the germ plasm¹ of the human race.

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1. The term “germ plasm” was first used by August Weismann. See AUGUST WEISMANN, *THE GERM-PLASM: A THEORY OF HEREDITY* 37 (W. Newton Parker & Harriet Rönnfeldt trans., 1893); Mike Morrison, *Germ Plasm*, Roth Labs, Fred Hutchinson Cancer Research Center, at <http://www.fhrc.org/labs/roth/progrerm.html> (last updated Mar. 28, 1998).

The term “germ plasm” was first used in 1892 to describe the hereditary material passed from one generation to the next. Now substantially modified in definition, “germ plasm” is used to describe material which is visible in the germline of some animals and might play a role in germ cell specification, differentiation, or some other aspect of germ cell function. Even though the list of germ plasm components is growing rapidly, and the connection between germ plasm and germ cell function is growing stronger, it is not clear how the complex or any single component functions in germ cell biology.

Id. See also *Germ-Plasm Theory*, ENCYCLOPEDIA BRITANNICA, at <http://www.britannica.com/bcom/eb/article/5/0,5716,37265+1+36557,00.html?query=germ%20plasm> (last visited Oct. 22, 2000).

According to [Weismann's] theory, germ plasm, which is independent from all other cells of the body (somatoplasm), is the essential element of germ cells (eggs and sperm) and is the hereditary material that is passed from generation to generation Although the details of the germ-

Those in the field of science are learning more about germ plasm as we speak,² and their discoveries will lead to many new debates. Scientists are currently learning about human DNA through the Human Genome Project,³ which is ahead of schedule and under budget,⁴ and consists of the mapping of the entire human genome.⁵ The Project's revelations are being put on the Internet and are the property of the world.⁶ As a result, geneticists worldwide are getting new information daily about what constitutes the recipe of human life.⁷

The human genome project raises many questions. How will your genetic map be used? Will it be used to exclude you from insurance? Will it be used to exclude you from employment? Although these important issues are not the subject of this conference, they are

plasm theory have been modified, its premise of the continuity of hereditary material is the basis of the modern understanding of the process of physical inheritance.

Id. See also, e.g., *Germ Plasm Theory*, at <http://www.xrefer.com/entry/344018> (last visited Oct. 21, 2000) ("The germ plasm theory, correct in essence but not in detail, was the precursor to the gene theory and set the scene for it by producing an intellectual environment which was ripe for the acceptance of Mendel's work on genetics, published in 1866 but overlooked until 1900."); Note, *Patenting Human Beings: Do Sub-Human Creatures Deserve Constitutional Protection?*, 15 AM. J.L. & MED. 461, 471 (1989) (describing Congressional efforts to create a "national germ plasm bank.").

2. See, e.g., Mark Van Doren et al., *HMG-CoA Reductase Guides Migrating Primitordial Germ Cells*, 396 NATURE 466, 466-69 (1998); *Lab Overview*, Roth Lab, Fred Hutchinson Cancer Research Center, at <http://www.fhcrc.org/labs/roth/overview.html> (last updated Mar. 28, 1998).

3. See generally THE HUMAN GENOME PROJECT AND THE FUTURE OF HEALTH CARE (Thomas H. Murray et al. eds., 1996) [hereinafter THE HUMAN GENOME PROJECT] (investigating dramatic impact Human Genome Project will have on medicine and health care).

4. See ALLEN BUCHANAN ET AL., FROM CHANCE TO CHOICE 5-6 (2000); Clive Cookson, *The Human Genome: Surprise at Speed of the Robot Code Crackers*, FIN. TIMES, June 27, 2000, at 15; Peter Gorner, *DNA's Map Completed: How Genes Interact Still a Puzzle*, CHI. TRIB., June 27, 2000, at 1; Nicholas Wade, *Double Landmarks for Watson: Helix and Genome*, N.Y. TIMES, June 27, 2000, at F5.

5. *Human Genome Project*, Division of Extramural Research, National Institutes of Health, at <http://www.nhgri.nih.gov/HGP/> (last modified Oct. 18, 2000). For a discussion of the impact of the mapping of the human genome, see Albert R. Jonsen, *The Impact of Mapping the Human Genome on the Patient-Physician Relationship*, in THE HUMAN GENOME PROJECT, *supra* note 3, at 1-19.

6. Tom Abate, *UC Santa Cruz Puts Human Genome Online*, SAN FRAN. CHRON., July 7, 2000, at A2; Tom Abate, *Seeing Green in Genes*, SAN FRAN. CHRON., Aug. 28, 2000, at B1.

7. See Jeff Miner, *Beyond the Genome*, THE FUTURIST, Sept. 1, 2000, at 12; Andy Coghlan & Nell Boyce, *The End of the Beginning: The First Draft of the Human Genome Signals a New Era for Humanity*, NEW SCIENTIST, July 1, 2000, at 4; Michael D. Lemonik, *The Genome is Mapped. Now What?*, TIME, July 3, 2000, at 24.

nevertheless important considerations. The very fact that such information is available and that scientists can transmit DNA on the back of a virus into a human being through gene therapy, thereby changing one's genetic constitution, exemplifies why this is incredible technology.⁸ This technology is not that dissimilar from the new technologies dealing with cloning.

Cloning debates go beyond dealing with the nuclear cell; rather, they focus on the process of taking the cell and genetically engineering it before it is implanted. This is very different from merely taking normal tissues and putting them in a new conveyance. There are many ways to do this. One is by changing the tissue along the lines discussed earlier in the symposium. Another is that you now can have a genetic pool from only one individual of a couple.⁹ You are not taking genetic tissue from two parties, as is traditionally done. Furthermore, there is research going on that would even make it conceivable to incubate that fertilized gamete outside of the human body.¹⁰ While this may sound like science fiction, it is already being researched.¹¹ As one of the earlier speakers suggested, the issues of today were barely considered thirty years ago.¹²

Several bills have been introduced in Congress that propose banning cloning itself or prohibiting federal funds for cloning technology.¹³ One such bill proposed an outright ban on cloning,¹⁴ while

8. For a complete discussion of how gene therapy uses viruses to deliver cloned genes into the body, see ADENO-ASSOCIATED VIRUS (AAV) VECTORS IN GENE THERAPY (K.I. Berns & C. Giraud eds., 1996); MOLECULAR BIOTECHNOLOGY: PRINCIPLES AND APPLICATIONS OF RECOMBINANT DNA 403-19 (Bernard R. Glick & Jack J. Pasternak eds., 1994); STEM CELL BIOLOGY AND GENE THERAPY 235-50 (Peter J. Quesenberry et al. eds., 1998). For a layperson's discussion of gene therapy see Susan Ferraro, *Promise & Peril: Clinical Tests Stir Up Doubt*, DAILY NEWS, June 4, 2000, at 24.

9. This process, known as somatic cell nuclear transfer (SCNT), removes the nucleus of an unfertilized egg and replaces it with the nucleus of a somatic cell. The resulting offspring will contain genetic material identical to the somatic cell donor. Leon R. Kass, *Why We Should Ban the Cloning of Human Beings*, 4 TEX. REV. L. & POL. 41, 41-42 (1999); Peggy Scheckel, *The Prospect of Cloning Human Beings: Has Knowledge Leapt Ahead of Wisdom?*, 2 DEPAUL J. HEALTH CARE L. 605, 609 (1999).

10. See, e.g., *First Mammal Born From Lab-Grown Egg Cell*, SCIENCE NEWS, Jan. 27, 1996, at 54.

11. Sabra Chartrand, *A Company May be Moving Beyond Science Fiction and Toward the Cloning of Human Cells*, N.Y. TIMES, June 26, 2000, at C13; see generally GINA KOLATA, CLONE: THE ROAD TO DOLLY, AND THE PATH AHEAD 71 (1998).

12. See Frank P. Grad, Comments at the New York University Journal of Legislation and Public Policy Symposium, *Legislating Morality: The Debate over Human Cloning* (Nov. 19, 1999) (transcript on file with the *New York University Journal of Legislation and Public Policy*).

13. See Gregory J. Rokosz, *Human Cloning: Is the Reach of FDA Authority Too Far a Stretch?*, 30 SETON HALL L. REV. 464, 483-91 (2000) (describing legislative

another proposed a moratorium on federal funding of human cloning research so that an ethical discussion could occur.¹⁵ To date, the only federal restriction on cloning remains President Clinton's moratorium on the use of federal funds.¹⁶

There are some extremely valuable advantages to cloning. For example, approximately four thousand people die every year in this country waiting for heart, liver, and other organ transplants.¹⁷ The President's funding moratorium led to a raging debate as to whether the order banned any genetic engineering or reproductive research, which in turn highlighted the importance of stem cell research.¹⁸ There was a concern that the prohibition would stop stem cell research focused on reproduction of organs.¹⁹ The idea of being able to grow a liver or a heart is a fascinating and alluring possibility. In the end, this type of research continued despite the prohibition of federal funds.²⁰

One other cloning quandary is squarely a medical issue. As once was with anesthesiology, today obstetrics and gynecology are almost uninsurable specialties because no matter what a physician does, it

response to cloning); Heidi Forster & Emily Ramsey, *Legal Responses to the Potential Cloning of Human Beings*, 32 VAL. U. L. REV. 433, 434-41 (outlining nine separate bills introduced in Congress to limit or ban use of cloning technology or to prevent federal funding of research related to cloning).

14. H.R. 923, 105th Cong. (1997), *microformed on* CIS No. 98-H701-14 (Cong. Info. Serv.).

15. S. 368, 105th Cong. (1997), *microformed on* CIS No. 98-H701-14 (Cong. Info. Serv.).

16. President's Remarks Announcing the Prohibition on Federal Funding for Cloning of Human Beings and an Exchange with Reporters, 33 WEEKLY COMP. PRES. DOC. 278-79 (Mar. 4, 1997); *see also* Forster & Ramsey, *supra* note 13, at 435; William Neikirk, *No U.S. Funds for Human Cloning: Clinton Also Asks Private Sector Labs to Shelve Research*, CHI. TRIB., Mar. 5, 1997, at 3.

17. Eileen Smith, *Outreach for Organs* (May 31, 2000), at <http://www.drkoop.com/news/policy/stories/hamlett.html>. For statistics on the average number of patients awaiting organ transplants, see *All About Organ Donation*, at http://www.drkoop.com/conditions/organ_donation/page_31_304.asp (last reviewed June 1998).

18. *See* Christine Gorman, *To Ban or Not to Ban? The Report of a Presidential Commission Sets the Stage for a National Debate on Human Cloning*, TIME, June 16, 1997, at 66.

19. *See* Jerome P. Kassirer & Nadia A. Rosenthal, *Should Human Cloning Research Be Off Limits?*, 338 NEW ENGL. J. MED. 905-06 (1998); Rick Weiss, *Ban on 'Stem Cell' Testing Reviewed: At Senate Hearing, Advocates Offer Evidence of Research's Medical Promise*, WASH. POST, Dec. 3, 1998, at A2.

20. Gina Kolata, *Speed of Cloning Advances Surprises U.S. Ethics Panel*, N.Y. TIMES, Dec. 17, 1998, at A12; Hanna Rosin, *Outside Laboratory, Moral Questions: Abortion Foes Oppose Embryo Research*, WASH. POST, Nov. 6, 1998, at A14; David L. Wheeler, *Advances in Cell Biology Fuel a New Debate Over Ethics*, CHRON. HIGHER ED., Dec. 4, 1998, at A17.

may be proven to the satisfaction of a jury that the act was wrong.²¹ For example, if one allows a natural birth to occur and there is an untoward effect, a jury may reasonably find that one should have done a Caesarian section. If one does a Caesarian section and an untoward effect occurs, a jury may conclude that one should have waited for a natural delivery. It seems that juries conclude that no neurological impairment to an infant is ever a natural event; it is always the consequence of a flawed delivery.²² From this natural reproductive example, we can extrapolate and see implications of cloning technologies in the future.

In the cloning realm, juries will have new questions to answer: What are the legal implications in terms of deciding what constitutes improper fertilization? Was it improper genetic engineering? Was it improper delivery of the final gestational product? Due to the fact that we live in a society that expects compensation for what is perceived to be an injury, there are new consequences that require enormous ethical, medical, legal, and philosophical debate.²³

How will future attorneys and future physicians and molecular biologists deal with these issues? Have we begun to tamper beyond what society is ready to accept?

In closing, from a physician's viewpoint, law is a field deserving consummate respect because it is the bedrock of society. The attack on the legal profession in the media denigrates every profession. Without the law, there's no basis for civilized society, and whenever doctors downgrade the law they also denigrate medicine.

21. See generally Sheila Anne Feeney, *A Revolution in Anesthesiology is Making for Smooth Operations*, DAILY NEWS, May 15, 2000, at 63 (describing how anesthesia has undergone "safety revolution," as evidenced by "falling rate of malpractice insurance for what was an almost uninsurable specialty.").

22. For a real life story with similar facts, but involving a settlement, see Andrew Park, *Austin Patient Settles in Childbirth Lawsuit: Woman Says Doctor's Deciding Against Cesarean Delivery Caused Her Son's Brain Damage*, AUSTIN-AMERICAN STATESMAN, July 16, 1999, at B9, available at 1999 WL 7419173.

23. See, e.g., Virginia Morell, *A Clone of One's Own: Human Cloning*, 19 DISCOVER, May 1998, at 82.

